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Report of the Public Lands Commission, created by the Act of March 3, 1879, relating to public lands in the western portion of the United States and to the operation of existing land laws

46TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. No. 46.

REPORT

OF THE

PUBLIC LANDS COMMISSION,

CREATED BY

THE ACT OF MARCH 3, 1879,

RELATING TO

PUBLIC LANDS IN THE WESTERN PORTION OF THE UNITED STATES AND TO THE OPERATION OF EXISTING LAND LAWS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1880.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

The report of the Public Land Commission under the act approved March 3, 1879.

FEBRUARY 25, 1880.—Ordered to be printed.

To the Senate and House of Representatives:

I have the honor to transmit herewith a preliminary report and a draft of a bill submitted by the Public Land Commission authorized by the act of Congress approved March 3, 1879.

The subject of the report and of the bill accompanying it is of such importance that I respectfully commend it to the prompt and earnest consideration of Congress.

R. B. HAYES.

EXECUTIVE MANSION, *February* 25, 1880.

DEPARTMENT OF THE INTERIOR,
Washington, February 24, 1880.

SIR: I have the honor to transmit herewith for submission to Congress the preliminary report of the Public Land Commission, appointed the 1st July last under the sundry civil appropriation act of 3d March last (20 Stat., 394), with the accompanying documents.

Very respectfully,

C. SCHURZ,
Secretary.

The PRESIDENT.

PRELIMINARY REPORT

OF THE

PUBLIC LAND COMMISSION

TO THE

SENATE AND HOUSE OF REPRESENTATIVES.

To the Senate and House of Representatives of the United States:

The act of March 3, 1879, making appropriation for the sundry civil expenses of the government for the fiscal year ending June 30, 1880, contains the following clauses:

For the expense of a commission on the codification of existing laws relating to the survey and disposition of the public domain, and for other purposes, twenty thousand dollars:

Provided, That the commission shall consist of the Commissioner of the General Land Office, the Director of the Geological Survey, and three civilians, to be appointed by the President, who shall receive a per diem compensation of ten dollars for each day while actually engaged, and their traveling expenses; and neither the Commissioner of the General Land Office nor the Director of the Geological Survey shall receive other compensation for their services upon said commission than their salaries respectively, except their traveling expenses while engaged on said duties; and it shall be the duty of this commission to report to Congress within one year from the time of its organization: first, a codification of the present laws relating to the survey and disposition of the public domain; second, a system and standard of classification of public lands, as arable, irrigable, timber, pasturage, swamp, coal, mineral lands, and such other classes as may be deemed proper, having due regard to humidity of climate, supply of water for irrigation, and other physical characteristics; third, a system of land-parceling surveys adapted to the economic uses of the several classes of lands; and, fourth, such recommendations as they may deem wise in relation to the best methods of disposing of the public lands of the western portion of the United States to actual settlers.

In conformity with the foregoing clauses a commission was appointed, consisting, besides the *ex officio* members named in the act, of Mr. Thomas Donaldson, of Philadelphia, Pa., Mr. A. T. Britton, of Washington, and Mr. John W. Powell, of Illinois. It was duly organized at Washington on July 8, 1879, and it now has the honor to submit a preliminary report.

In laying out its work a careful consideration of the above provisions of law led to a subdivision of the work into two principal parts. First, a codification of the present laws relating to the survey and disposition of the public domain; second, investigation looking to recommendations of new legislation.

I.—Codification.

From the context of this act of Congress doubt has existed whether the term "codification" was intended to be used in the strict sense, and to require the draughting in one system of the whole law expressed in general principles deduced from the pre-existing statutes and from the adjudications of courts and the executive departments; or whether it was intended to have presented in an orderly arrangement a consolidation of the existing statute law, with references to decisions explaining and expounding the same. In either sense, however, very extended professional labor will be required to fairly perform this part of the duty of the commission. The assistance furnished by title 32 of the Revised Statutes of the United States is limited, because the compilers were in terms restricted to statutes "general and permanent in their nature," while the duty of this commission was extended to all "existing laws relating to the survey and disposition of the public domain."

The original plan for disposing of the public lands was submitted to the House of Representatives by Alexander Hamilton, Secretary of the Treasury, on the 20th of July, 1790. Its general features have been preserved with singular absence of radical changes. While, however, it blocked out very precisely the line of general and permanent legislation to be enacted, it expressly provided "for accommodating to circumstances which cannot beforehand be accurately appreciated and for varying the course of proceeding as experience shall suggest to be proper." In the succeeding ninety years Congress has acted upon this elastic rule by supplementing the permanent system with innumerable statutes, local in their application and temporary in their intended term. A public land system has resulted which, while resting primarily upon laws "general and permanent in their nature," is permeated with a series of laws local and temporary in their application. And while such local and temporary laws may have been limited in their past or may be restricted in their future operation, yet rights have accrued under them and extended over the entire public domain. The various grants of lands to States for purposes of education or of internal improvement are apt illustrations of this class of statutes; and it may well be questioned whether the titles of our citizens derived in late years from the United States do not rest as largely upon the local and temporary, as upon the general and permanent legislation. The jurisdiction of this commission was extended to all these laws so as to exhibit the whole system under which public lands are segregated and disposed of. In the performance of that duty the commission has found it necessary to collate all the laws enacted upon this subject by Congress (aggregating about 3,500), and by elimination of obsolete and repealed matter to reduce the same to existing legislation. It has also been necessary to digest the land decisions of all the Federal courts; of the supreme courts of the several States, and of the Interior Department. Very considerable progress has been made in both branches of this work and the results will be presented to Congress hereafter in the form of a final report. With the code will be an introduction reviewing the history of the origin, organization, and progress of the land system. In this work also considerable progress has been made.

II.—New and amendatory legislation.

In order to gain a more thorough knowledge of the subjects upon

which the commission was required to deliberate; to ascertain the practical workings of existing laws and their adaptation to the settlement of the public domain; and also to learn the views entertained relative thereto by the people of the West, the commission believed it necessary to visit that part of the country before formulating any recommendations. Accordingly, on the 18th of August, 1879, the commission met at Denver, Colo., and during the remainder of that month and until December 1st visited consecutively, either as a body or in detachments, all of the States and Territories west of Kansas and Nebraska except Washington Territory. In order to acquire a much wider range and fuller expression of opinion than would be possible by personal interviews, the commission distributed, through the kind assistance of governors, Congressional delegations, and United States land officers, a printed list of interrogatories, to which numerous answers were received. The commission has been fortunate in securing the earnest attention of the most intelligent people of the West both in official and in unofficial positions, and have succeeded in eliciting expressions of opinion from those whose long experience and thorough practical knowledge of the working of our present land system gave to their advice a special value. It is felt to be a cause of peculiar gratification that the testimony herewith laid before your honorable body contains so much that is both learned and practical. The commission is indebted to the several Congressional delegations of the Western States and Territories, containing public lands, for intelligent aid rendered by distributing the beforementioned circular letter of inquiry among representative constituents. We also deem it just and proper to add that valuable assistance was rendered us by the Hon. George L. Converse, chairman of the House Committee on Public Lands, who at his own expense accompanied the commission to the field and performed more than his share of labor in order to qualify himself to act intelligently upon any report from this commission which might be referred to his committee.

In carrying out its prescribed duties certain considerations seemed to the commission to be entitled to a controlling weight in guiding and determining its recommendations as to new legislation.

1. In the first place the existing land system has been tried for many years, and on the whole is believed by everybody to be sound in principle and based upon a wise and beneficent policy. It is believed to have accomplished, thus far, the objects for which it was devised in a manner which may not have been perfect but which has been reasonably satisfactory. Whatever faults it may now have were felt to be those arising rather from changes in the subject-matter with which the existing land laws have to deal, and not inherent defects of the land system. Created for the disposal of the lands in the original Northwest Territory it might need some readjustment of parts when extended over the widely different region of our subsequent acquisitions of territory. But whatever might be the changes rendered necessary by this shifting of their field of operation, it was felt that they could not be of such a radical character as to call for extended and sweeping changes, either in the aims and policy of those laws or in the general plan of the machinery by which they are administered. Hence, it seemed to your commissioners that their proper line of inquiry was to ascertain in what particulars the land laws required to be changed in readapting them to the arid regions of the West, while preserving as perfectly as possible the original spirit and intent

with which they were applied to the more favored regions of the Mississippi Basin.

2. Another controling consideration was that the policy of the government in respect to its public lands has been to devote them to settlement by industrious citizens. It is true that at an early period in the operation of the public-land system the sale of land had been looked upon as a source of revenue; but this policy long ago gave place to one which regarded the public lands as a field in which the great and rich harvest to be reaped consisted of thousands and perhaps millions of good citizens, instead of a few dollars arising from the net proceeds of sales at trivial prices. Hence the policy of the government has of late years been to encourage settlement by fixing a nominal price only upon its lands, but laying the greatest stress upon those conditions which are designed to secure *bona fide* occupation and utilization by actual settlers. It was a conviction of the wisdom of this policy which led Congress to enact the homestead law, and that action has been abundantly justified by experience.

3. A third material consideration is the policy limiting the amount of land which one person can acquire directly from the government. There is a deeply seated conviction in the minds of a majority of the people of this country that any system which tends towards or even permits the aggregation of very large tracts of valuable land into the ownership of a single person is not only unrepublican, but is essentially unjust. In no respect is the principle of "the greatest good to the greatest number" more dependent upon wise legislation than in its application to the distribution of land. These convictions have led to the engrafting upon the several acts for pre-emption, homestead, timber culture, and other forms by which public land is acquired, of limitations of the quantity attainable directly by one person to an unit of area, which in the theory of the law is sufficient, and no more than sufficient, to secure to the settler a reasonable and moderate support suitable to a citizen in average circumstances.

The foregoing considerations being, as it were, cardinal points of public policy towards the land system, it remained for the commission to inquire how far and how well the legislative provisions and executive machinery established for these purposes attain the objects for which they were devised. Here your commissioners are of the opinion that the laws and machinery of their execution have not been constructed in all respects so as to secure the objects which they contemplated. The main objects have indeed been generally reached, though not without occasional failures. It may remembered, however, that a portion of these laws, and especially those which were enacted for the settlement of the western part of the United States, are in a large degree recent, and are to a considerable extent experimental in their nature, and if they do not secure in the fullest measure their objects, they at least furnish suggestions as to the means by which their defects may be remedied.

Up to June 30, 1879, the quantity of public land surveyed was 734,591,936 acres, leaving yet to be surveyed, excluding Alaska, 1,080,197,686 acres. The disposition of the public domain has generally been in accorance with the fundamental principles of our land policy, and this disposition has been general satisfactory. Had it been otherwise, it would have been made known promptly to Congress through loud and general complaints of the people. Moreover, the ease and rapidity with which any qualified person can make entry of such public land as

yet remains is apparent to all. The system is a catholic one, and as free to the foreigner as to the citizen.

But, on the other hand, instances may be noted where the laws fail to attain the very results which they were ordained to accomplish. As an illustration, the theory of the settlement laws is that an unit of 160 acres of land is sufficient for a person; yet under the various settlement laws now in existence it is possible for a person to acquire 1,120 acres of the public domain. There can be no doubt that much land has passed from the government into the hands of individuals in a manner and under conditions which were not contemplated when the laws were made; that the conditions required by law have been imperfectly fulfilled by settlers and claimants; that compliance with such requirements has often been perfunctory and nominal, or even evaded altogether. It also appears that lands which should be opened to occupation and settlement are practically barred therefrom by the effect of restrictions which render their acquisition extremely burdensome and difficult, or qualify the titles by means of reservations which render them undesirable and lead the best class of settlers to avoid them. In the case of timber lands, the position of the settler with respect to the laws is practically anomalous. The laws relating to mineral lands are such as are calculated to foment litigation and contest rather than to secure just ownership and quiet title. A very great proportion of the lands of the west cannot become settled and pass into private ownership, because under the terms of existing laws it is not desirable to the settler to acquire them.

These difficulties have in the main grown out of the want of adaptation to the present public domain of the laws which were originally framed for the northwest Territory. In the latter region nearly all the land had a value fully equal to the price which the government put upon it at the time it was first wanted for settlement, and so far as natural advantages and the value arising from natural causes, as distinct from artificial, are concerned, one acre of that region was about as valuable as another. There was a kind of homogeneity in the quality and value of that region. It was all valuable for agriculture and habitation. But in the western portion of our country it is otherwise. Its most conspicuous characteristic from an economic point of view is its heterogeneity. One region is valuable exclusively for mining, another solely for timber, a third for nothing but pasturage, and a fourth serves no useful purpose whatever. The very small proportion which is capable of agriculture must, in the greater part of the West, be irrigated in order to yield a crop. Hence it has come to pass that the homestead and pre-emption laws are not suited under the old conditions attached to them for securing the settlement of more than an insignificant portion of the country. Hence, too, it has arisen that the want for lands which could not be advantageously acquired under those laws has led to practices not contemplated in the statutes for the purpose of acquiring them in quantities and at prices more acceptable to occupants, or has even led to their occupation by possessory titles or rights, which amount to practically unlimited seizure without record or notice (except to trespassers) and without tender of payment. It may be said that the people of these regions have to a certain extent framed customs which take the place of laws. In other words they are a law unto themselves.

From time to time laws have been passed which were designed to meet these difficulties; not a systematic revision of the land laws, but attacks upon evils in detail. Each law was designed to meet some special and limited class of cases. Thus the timber-culture act was in

tended to utilize lands in regions devoid of timber by offering a bonus upon its propagation. The desert-land act was intended to promote the reclamation of lands by irrigation which would otherwise be sterile. Laws were passed to prohibit and prevent depredations upon timber; others to make more stringent and exacting the forms of notice preliminary to the perfecting of titles, in order to prevent the fraudulent acquisition of lands. These various and numerous enactments were in most cases beneficial and even indispensable. They were natural efforts to meet special wants and necessities, or to counteract special abuses. But through them all there runs a common defect. They were not coordinated to the general system. They were seldom fitted and keyed into the fabric of the land-laws in such a manner as to form a perfectly harmonious and congruous part of a symmetrical whole. While curing some defects they gave rise to others. Many of them did not look beyond the attainment of a narrow and specific object to the relations which it must necessarily bear to a comprehensive and intimately related code. It is true that codes relating to important branches of administration and jurisprudence do frequently grow into stable form and definite shape by this kind of accretion, but it is usually accompanied by the protracted process of hammering and beating into shape by many blows of judicial decisions and by the addition of volumes of court-made law to fill wide gaps in the statutes. During such a process experience has shown that much hardship has been entailed, many bitter and expensive contests have been provoked and both law and individuals have been trampled upon in the conflicts. In this connection the want of adaptation of the parts to the system will be illustrated when the subject of the mining law is discussed, and also by the operation of existing laws relating to timber and to agriculture by irrigation. It may be proper to mention here the growth of one very serious evil arising from this piece-meal legislation, which is the necessity it produces of qualifying and encumbering the titles which the government issues with various forms of stipulations, reservations and provisos. Complaint has been made that in some portions of the West unusual difficulty and expense is rendered necessary in order to fulfil the requirements of two or more incongruous series of laws for procuring title, and that the title thus obtained is of uncertain value and validity.

It has been the aim of the commission, so far as practicable, to readjust these incongruities without introducing any unnecessary change in the substance or essence of any of these statutes, and to harmonize the whole in consonance with the cardinal principles of the public-land laws which have already been specified. Much difficulty, however, has been experienced because the various laws have already taken root, rights have vested under them, lines of judicial decision have taken direction, and a definite method of administration and construction has grown up. Hence the question has often presented itself whether it is wiser to acknowledge and perpetuate existing evils which are known, or to introduce fresh ones of unknown extent. In general, the commission has chosen the conservative view. Instances, however, have arisen where it seemed that the wisdom and even necessity of introducing both new legislation and important modifications in the old were unmistakable. The commission will therefore recommend some new laws which will chiefly relate to classes of land peculiar to the western region and not heretofore specially recognized by statute, and they will also offer amendments looking to the perfection of existing legislation as to the other classes. Inasmuch as this will necessarily cover the entire public-land system, and as our recommendations for both new and corrective legis

lation will, if adopted by Congress, be substituted for some chapters of title 32 of the Revised Statutes, and will permeate sections and parts of sections of other chapters of the same title, we have put our recommendations in the form of a land-bill which covers the entire public-land system in its general and permanent features. If enacted by Congress it will take the place of all of Title 32 of the Revised Statutes and of so much of Title 11 as relates to the General Land Office. We recommend the enactment of the bill herewith submitted as the basis of our report, and will now proceed to discuss briefly the subordinate features, and state the reasons which have induced their adoption by the commission.

ORGANIZATION.

The machinery of the land system lies at the threshold of the successful administration of the law. If defective and incomplete in its organization, it will not be operative from inherent weakness, and the law will, in the ratio of such weakness, remain a dead letter upon the statute book. If cumbersome and complicated it will, by cumulative delays and excessive cost, impair and retard the operation of the law it was intended to execute. The commission has sought to put the officers of the land system on such footing in point of numbers and powers as would, at a minimum expenditure, secure a maximum efficiency. The present organization was adopted many years since, and it has not been perfected to keep even step with the administrative growth of the system. In the last twenty years the surveying districts have increased from 10 to 16; the district land-offices from 53 to 94; the acres annually surveyed from four millions to more than double that quantity; and the acres annually disposed of from three millions to over nine millions. During nearly the same period the system of land grants to aid the construction of railroads and wagon roads has been matured; the swamp-land, agricultural college, and other grants to States have been made; the homestead laws and the timber-culture laws have been enacted; the practice of selling the fee to the mineral lands has been engrafted upon our legislation; and by Indian treaties and the acquisition of Mexican lands the area of our public domain has been enlarged. The adjustment of each of these involves the settlement of difficult questions of the most important character both to the settler and to the government. The business imposed upon the land organization has been thereby largely augmented, and the executive labor arising therefrom has been proportionately increased. But Congress has heretofore met their increased demands only with temporary expedients, and the permanent organization of the General Land Office is even smaller to-day, when the population of the country has swollen to 48,000,000, than it was when only 27,000,000 acknowledged one national authority. The prosperity of a nation is interwoven with the security of its land titles; and the titles to our public domain depend largely for their security upon the accuracy and promptness of the operations of the Land Bureau and its subordinate agencies. It is important that the officers of that organization should be of sufficient integrity and trained capacity to qualify them for the lawful adjustment of the intricate and delicate questions of fact and of law constantly arising in the administrative construction of the various statutes which constitute our land system. Duties of such responsibility require men of experience and ability, and for their employment and their retention an adequate compensation should be provided. The temporary expedients here-

tofore resorted to in Congressional enactments have been uniformly an increase of low-grade officers with small compensation. But brains command a market price as well as merchandise and while the increase of small salaries has augmented the hands and feet of the organization, it has not materially enlarged the volume of intellectual power to direct their movement. The organization has had an excess of physical force and a deficiency of brain force. The commission has sought to increase the latter and to diminish the former. Taking the entire land organization, the commission has increased the compensation and the number of the higher grade officers, and has thus augmented the expenses by about $50,000; but it has also abolished useless officers, and reduced the number of low-grade employés so as to diminish in that direction the expenses about $90,000. An aggregate saving of about $40,000 would result to the annual appropriations for the land service if the whole of our recommendations should be adopted, which we do earnestly recommend in the interest of a wise and sound economy.

GENERAL LAND OFFICE.

The commission respectfully ask a careful consideration by Congress of its statement regarding the officers and clerical force of the General Land Office, their salaries, and the duties they perform, and the recommendations for securing greater efficiency in that office.

The General Land Office was organized as a separate bureau in the Treasury Department by an act of Congress, approved April 25, 1812. The duties, though important, were simple and without many complications at that time. The public lands were disposed of only by sales for cash. No grant of any kind had then been made; no mining laws were in existence; the population of the country was comparatively small, and settlement upon the public lands proportionately slow. The thirteen original States were sparsely populated and immigrants and native-born citizens found homes mostly within their limits, while settlements were founded but slowly in the Northwest territory. The Commissioner of the General Land Office, for the comparatively unimportant duties then to be performed, was allowed the same salary as was allowed "the Auditor" of the Treasury; and it remained the same until the year 1836, when the office was reorganized, and the salary of the Commissioner was fixed at $3,000 per year, and has since been raised to $4,000, which amount is not adequate to the duties and responsibilities of the office. The salary should be equal to that of any other bureau officer of the government.

At the date of the reorganization in 1836, there was still comparatively little to do in the General Land Office; the method of disposal of the public lands was the same as in 1812, the amount disposed of being greater. The territory acquired by the treaty of Guadalupe Hidalgo and by the Gadsden purchases was very great in extent, and consisted largely of grants and private holdings which were not segregated from the mass of public domain acquired by said treaties. The work of ascertaining the nature, extent, and boundaries of the grants and private holdings, and segregating and patenting the same which was devolved upon the General Land Office by laws made in pursuance of those treaties has been for many years more difficult, requiring a higher order of ability than all the work of the office prior to the date of the treaties named. In addition to the private land claims, and since the date at which their settlement became a duty of the office, all, or nearly all, land grants

by the government, such as grants to aid in the construction of railroads and telegraph lines, the grants of swamp and overflowed lands to the States, the grants for wagon roads, agricultural colleges, internal improvements, university grants, common-school grants, and grants for slack water navigation have been made, and the ir adjustment added to the other duties of the land office. The homestead, timber-culture, mineral, and bounty land acts have also to be added to the great volume of work that has in the last quarter of a century been laid upon the General Land Office under the various acts of Congress. The work of selling lands for cash and the adjustment of Virginia military scrip, which comprised nearly the whole duty of the office until about the year 1850, would not make any perceptible difference in the work of the office to-day if it were entirely withdrawn or added to it; and yet, strange to say, the clerical force of the office was greater during some part of that time than it was in the years 1877 and 1878, and nearly equal to what it is in the year 1880.

The conflicts arising between the government and grantees and between settlers and grantees require the best ability for their adjustments. Questions which thus arise are at all times pending before the office. Cases involving greater amounts come before the General Land Office than before any other branch of the executive department of the government. The difference between what the beneficiaries of a land grant may claim and what may be awarded often amounts to millions of dollars in value. The adjudication of many cases involving millions of dollars worth of property is not infrequent. Prior to the acquisition of the territory in which private land claims are situated, and the enactment of laws granting lands equal to the area of one and a half States the size of Pennsylvania, to a single corporation, and the enactment of laws for the sale of mineral lands, cases involving more than a few hundred dollars could not often arise.

Notwithstanding the great increase of labor in this office, and the change in the character of the work, requiring higher and better qualifications, the law officer of the bureau and its principal clerks are paid only the salaries fixed by law forty-four years ago, when the salaries of members of Congress were fixed at eight dollars per day for the time employed. Since then all grades of salaries, save those of low-grade officers who toil throughout the year without vacation, have been greatly increased. Increase of numbers of clerks at low salaries has from most urgent necessity been allowed by law.

The commission, with a view to bettering the service, would respectfully recommend the reorganization of the General Land Office shown in the following tables, which show the difference between the present and the proposed organization:

PRESENT ORGANIZATION.

1 Commissioner, at $4,000	$4,000 00
1 chief clerk, at $2,000	2,000 00
1 recorder, at $2,000	2,000 00
1 law clerk, at $2,000	2,000 00
1 principal clerk public lands, at $1,800	1,800 00
1 principal clerk private land claims, at $1,800	1,800 00
1 principal clerk surveys, at $1,800	1,800 00
6 clerks class four, at $1,800 each	10,800 00
1 draughtsman, at $1,600	1,600 00
22 clerks class three, at $1,600 each	35,200 00
1 assistant draughtsman, at $1,400	1,400 00
40 clerks class two, $1,400 each	56,000 00
80 clerks class one, at $1,200 each	96,000 00

30	clerks class one, $1,000 each	$30,000 00
9	copyists, at $900 each	8,100 00
9	assistant messengers, at $720 each	6,480 00
6	packers, at $720 each	4,320 00
12	laborers, at $660 each	7,920 00
223		273,220 00

PROPOSED ORGANIZATION.

1	Commissioner, at $6,000	$6,000 00
1	Assistant Commissioner, at $3,000	3,000 00
1	chief clerk, at $2,500	2,500 00
1	solicitor, at $2,700	2,700 00
1	recorder, at $2,400	2,400 00
1	clerk in charge of surveys	3,000 00
9	chiefs of divisions, at $2,400 each	21,600 00
1	chief draughtsman, at $2,200	2,200 00
10	assistant chiefs of divison, $2,000 each	20,000 00
15	clerks class four, at $1,800 each	27,000 00
35	clerks class three, at $1,600 each	56,000 00
40	clerks class two, at $1,400 each	56,000 00
50	clerks class one, at $1,200 each	60,000 00
10	draughtsmen, $1,200 each	12,000 00
20	clerks, at $1,000 each	20,000 00
10	copyists, at $900 each	9,000 00
2	packers, at $840 each	1,680 00
1	chief messenger, at $840	840 00
9	assistant messengers, at $720 each	6,480 00
12	laborers, at $720 each	8,640 00
229		321,040 00

The commission would recommend a much larger force for one or two years, if there were room in which to advantageously place it. The room allotted to the Generel Land Office is not quite the worst that it could be, nor is it wholly inadequate, but it approximates both. The immense bulk of valuable records of the office is stored in cheap wooden cases in dark rooms and darker halls, to which clerks must constantly go for examination of files of papers and volumes of records, which, when found, cannot in dark or cloudy weather, be read without carrying them to a window, which may be a hundred feet away.

It may be safely estimated that the want of more convenient and suitable room costs the government the one-fourth part annually of all money appropriated for clerica force in the General Land Office.

If there were sufficient and suitable room for the purpose, it would be both wisdom and economy to add as largely to the clerical force as might be necessary to enable the Commissioner to thoroughly inspect the records of the office, and ascertain errors, reproduce all mutilated and worn-out records while it may be done, but the room is not sufficient; and the best thing that can be done, until room is provided, is to give the maximum force that can be employed and pay salaries high enough to get good, if not the best, talent.

APPEALS.

Public-land controversies involve large values. Their solution depends upon an adjustment of conflicting averments of fact and the application thereto of a proper construction of legal principles. In practice the original jurisdiction in the administration of the public land laws is lodged with nearly one hundred district land officers, and with sixteen surveyors-general. Their action is reviewable by the Commissioner of the General Land Office, and his in turn by the Secretary of the Interior. The rule is settled that, within the scope of their author-

ity, the findings of fact by these executive officers are final; but that the correctness of their application of the law is reviewable by the judiciary. It would seem to follow that the conduct of this extensive litigation before the executive should be governed by settled rules, which should define with sufficient precision the rights of litigants and the methods by which their claims of right should be ascertained and adjusted. Hitherto such control has mainly rested upon the loose and changing practices of executive regulations. So far as the commission has been advised, the pre-emption law is the only statute which in general terms enacts a right of appeal, and that nakedly affirms the *right*, but is silent upon the methods of its prosecution. Under all other statutes a review of the action of subordinate officers in the public-land service has depended upon the supervisory authority of their superiors, and it is invoked by claimants, subject to the arbitrary regulations or caprice of executive discretion. The privilege of review allowed to one claimant may be denied to another. If allowed, it may be under different conditions of time and mode of presentation. The present Secretary of the Interior has sought to regulate these and kindred defects by adoption of sundry rules of practice; but the authority for such rules is not clear, and should be supported by express statute. We have therefore sought to leave in the Commissioner or Secretary unlimited discretion to supervise the operations of the Land Department, when in their opinion the public interests require their intervention; but we have fixed the time and conditions within which claimants could by appeal compel such intervention. We have made such appeal a matter of right, and not of privilege; we have fixed a period to its operation, and have prescribed the conditions of its prosecution. If adopted by Congress, these provisions will not only extend the security of statute over the appellate prosecution of public-land controversies in the executive departments; but will assure a seasonable prosecution, and cut off stale claims. The occasion for much of executive delay in the settlement of contests will thereby be avoided.

SURVEYS AND SURVEYORS.

The rectangular system of land-parceling surveys and the division of public lands into townships, sections, quarter-sections, and quarter quarter-sections was devised by a committee of the Continenal Congress, consisting of Messrs. Jefferson, Williamson, Howell, Gerry, and Reas, who, on the 7th of May, 1784, reported "An ordinance for ascertaining the mode of locating and disposing of land in the Western Territory, and for other purposes therein mentioned." The chairman of the committee was Thomas Jefferson, of Virginia, then a Delegate to Congress.

The ordinance was considered, debated, and amended; and on the 3d of May, 1785, on motion of Mr. Grayson, of Virginia, seconded by Mr. Monroe, the size of the townships was reduced to six miles square. It was further discussed until the 20th of May, 1785, when it was finally passed. (*Vide* Public Land Laws, Instructions, and Opinions, part 1, page 11.)

The system thus initiated has gradually been amended by subsequent acts of Congress, approved as follows:

May 18, 1796. (U. S. Laws, vol. 1, page 464.)
May 10, 1800. (U. S. Laws, vol. 2, page 73.)
February 11, 1805. (U. S. Laws, vol. 2, page 313.)
April 24, 1820. (U. S. Laws, vol. 3, page 566.)

April 5, 1832. (U. S. Laws, vol. 4, page 503.)
May 30, 1862. (U. S. Laws, vol. 12, page 409.)

The second section of the last-cited act legalizes the Manual of Instructions to the Surveyors-General, prescribed according to law by the principal clerk of surveys, pursuant to order of the Commissioner of the General Land Office in 1855.

All land-parceling surveys have been made under this system since its adoption. Changes or a departure from it under certain circumstances have been authorized by law, but have never been adopted in practice.

Nearly a century of experience under this law has proved the wisdom of it. Unlike many other methods or systems in business or science which owe their excellence to growth and experience, this system came from the hands of its founders so perfect and well adapted to the purpose for which it was intended that no organic change has been found necessary in practice, though authorized by law. But the means or methods of giving effect to the system have been the subject of frequent legislative enactments.

It was perhaps never intended or expected that land-parceling surveys should be made with the same accuracy as surveys made by the Superintendent of the Coast and Geodetic Surveys. Such accuracy would be impracticable and unnecessary in land-parceling surveys which have for their objects accuracy of description and location on the earth's surface with reference to meridian and base lines established for the purpose of description of lands after survey.

The present system cannot fail to commend itself to all when it is remembered that under it the survey and numbering of principal meridians, townships, ranges, and sections, each smallest subdivision or forty-acre tract, may be instantly pointed out on any part of the map of the United States where the surveys have been extended.

A whole continent may be divided into tracts of forty acres or less, and the description of no two tracts be the same or so nearly the same as to create confusion.

Objections have seldom if ever been urged against the plan of surveying provided by existing laws, but objections have been urged against the manner of performing the work on the ground. The task of removing these objections is the one to which the committee addresses itself.

In consequence of the rapid settlement of the Western States and Territories, large areas of country had to be surveyed on short notice. These surveys were made under contract not above the maximum price fixed by law. Much of the country surveyed was situated at long distances from the offices of the surveyors-general.

No adequate system of inspection was provided for by appropriation to defray the expense of such inspection, and consequently all has had to be left to the honesty of the deputy having the contract. In addition to the surveys rendered necessary by the rapid progress of settlement, other large areas have been surveyed into tracts of one hundred and sixty acres, which should not have been surveyed until such time as actual or prospective settlement in the near future required them to be made.

In cases where surveys have been made long prior to settlement, and marked only by the imperfect and cheap methods of monumentation allowed by law, some difficulty has been found in tracing the lines and finding corners, which facts have to some extent caused accusations of fraud, in the surveys, to be made when perhaps, in fact, no real grounds for such accusations existed.

The provisions of law relative to monumentation seem to have been made in contemplation of being able, in all places, to find "witness trees" for or to each corner, and wood or stone in abundance and near at hand, for monuments; consequently no provision of law has ever been made for procuring monuments which would cost anything more than monuments of wood or stone found near at hand, or by marking the corners by a mound of earth.

It does not appear to have been considered when the law was enacted that surveys would necessarily have to be extended over great areas like the plains of Kansas, Nebraska, and Dakota, where neither stone nor timber could be procured without considerable cost, and where mounds could be easily destroyed by the wind or by stock, owing to the light character of much of the soil.

The evils complained of in surveys heretofore made appear to be three: first, a waste of money by surveying into small subdivisions swamp and arid lands, which may not soon if ever be used or occupied in tracts less than a township; second, difficulties arising in retracing lines and finding corners, owing to imperfect monumentation; third, inaccuracies in surveying and measuring the lines, alleged to be in consequence of letting contracts for the surveys, instead of having the work performed by deputies receiving a fixed monthly or annual salary.

To prevent the recurrence of the alleged evils, the commission deems it best to recommend that hereafter lands which are notoriously swamp, which have been granted to the States, and pasturage lands, may be surveyed and patented by townships; that a proper system of monumentation may be prescribed by the Commissioner of the General Land Office, and that the cost of monuments shall be paid from appropriations for the survey of public lands; that all surveys of public lands shall hereafter be made by deputies, who shall be paid a salary by the day, month, or year, except in such cases as may arise where it would be manifestly for the interest of the government to have the work performed under contract.

It is also thought best to recommend that hereafter all boundary lines of States and Territories which remain to be surveyed, and corrections of those already surveyed, shall be surveyed under the direction of the Superintendent of the Coast and Geodetic Surveys; for the reason that the survey of said boundaries requires instruments and qualifications which do not necessarily appertain to land-parceling surveys and surveyors. It is also proposed that the Superintendent of the Coast and Geodetic Surveys shall connect with his surveys such monuments of the land-parceling surveys as he may find in extending his surveys.

The foregoing comprise all the radical changes which the commission deem it proper to recommend. Some immaterial changes are recommended which will appear by a comparison of the existing with the proposed law.

The commission is of the opinion that the salaries of surveyors-general should be uniform and three thousand dollars per year. The proposed legislation requires that all surveyors-general hereafter appointed shall have scientific and practical knowledge of surveying, and it is submitted that men possessing such qualifications and others fitting them for the responsibilities of such an office should be entitled to the salary named. The salaries of the deputy surveyors are also fixed at a rate not exceeding three thousand dollars per year for the time employed in the field, the actual amount to be fixed by the Commissioner of the General Land Office, with the approval of the Secretary of the Interior.

REGISTERS AND RECEIVERS.

Section sixty-three of the act proposed by the commission reads as follows: "There shall be appointed by the President, by and with the advice and consent of the Senate, one officer for each land district established by law, who shall be styled register of the land office." By section sixty-five it is provided that such registers shall be allowed an annual salary of three thousand dollars. The office of receiver of public moneys is not provided for or continued by the proposed legislation, as, in the opinion of the commission, no necessity for such an office exists. There were no such officers in the beginning of the public land system. They seem to have been appointed for the purpose of attending land sales in the northwest territory to receive and convey the money to the Treasury of the United States. If facilities had existed equal to those of the present day for transmitting and depositing money, it is not probable that any receivers would ever have been appointed. If a necessity for receivers of public moneys arising from sales of land ever did exist it no longer exists. The sales of land for cash is no longer the policy of the government. The amount of money received in any one year is not large. Safe and reliable express companies have officers in nearly every town where a land-office is located, and these facts at least lessen the necessity for such an officer. By executive regulation some other slight duties have been required of receivers, such as hearing contested cases, and joining with the register in giving opinions in cases heard. It is thought that the receiver concurs in the opinion of the register more frequently than he hears testimony or assists in formulating the judgment. For the reasons given and others which might be, if necessary, the commission is of the opinion that two heads to a local land office are not more necessary than a duplication would be in any other office, There were in the fiscal year 1879 ninety-four local land offices, each having a register and receiver at a salary of $500 a year, and each was entitled to $2,500 more, provided the business of the respective offices entitled them to that amount. The gross amount actually paid to the one hundred and eighty-eight registers and receivers for the year, was $373,554.99 or an average of $1,986.99. If there had been but ninety-four registers, at $3,000 each, a saving of $91,554.99 would have been effected, and the work performed in a more satisfactory manner by reason of having a good and well paid officer in each office wholly responsible for the work. At many of the local land offices, where the business is so small that the salary and emoluments amount to less than $1,000; good men cannot be induced to accept appointments as registers and receivers and the result is that the work is badly done, which causes much labor and expense on the part of the General Land Office, making it eventually cost the government more than it would have done had a competent man been employed in the first instance, at a salary of $3,000 a year. In many of the local land offices there has hitherto been neither order nor system. The business has been neglected, the books not having been posted, and neither the papers properly filed nor letters answered. This condition more frequently occurs in the offices doing but a small amount of business than in offices doing more. It is often the case in offices where but little work is to be done, and consequently but little pay to be received by the officers, that they entirely neglect the business. The little they do consists of sending up a monthly statement of the few entries made or declaratory statements filed. The data upon which the returns are based being loose papers and memorandums, which are left carelessly lying about the offices and finally lost before the tract and

plat books are written up. The manner of doing business in such offices as those described results in duplicate entries and filings, causing much confusion, expense, injustice, and greater cost to the government than would accrue under a better system and with better paid officers.

CLASSIFICATION.

The administration of land affairs in the United States, with its system of parceling, methods of survey, and modes of disposal, was inaugurated at a time when all the lands were considered as available for agricultural purposes. It is true that differences were found in quality of soil, in topographic features, and in the character and value of the growing timber, but the general physical conditions were such that on all of these lands agriculture could be prosecuted with a certainty of reward by relying on climatic conditions relating to rainfall and temperature. That is, all of these lands were supposed to be ARABLE LANDS.

Later it was discovered that great values existed in lands bearing certain minerals, as coal, iron, lead, and copper, of much importance to the industries of the country. By various methods an attempt was made to dispose of these mineral lands—all local or temporary—until gold and silver were discovered in California and the adjacent country. The rapid development in mining industries in this region of mineral wealth led to the practical establishment of a second class designated as *mineral* lands. The establishment by statute of this new class merely confirmed the local customs where the mining operations were in progress, and thus supplied a want demonstrated by wide experience.

The method of disposing of the public land by homestead settlement was in vogue in the western portion of the United States during the very time of the chief development of mining industry, and this method was justly popular among the settlers themselves and with a large majority of the people of the United States. But homestead settlement was applicable only to agricultural land, and the mines were usually found in lands having little or no agricultural value. Great numbers of people went to the mountains in quest of speedy wealth, and not for the purpose of making homes by settling on the mountain sides as agriculturists. The army of prospectors which roamed from mountain range to mountain range, burrowing into the earth everywhere on the slightest indication of gold or silver, was composed of persons who desired to obtain titles to mines. As the region was a wilderness, and the authority of the general government was but imperfectly extended over the country, the miners framed for themselves regulations for their own government—crude, it is true, but in a general way securing justice. Under these local regulations or laws, possessory rights to mineral lands were acquired which were afterwards confirmed by statutory law, and thus this second class of lands was practically recognized in the administration of land affairs. Had the mining region of the West been occupied in such a manner as to have placed all the mineral lands in private ownership, it is not probable that the first discovery would have led to any great system of prospecting, as the adventurer would have been barred from private lands, and the mining industry which has so rapidly grown up in that country would have been delayed for years, perhaps for centuries. A wilderness of unoccupied land was a primary condition of rapid discovery, as on public land every man might search for precious metals where he pleased, and on public lands every man might acquire property rights in discovered values. Under these con-

ditions thousands of poor men, lured by the hope of discovering gold and silver, traversed the mountain ranges of the far West with pick, shovel, and pan, scrutinizing every indication of the presence of ores, and thus an army of men was engaged in discovery. Free exploration and the right to acquire property in mines by discovery led to the establishment of the great mining industries of the West.

While the establishment of mining industries depends upon the conditions above enumerated, its permanent prosperity depends chiefly upon deep mining. Deep mining is secured by aggregating the small holdings acquired by discovery into holdings sufficiently large to warrant expensive "plants" in works and machinery. Thus a wise system of administering affairs relating to mining lands must recognize the importance of discovery in which poor men can engage, and the importance of deep mining, which requires aggregated capital. Summarily stated, it is essential to recognize the following facts relating to mineral lands:

1. The values of mineral lands are chiefly subterranean.
2. The mineral lands bearing gold and silver are chiefly in mountainous regions.
3. It is frequently the case that large values are found in very small areas.
4. Values are not immediately apparent, but must be discovered.
5. The development of mining industry in precious minerals depends primarily and chiefly upon the progress of discovery.
6. The permanence and continued prosperity of the industry depends upon deep mining, which requires aggregated capital.

It is apparent from these considerations that a system of administration relating to the survey and disposal of lands chiefly valuable for their ores must differ widely from that relating to arable lands, and hence it is necessary to recognize a class of MINERAL LANDS.

Under the general head of mineral lands a sub-class of coal and iron lands is practically recognized by providing for their disposal in a manner differing from other mineral lands.

Coal is not found to occur in the same geological manner as gold, silver, and other minerals of like geological distribution. A coal bed is a stratum interbedded among other strata. Workable gold ores are found in fissures or otherwise irregularly aggregated in rocks stratified or unstratified, but, perhaps, never found in a regularly deposited stratum interbedded among other strata. A single continuous stratum of coal may extend over a very large area; a single deposit of gold or silver ore has an exceedingly restricted area. In many other ways the two classes of deposits differ widely.

Iron sometimes has the same method of occurrence as coal and sometimes as gold, and thus in geological distribution is allied to both classes, but it is thought best to include iron with coal, and to provide for the sale of coal and iron lands in larger tracts than gold and silver lands, and without the conditions and restrictions imposed on the latter.

Westward in the United States the continuity of arable land is broken, so that in the Pacific half there is a vast area where agriculture is dependent upon artificial irrigation. These lands are not immediately available to the settler for agricultural homesteads; they must first be redeemed by conducting the waters from the rivers and creeks over them by canals ramified through the tracts to be cultivated.

In the proper administration of affairs relating to these lands, it is necessary to consider the following facts:

1. These lands, in their natural condition, cannot be used for agriculture.

2. These lands, to be of any value, must be irrigated by conducting the running waters of the region upon them.

3. In general it is not practicable to redeem them in small quantities. Economy demands that all of a stream should be utilized in irrigation when it has once been taken from its natural channel. Hence their redemption requires the investment of aggregated capital.

It thus appears that special laws must be enacted for the disposal of these arid lands, and hence the necessity of recognizing a class of IRRIGABLE LANDS.

In all of that region where agriculture is impossible without irrigation the streams are comparatively small and infrequent, and the water which they will afford for irrigation is limited to such an extent that only a small part of the land can be irrigated thereby. But these arid lands have a value, as experience has abundantly shown. They bear scant but nutritious grasses, and flocks of sheep, herds of cattle, and bands of horses are pastured thereon. A great pasturage industry has thus grown up on lands belonging to the general government, for which at present there is no adequate protection, as the people engaged in these pursuits have no proper titles to the lands which they occupy.

In the administration of affairs relating to these lands it is necessary to observe the following facts:

1. These lands are so arid that in their natural condition they cannot be used for agriculture.

2. These lands cannot be redeemed by irrigation, as the waters of the living streams are not sufficient for that purpose.

3. These lands bear no timber of commercial value.

4. These lands are valuable in large quantities for pasturage purposes.

5. To a very large extent these lands are already occupied by people engaged in pasturage industries.

From these considerations it appears that a land system adapted to arable lands, mineral lands, or irrigable lands will not meet the wants of people who are to occupy the pasturage lands. Hence it is necessary to recognize a class of PASTURAGE LANDS.

Throughout this same general region, where the irrigable and pasturage lands are situate, the high plateaus and mountains are, to a greater or less extent, covered with forests valuable for timber for commercial purposes. But these lands are not arable by reason of inexorable climatic and topographic conditions. In this region all forests grow at altitudes where summer frosts and snows forbid successful culture. For these reasons they are not available for agricultural purposes, either with or without irrigation. The precipitous mountain slopes and cañon walls that dissect the plateaus make access to the forest land exceedingly difficult, and these forest lands are distant from the irrigable lands that lie along the rivers and creeks. Thus, in general, the forest lands are not accessible to the agriculturists who settle upon the irrigable lands, but railroads, flumes, or other means of transporting the timber from the mountains to the valleys must be constructed for the proper utilization of the timber.

During the short summer these lands are valuable for pasturage purposes, but such value is inconsiderable in comparison with the value of their forests for timber purposes. All of these forest lands, with certain exceptions in favor of mining industries, should be treated as timber lands, principally valuable for no other purpose, but of enor-

mous value for their forests, if properly protected from destruction, as these are the only timber lands of all the region where irrigable lands and pasturage lands are found, and of the greater part of the region where the mines of gold and silver occur.

Hitherto, in the settlement of the arable lands of the United States, all forests growing thereon have been considered quite as much an injury to them as a benefit, for while on the one hand the timber was valuable to the settler for building and fencing purposes, on the other hand it was an obstruction to the progress of cultivation, and the cost of clearing fields was scarcely counterbalanced by the benefit derived from the supply of timber and fuel. But the primeval forests of the arable lands have been everywhere invaded, and to such an extent have they been destroyed by the ax and by fire, that the remaining forest lands of the arable region are obtaining a greater relative value as forest than as agricultural lands.

Under these circumstances it seems wise to preserve such of the forests of the country as are of prime value for the timber which they will produce rather than to permit them to be used for agricultural purposes, and the forests destroyed.

In dealing with the forest-lands the following facts must be considered:

1. In that vast area in the West where agriculture depends upon irrigation the forests are on the mountains and plateaus.
2. These lands are of value chiefly for the forests which they bear.
3. These forest-lands are not immediately accessible to the agriculturists on the irrigable lands.
4. To utilize the timber in the industries of the country it is necessary to invest capital, not only for the purpose of manufacturing lumber, but also to provide means of transportation for the lumber to the districts where it is to be used.
5. These timber-lands are, to a greater or less extent, mineral lands, and bear great subterranean as well as surface values.
6. The most valuable lands of the arable region should be reserved as forest-lands.

All of these considerations necessitate the establishment of a class of TIMBER-LANDS.

The commission has endeavored to carefully define the five classes of land above enumerated so that each definition should be properly inclusive and exclusive. The practical application of this system of classification of the lands themselves is to be executed by the surveyors in the field, and the evidence upon which the classification is based is to be set forth in the plats and field-notes of the surveyors. But this official classification may be modified or changed upon proof of error satisfactory to the Commissioner of the General Land Office, in accordance with regulations to be prescribed by him. And it is further provided "that the issue of the patent by the United States shall, in the absence of fraud, be conclusive as to the character of the land covered thereby."

HOMESTEAD ENTRIES.

The great body of public lands are situated in the western portion of the United States. In that region the method of disposing of these lands by homestead settlement is in great favor, and the homestead system is widely popular throughout the United States. The maxim that "He who tills the soil should own the soil" is accepted as a fundamental principle of political economy. The condition of agricultural industry

involved in large holdings with tenant farmers is obnoxious alike to the traditions of the people and the principles enunciated by statesmen and publicists. Small holdings distributed severally among the tillers of the soil is believed to be a fundamental condition for the prosperity and happiness of an agricultural population. In so far as this condition is affected by the administration of land affairs under the general government, disposal of the public lands to homestead settlers is the most efficient method of securing the desired end. If provisions should be made to sell the lands in limited quantities, the plan would be made inoperative to secure small holdings, unless such purchased lands were made inalienable for a term of years, and purchase at anything more than a nominal price would operate against the very men who seek to establish homes in the uninhabited districts and operate in favor of those desiring to purchase lands solely as a speculative investment for capital. The essential principle of the homestead law is the maxim above quoted, and it operates to secure that end by primarily giving title to the land to the persons who themselves till the land, as residence and cultivation are the chief conditions on which the property is secured. The simple statement of this principle is a complete vindication of its wisdom and beneficence.

Since the passage of the homestead act entries of public land have been made under its provisions as follows:

Statement of number of acres entered under the homestead laws from the date of the original act, May 20, 1862, up to and including June 30, 1879.

Fiscal year ending June 30—

	Acres.		Acres.
1863	1,040,988.51	1873	3,793,612.52
1864	1,261,592.61	1874	3,519,861.63
1865	1,160,532.92	1875	2,356,057.68
1866	1,892,516.86	1876	2,875,974.67
1867	1,788,043.49	1877	2,178,098.17
1868	2,328,923.25	1878	4,418,344.92
1869	2,737,365.05	1879	5,260,111.29
1870	3,698,910.05		
1871	4,600,006.23	Total	49,582,591.99
1872	4,670,002.14		

Statement of number of homestead entries from the date of the original act, May 20, 1862, up to and including September 30, 1879.

Calender year—

	No. of entries.		No. of entries.
1863	13,356	1873	34,670
1864	7,921	1874	25,179
1865	12,968	1875	22,230
1866	15,973	1876	21,886
1867	19,369	1877	23,036
1868	23,542	1878	37,823
1869	30,054	1879, up to September 30	34,344
1870	34,443		
1871	42,694	Total	435,002
1872	33,514		

The table only runs to September 30, 1879. Completed to the present time the number would exceed half a million.

During the time in which this law has been in operation half a million of homes have been established on land previously unoccupied except as the hunting-ground of savages and the feeding-ground of wild beasts. It is reasonable to suppose that the greater part of the people

who have been thus benefited could not have obtained title to lands under a purchase system. Perhaps, under the benefits of this act, 4,000,000 of people are now living in their own homes, cultivating their own soil, with that feeling of responsibility to society and sense of dignity in citizenship which comes with proprietory rights in land. But for this wise provision the majority of those people would be homeless. Impelled by such considerations, the commission is constrained to recommend that all the arable lands of the western portion of the United States be held for the benefit of actual settlers under the homestead act.

It will be noticed that the system of acquiring titles to homesteads of 160 acres each applies alike to arable, irrigable, and pasturage lands, but not to mineral and timber lands.

In the history of land affairs a great step was taken in passing from the method of disposal by unconditioned sale to the pre-emption methods. By "pre-emption," lands were sold to actual settlers on deferred payment. This privilege has served a valuable purpose, but it is now less frequently used, as those who wish to obtain homes prefer to avail themselves of the homestead privilege. Poor men who cannot purchase at once have their wants supplied by gift, and if lands are to be sold at all there is no substantial reason why payment should be deferred. Its only use now is to increase the size of holdings—a result of doubtful value. It appears from evidence before the commission that a very large number of the people residing in the region where land yet remains in the public ownership desire its repeal. For all these reasons the commission has recommended that it be stricken from the statutes.

Under the terms of the act authorizing the organization of this commission, recommendations for the sale and disposal of lands are limited to the western portion of the United States. For this reason exception has been made in the bill drawn by the commission to the operation of the clause reserving all the arable lands to homestead settlers in the States of Arkansas, Louisiana, Mississippi, Alabama, and Florida. In these States the public lands are now open to entry by homestead methods and by purchase.

TIMBER-CULTURE ENTRIES.

In the central portion of the United States there is a vast area of arable land, of the highest value for agricultural purposes, destitute of timber, generally known as the prairie region and the western portion of the great plains. On these lands it is greatly desirable that trees should be cultivated, and for this purpose laws have been enacted, known as timber-culture laws. Under the various statutes enacted for this purpose, inchoate titles to land have been secured, as set forth in the following schedule:

Number of acres of land disposed of under the timber-culture act.

States and Territories.	1877.	1878.	1879.	Total.
Arizona	2,440	1,600	3,280	7,320
California	10,906	8,189	15,618	34,713
Colorado	3,023	15,474	15,962	34,459
Dakota	68,188	579,804	731,687	1,379,679
Idaho	7,035	22,169	22,634	51,808
Iowa	4,791	7,537	6,577	18,905
Kansas	238,020	592,654	1,115,659	1,946,333
Louisiana			80	80
Minnesota	76,020	348,508	257,552	682,080
Montana	398	960	3,134	4,492
Nebraska	86,933	195,652	465,968	748,553
Nevada	240	600	160	1,000
New Mexico		320	1,891	2,211
Oregon	2,509	18,446	17,046	38,001
Utah	418	1,200	2,328	4,026
Washington	19,746	77,237	66,990	163,973
Total	520,667	1,870,430	2,726,566	5,117,663

It will appear from an inspection of the above schedule that the operations of the timber-culture law are chiefly confined to the prairie lands and the eastern portion of the great plains. Wherever land is covered with native forest, it is not applicable, and wherever land is so arid that timber cannot be cultivated without irrigation it is practically inoperative, (1) because of the excessive cost of irrigation; and, (2) because the lands that are redeemed by irrigation are more valuable for other purposes. Nor is there any pressing necessity for timber-culture laws applicable to irrigable land, for wherever irrigating canals are constructed their banks are planted with trees as a protection to the canals as well as to secure a growth of timber, and even where this precaution is neglected native trees spring up from seeds deposited by natural methods, so that in any case the irrigating canals are soon bordered with a vigorous and valuable growth of trees.

But within that region where trees will grow without irrigation, and which is naturally devoid thereof, it is a desideratum of the highest importance that trees should be cultivated to afford a convenient and economic supply of fuel and timber for the inhabitants of the country, to protect the fields and flocks from the fierce storms of an unwooded region, and to check the great floods of the rainy season by which the land adjacent to rivers and creeks is so frequently injured.

Objection has been urged against timber-culture laws by those most familiar with their workings that advantage has been taken of them to secure for a term of years the withdrawal of lands from actual settlement, and the utilization of the same under inchoate titles without sincere purpose on the part of persons assuming to obtain titles thereto to actually cultivate timber trees.

In the timber culture chapter prepared by the commission an attempt has been made to secure the substantial benefits of such a law, and to avoid its abuse by restricting its benefits to those persons who are making, or have actually made, homesteads upon the public land, and debarring those who would make entries of land for speculative purposes from the benefits of its operation.

Those who are actually making homesteads on the public lands are the persons most deeply interested in executing provisions for securing the growth of timber, and it is believed that they would, under ordinary circumstances, faithfully comply with the requirements of the law; while those persons not actually making homesteads on the public land, but

simply desiring to acquire title to land for speculative purposes, would be persons who would comply with the provisions of the act in the most perfunctory manner.

TOWN-SITES.

The commission report the existing law in relation to town-sites, with the inoperative sections eliminated. Two different systems have heretofore applied to this same subject-matter—one has been the entry by the county judge, or municipal authorities in trust for the inhabitants, and the other has been a direct sale by the United States to the individual occupants. Only two cities, Petaluma in California, and Virginia City in Nevada, have sought to avail themselves of the latter law. After expensive effort to utilize its cumbrous machinery, those towns abandoned the effort. All other towns upon the public lands have been entered under the first law; and as its value is settled by experience, the commission recommend its continuance and the repeal of the alternative system.

The opening of a mining camp is necessarily attended with the settlement of a village or town. These usually spring up with great rapidity, their growth being in the ratio of the public attention attracted to the mines. Streets and alleys are opened and blocks of buildings erected in the supposed vicinity of the mines, but without intent to trespass upon the surface ground overlying such mines. On the other hand, the underground workings of the mines are pushed without reflecting that they are piercing the earth beneath such towns. An apparent conflict of right between the surface occupants and the underground mines is thus created, for the adjustment of which existing legislation is defective. These rights are capable of segregation without mutual inconvenience or disturbance; and we have recommended to that end the insertion in the respective patents of certain special clauses of exception and reservation. They are *in haec verba* the language inserted by the Executive Department since the Secretary's decision in 1875 in the case of the town-site of Central City, Colo.; and the phraseology has been universally acceptable. But as the right to insert such special exception rests purely upon Executive decision, the commission has deemed it wise to recommend its being engrafted in the statute.

IRRIGATION ENTRIES.

Agriculture is dependent upon irrigation in the southern portion of California, in Nevada, Utah, Arizona, Colorado, Wyoming, and the greater part of Idaho. Irrigation is also necessary in a portion of Dakota, a portion of Montana, and a portion of Eastern Oregon and Eastern Washington Territory. In the four last-mentioned political divisions experience has not fully demonstrated the extent of the land on which irrigation is necessary. The area where agriculture is thus conditioned is very large. The region thus imperfectly defined is being rapidly settled by reason of the discovery of gold, silver, iron, coal, and other minerals, and is rapidly becoming a region where gigantic mining industries are prosecuted. It is mainly a region without navigable waters, so that the importation of food from other regions more favored with rainfall is expensive. The home market, necessary to supply the wants of the mining population, has, therefore, led to the growth of extensive agricultural industries, based upon irrigation; and experience has abundantly demonstrated that such agriculture is remunerative; and still further, that it is greatly attractive to a large number of persons

desiring to follow agricultural pursuits, for when the land is once brought under cultivation by the use of running water, the waters themselves are a perennial source of enrichment, superior to any and all other artificial fertilizers. The soil of lands cultivated by irrigation can never be exhausted. This industry has already obtained a fair start throughout the entire region where it is properly applicable, and is, in no remote future, to be multiplied many times. Millions of people are to be thus employed; millions of homes are to be based upon this industry, and no impediment should be placed upon it, but it should be fostered by a wise system of disposal of the irrigable lands. The conditions for the successful reclamation of these lands, otherwise so arid as to be properly designated as "deserts," are as follows:

The waters of the living streams must be turned upon them. For this purpose, in every case the course of some stream must be checked and the waters diverted into a canal and carried to the tract, to be irrigated, and there distributed by a ramification of minor canals and ditches, and other subsidiary devices, so as to be made to flow completely over the entire surface of the land to be redeemed. But the construction of the hydraulic works, such as dams and canals, necessary for this purpose, demands an outlay of considerable sums of money. In the caseof small brooks and creeks, individual farmers may, with their own labor or by the investment of a little capital, compass the reclamation of a single farm. In such cases the general homestead law, applicable to arable lands, is also applicable here, but the amount of land that can thus be redeemed is small in comparison with the whole amount that can be redeemed by the use of all the running waters. To exhibit the verity of this statement, two great facts must be fully set forth.

I. To a great extent only the large streams are available for irrigation, though every large stream is in fact made up of a multitude of smaller ones, yet there are certain hydrographic conditions that render it almost impossible to use the smaller streams severally but make it necessary to conduct their waters upon the land after they have been combined into larger streams. The general region of country where irrigation is necessary has but a small average rainfall, and this rainfall is very unequally distributed over the land. It is concentrated chiefly along the great highlands—the plateaus and mountains which rise above the plains and valleys. The highlands where the great body of precipitation occurs are not properly agricultural lands as has been previously set forth, and if they were would not need irrigation; but in this elevated region where the rains fall the minor streams are found and the rivers have their origin, and to a very large extent all of these minor streams unite before the rivers themselves emerge from the highlands.

In general the rainfall on the lowlands where irrigation is necessary is so light that no perennial brooks or creeks are formed, and in general only large streams which come from elevated regions course through these lower lands, and these are the streams to be utilized in irrigating the lowlands. For this reason the agricultural region depends chiefly upon the utilization of the large streams.

II. The season of irrigation is in general in the spring and summer time when crops are growing, rarely more than three months all told. During the remainder of the year the waters run to waste unless reservoirs are constructed for their storage. In many cases people interested have already commenced their construction, and eventually the area of the irrigable lands will be largely increased by utilizing, through the means of reservoirs, the waters that flow in the non-irrigating season; for the reason that irrigation depends upon the large streams and the

construction of reservoirs, it is apparent that it can be developed only by the use of aggregated capital. It is probable that more than three-quarters of all the future redemption of land by irrigation will demand the expenditure of $1,000,000 or more in each enterprise. Under these circumstances it is unwise and impracticable to hold the irrigable lands for homestead settlement, except in the very limited instances previously mentioned. Poor men cannot make homes on the irrigable lands till capital intervenes for their reclamation; capital will not be invested in the redemption of the lands if it must wait for remunerative returns till the lands are settled by homesteaders after they are redeemed. To induce capitalists to invest in these enterprises, they must be permitted to have control of the land, and to seek their recompense in the great value given to previously worthless lands by their enterprise. For this reason it appears that the irrigable lands should be sold in unlimited quantities, subject only to the condition that the purchasers do actually redeem the lands by constructing the hydraulic works necessary thereto.

Should it be feared that this will result in a monopoly of the irrigable lands, it should be remembered—

I. That poor men cannot reclaim them.

II. That under the laws of inheritance prevailing in the United States, estates do not remain intact for many generations, but are speedily divided and subdivided.

III. That the agriculture carried on under conditions of artificial irrigation much more resembles horticultural than agricultural operations in regions of arable land. After a great outlay of capital in the reclamation of lands there is necessarily a great outlay of labor in their timely and constant irrigation. The minute streams must be trained along the rows of growing plants, or evenly flowed over small areas of levels, all of which requires minute supervision that every plant may receive its modicum of water, and agriculture under these conditions is most successfully prosecuted with small individual holdings, while large agricultural operations under these conditions carried on by the employment of many laborers cannot be made remunerative to capital. Hence it is that these great irrigating enterprises will be undertaken chiefly to secure the enhanced value given to the land.

IV. In the United States our people do not primarily buy lands as a profitable investment for money, but chiefly to establish homes, and everywhere land is and always will be worth more for a homestead than for a speculative business. Hence men will seek rather to invest their money in enterprises that will yield greater returns.

On this theory the chapter relating to irrigable lands has been prepared.

There is, however, an alternative proposition. The general government or State government may itself construct the hydraulic works necessary to the reclamation of these lands, and own and control them in such a manner as to derive a revenue from the sale of the water. Such is the method often adopted by other governments, but such a method is not in consonance with the traditions of the American people, but is utterly opposed to the prevalent theories of wise legislation. It would require the establishment of a vast irrigating department with an extensive retinue of officers and the appropriation of many hundreds of millions of dollars. It would therefore seem wiser to invite enterprise to these undertakings, and indeed capitalists have not shown an unwillingness to undertake the redemption of these lands, but hitherto they have been greatly fettered in their enterprises from the fact that they could not freely obtain titles thereto. Should the recommendations

of the commission on this matter be accepted by Congress adequate opportunities for the purchase of irrigable lands will be furnished and this industry will at once be pursued with vigor.

PASTURAGE LANDS.

In the vast area described in the last chapter as being so arid as to require artificial irrigation for successful agriculture but a small portion of the land can be irrigated. When all the streams are utilized to their utmost extent by the construction of reservoirs so that the rainfall of the entire year is saved, there will yet be but a small per cent. of the lands redeemed. Vast areas many times greater than all the irrigable lands will remain to be utilized for other purposes. The most elevated portion of the country—the mountains and high plateaus—bear timber of commercial value; but between the lowlands along the larger streams, and the highlands covered with forests, there are many millions of acres of value only for pasturage purposes. These grazing lands are so scantily clothed with grass that persons accustomed only to consider lands of arable regions would suppose them to be worthless; but experience has shown that the grasses which they support are valuable. They are found to be exceedingly nutritious by reason of the great burthen of seeds which they bear. Climatic conditions make them further valuable in that the meager precipitation of moisture, as rain and snow, does not beat them down and bury them in the soil, but they are left to stand during the winter to cure, forming an uncut hay. Thus it is that winter pasturage on such land is considered valuable, and will richly support herds and flocks throughout the entire year even to the northern boundary of the United States without resorting to any other supply of food than that furnished by the grass standing on the ground. The fact that flocks and herds can thus be sustained without any other supply of food has already attracted a great number of persons into this pasturage industry, so that the greater part of all the pasturage region as above described is covered with all the horses, cattle, and sheep which it will sustain. Millions of animals now roam over these lands, multiply, grow, and fatten, with no other care than to be collected periodically and branded, shorn, or driven to market. While these pasturage lands are already to so large an extent supporting thousands of people, yet the lands remain in the possession of the government, the laws for their disposal being such that no practical method is presented by which these pastoral people can obtain proper titles thereto. The only method of obtaining title heretofore has been by homestead settlement, as the lands were not of sufficient value to warrant their purchase by scrip. As the people cannot obtain title to the lands, permanent settlements are rarely made. To the men living on the government land who raise stock by pasturage thereon no inducements to local improvements are presented. Homes are rarely found. The owners of stock and their herders live in wagons, tents, or temporary cabins; schools are not organized, churches are not built, highways are not constructed, and many of the institutions so intimately connected with the best interests of civilized society fail to be established. If these lands are to be occupied by permanent settlers, and the institutions of modern civilization founded, some new method of disposal is imperatively demanded.

In the adoption of a proper method adequate to the fulfillment of the requirements thus indicated the following conditions must be observed:

I. The lands must be disposed of in quantities sufficient to the establishment of a home.

II. The price of these lands must be fixed so low that men can afford to take them solely for pasturage purposes; that is, the farm unit must be large and the price of the farm must be reasonable.

After the most thorough investigation possible for the commission to make, the conclusion has been reached that the farm unit should not be less than four square miles. It is not believed that this would on a general average be equal to 160 acres of arable land, but for the best of the pasturage land this equivalence may exist, and when the better tracts are taken it may be found wise to increase the farm unit. The reasons which have impelled the commission to recommend that arable lands be disposed of only as homesteads have led to the further recommendation that the homestead principle be also applied to these lands, modified only to that extent necessary for the successful settlement of such lands. Provision has been made for the acquirement of single homesteads and also for the acquirement of colony homesteads analogous to the provisions for the acquirement of homesteads on the arable lands. It is believed that the colony method will be best adapted to the pasturage lands and will be the method to which the pastoral people of that country will chiefly resort. When these people desire to make permanent homes they will wish to have society and the institutions of civilized life that can be established only by social co-operation, and these advantages can be secured only by resorting to the colony homestead plan, for if the pasturage farm unit must be four square miles, homes will be thus separated by long intervals from each other. Schools, churches, roads, and all local public improvements will be impossible—social conditions from which the American people will shrink. Again, homes on the pasturage lands will be more prosperous when such homes have attached to them small tracts of irrigable lands where gardens and small fields may be cultivated, but irrigation will itself require associated capital or co-operation in labor for its successful accomplishment, and such irrigable tracts can only be successfully cultivated by poor men establishing homes on the colony homestead plan. The effect then of this colony plan will be twofold. First. The settlers will be enabled to acquire titles to small tracts of irrigable land and by co-operation redeem them; and second, homes will be so grouped in villages that society and social institutions and conveniences will be possible.

As the pasturage lands are already largely occupied, if this system meets the approbation of the pastoral people who are already in the country, these lands will speedily be taken up, but if this method should prove inadequate to their wants, or for any reason be so objectionable as not to meet that favor necessary to secure the establishment of pasturage homes, a few years' experience will be sufficient to demonstrate such inadequacy, and a method of reducing the price of these lands by time graduation will in a few years result in placing them in such a condition that they can be purchased at a proper valuation. A graduation act applied to arable lands would not secure just results. The market value of land in an unsettled country bears no relation to its intrinsic value. It acquires market value solely by the progress of settlement, and it is only after it has thus acquired a first market value that such value is affected by intrinsic qualities. Hence a graduation act would have the effect of disposing of the lands to the settlers in later years at prices less than in earlier years, though such land sold in the later years might equal in value the lands sold in earlier years at the time of their sale by the government. Thus a graduation act applied to such lands

would simply result in discriminating against present settlers in favor of future settlers.

But this argument against a general graduation act could not be properly urged against one specially applicable to pasturage lands, for these lands are already occupied and have a marketable value, though that value is small and depends far less upon the progress of settlement with proximity to lines of transportation than upon the qualities inherent in the lands themselves, for they will produce no agricultural crop, no forests can be grown thereon, and their value depends solely upon the number of animals they can support; and the value of these animals, unlike the products of field culture, is but slightly affected by means of transportation. Hence the graduation act applied to the pasturage lands would secure proper results and substantial justice to the settlers thereon.

SALE OF TIMBER.

By the proposed classification of public lands "all lands, excepting mineral, which are chiefly valuable for timber of commercial value for sawed or hewed timber, shall be classified as timber lands."

By this classification all timber-bearing lands which are mineral or agricultural, and all lands bearing timber which does not possess value for sawed or hewed timber, are excluded from the classification as timber lands.

Timber lands, as thus defined, comprise a comparatively small area. In Arkansas, Louisiana, Mississippi, Alabama, and Florida, but little, if any, lands will fall under the classification.

There may be small areas in Michigan, Wisconsin, and Minnesota, which should come under the classification, but the existence of such tracts is a matter of doubt, and consequently the classification will probably only include lands in the Territories and Pacific States.

In presenting a proposed law for the sale of timber and the retention of the soil, it becomes necessary to give, as briefly as may be consistent with the importance of the subject, the reasons for the departure from the custom of selling the soil.

The most valuable timber in the Territories, and in the States on the Pacific coast, grows upon lands possessing very little, if any, value for agricultural purposes.

Large areas of the land in the Territories and Pacific States are either known or supposed to be more valuable for minerals than for any other purpose. Where the mineral character of the land is known, it is, of course, sold as mineral, without regard to the value of timber.

The rate of consumption and the destruction of timber by fires in the United States have been so great during the past twenty-five years as to cause alarm, not only on the part of thoughtful men at home, but in all countries not producing timber supplies equal to their wants.

The area of timber land, according to the classification, is small, and its retention by the government neither withdraws nor withholds agricultural lands from settlement.

The commission is of the opinion that the provision for the sale of the timber upon alternate sections only, and reserving all which is less than eight inches in diameter, as well as the fee in the soil, will result in the maintenance and reproduction of the forest. The experiment is at least well worth trying.

Referring to the necessity for the legislation recommended, or some other, it is proper to say that much difficulty is encountered in trying to suppress depredations upon the timber on the public lands. The

difficulties arise from a variety of causes, chief among which has been and still is the impossibility of purchasing, in a straightforward, honest way from the government, either timber or timber-bearing lands.

Until a very recent date, no public lands in the States of Arkansas, Louisiana, Mississippi, Alabama, or Florida could be procured in any other manner than by a compliance with the homestead law. This condition of the law was the primary cause of thousands of fraudulent homestead entries. It was no uncommon thing for one person or one firm engaged in the timber or turpentine trade to procure to be made large numbers of homestead entries with apparently no intention of complying with the law. So far as relates to the States mentioned this condition no longer exists, as the lands have all been brought into market under the act of June 22, 1876, and rendered subject to sale at $1.25 per acre at private entry, and consequently depredations on the timber in those States have, to a very great extent, ceased.

Until the passage of the act of June 3, 1878, entitled "An act for the sale of timber lands in the States of California, Oregon, Nevada, and in Washington Territory," there was no manner by which timber or timber lands in either of the States or the Territory mentioned could be obtained excepting by settlement under the homestead and pre-emption laws, and by the location of certain kinds of scrip and additional homestead rights, which cost several dollars per acre.

Settlements upon timber-bearing lands in the States and Territory mentioned in the act, under the homestead and pre-emption laws, are usually a mere pretence for getting the timber. Compliance with those laws in good faith where settlements are made on lands bearing timber of commercial value is well-nigh impossible, as the lands in most cases possess no agricultural value, and hence a compliance with the law requiring cultivation is impracticable.

The commission visited the red-wood producing portion of the State of California, and saw little huts or kennels built of "shakes" that were totally unfit for human habitation, and always had been, which were the sole improvements made under the homestead and pre-emption laws, and by means of which large areas of red-wood forests, possessing great value, had been taken under pretenses of settlement and cultivation which were the purest fictions, never having any real existence in fact, but of which "due proof" had been made under the laws.

In some sections of timber-bearing country where there should be, according to the "proofs" made, large settlements of industrious agriculturists engaged in tilling the soil, a primeval stillness reigns supreme, the solitude heightened and intensified by the grandier of high mountain-peaks, where farms should be according to proofs made, the mythical agriculturist having departed after making his "final proof" by perjury, which is an unfavorable commentary upon the operation of purely beneficent laws.

The law of June 3, 1878, is onerous, and ameliorates the condition existing before its passage but very little, if any; something further is necessary.

Another act was approved on the 3d of June, 1878, entitled "An act authorizing the citizens of Colorado and the Territories to fell and remove timber on the public domain for mining and domestic purposes," by the provisions of which settlers and other persons may take timber for mining and agricultural purposes from mineral lands.

The provisions of this law, when understood, mean but very little. *Timber may be taken from mineral lands.* Perhaps not one acre in five thousand in the State and Territories named is mineral, and perhaps

not one acre in five thousand of what may be mineral is known to be such. The benefit of this law to the settlers is better understood when these facts are known.

The whole subject-matter of existing laws in relation to the sale or disposal of timber-bearing lands may be briefly stated, as follows:

Timber lands in the States of Arkansas, Louisiana, Mississippi, Alabama, and Florida may be bought for cash by any persons in any quantities, or may be taken under the homestead and pre-emption laws.

In such parts of the States of Michigan, Wisconsin, Minnesota, and Missouri as contain public lands, which are at the same time agricultural and timber lands, the title may be obtained only under the homestead and pre-emption laws.

There is no way provided by law for disposing of lands which are chiefly valuable for timber of commercial value in those States, as it must be conceded by all that the homestead and pre-emption laws apply only to lands valuable for agriculture.

In the States of California, Oregon, and Nevada, and in Washington Territory, timber lands can be bought by certain persons, under certain onerous conditions, in quantities not exceeding one hundred and sixty acres.

In the States of Nevada (both the laws approved June 3, 1878, are applicable to this State) and Colorado, and in all the Territories except Washington, any person may cut and remove all the timber he may need for mining and domestic purposes from *mineral land*. This law, strictly observed, would not confer any benefit upon one in one thousand of the inhabitants. There is no other law by or under which timber or timber lands can be procured in the States and Territories last above named.

The population of two States and seven Territories should not longer be compelled by the laws of the country to be trespassers and criminals on account of taking the timber necessary to enable them to exist, as is the condition to-day, and as it has been, according to law, ever since settlements were commenced, or since the policy of selling lands for cash has been abandoned by the government.

If the bill proposed by the commission should become a law, timber upon agricultural lands may be taken with the land, under the homestead law; timber or pasturage land may be taken under the law for sale of pasturage land, and also under pasturage homesteads; and timber may be taken from any land not classified as timber or agricultural land by all citizens and others requiring its use. Under the chapter of the act referring specifically to the sale of timber, the timber upon alternate sections of the timber lands may be bought without the soil. These provisions, together with the law as it now stands in reference to the States of Arkansas, Louisiana, Mississippi, Alabama, and Florida, will place all the public timber land of the United States under laws for disposal to persons requiring it, excepting the timber upon alternate sections of the lands embraced under the classification of timber lands, and thus make it possible for all persons, in every part of the country, to get timber or timber land, and at the same time making some provision for the retention of the timber on a part of the land and the reproduction of it upon another small portion.

MINERAL LANDS.

The United States mining laws of 1866 and 1872 are directly descended from the local customs of the early California miners. Finding them

selves far from the legal traditions and restraints of the settled East, in a pathless wilderness, under the feverish excitement of an industry as swift and full of chance as the throwing of dice, the adventurers of 1849 spontaneously instituted neighborhood or district codes of regulations, which were simply meant to define and protect a brief possessory ownership. The ravines and river-bars which held the placer-gold were valueless for settlement or home making, but were splendid stakes to hold for a few short seasons and gamble with nature for wealth or ruin.

In the absence of State or Federal laws competent to meet the novel industry, and with the inbred respect for equitable adjustments of rights between man and man, which is the inheritance of centuries of English common law, the miners only sought to secure equality of rights and protection from robbery by a simple agreement as to the maximum size of a surface claim, trusting, with a well-founded confidence, that no machinery was necessary to enforce their regulations other than the swift rough blows of public opinion. The gold-seekers were not long in realizing that the source of the dust which had worked its way into the sands and bars, and distributed its precious particles over the bed rocks of rivers, was derived from solid quartz veins, which were thin sheets of mineral material inclosed in the foundation rocks of the country. Still in advance of any enactments by legislature or Congress, the common sense of the miners, which had proved strong enough to govern with wisdom the ownership of placer mines, rose to meet the question of lode claims, and decreed that ownership should attach to the thing of value, namely, the thin sheet-like veins of quartz, and that a claim should consist of a certain horizontal block of the vein, however it might run, but extending indefinitely downward with a strip of surface, on or embracing the vein's outcrop, for the placing of necessary machinery and buildings. Under this theory, the lode was the property, and the surface became a mere easement.

This early Californian theory of a mining claim, consisting of a certain number of running feet of vein with a strip of land covering the surface length of the claim, is the obvious foundation of the Federal legislation and present system of public disposition and private ownership of the mineral lands west of the Missouri River. Contrasted with this is the mode of disposition of mineral-bearing lands east of the Missouri River, where the common law has been the one rule, and where the surface tract has always carried with it all minerals vertically below it.

The great coal, iron, copper, lead, and zinc wealth east of the Rocky Mountains, have all passed with the surface title, and there can be little doubt that if California had been contiguous to the eastern metallic regions, and its mineral development progressed naturally with the advance of home-making settlements, the power of common-law precedent would have governed its whole mining history. But California was one of those extraordinary historic exceptions that defy precedent and create original modes of life and law. And since the developers of the great precious metal mining of the far West have for the most part swarmed out of the California hive, California ideas have not only been everywhere dominant over the field of industry, but have stemmed the tide of Federal land policy and given us a statute-book with English common law in force over half the land, and California common law ruling in the other.

Your commissioners have examined typical mining localities in all the far western States and Territories, studying the metalliferous deposits, the character and mode of developing the same, the titles on which ownership rests, and the lines of litigation which have governed the at-

tacks upon and defense of mineral property. It has been our main purpose in this branch of inquiry to determine how well the laws now upon the Federal statute-book convey into private ownership portions of mineral-bearing public lands, and how well the grantees of the government are enabled to hold, enjoy, and develop their properties. While in a large class of cases your commission finds that the law conveys definite rights and protects the grantees, in a far larger class it simply bequeaths a piece of paper and a legal contest.

We find an extraordinary and characteristic difference between the mineral development east of the Missouri and that west. The first is almost absolutely exempt from litigation growing out of conditions of the government conveyance. The other is a history of the most frequent, vexatious, costly, and damaging litigation.

While the total litigation concerning mineral titles in the great copper and iron region of Lake Superior is represented by a single suit, which turned on a conflict between two titles granted respectively by the State and the Government, the dockets of the far western courts are cumbered with an excessive number of suits, involving many million dollars of value. In that region the investor of capital too often buys only a lawsuit, with a possible mine thrown in, and finds himself forced to choose between an expensive legal defense of his rights or robbery. That the mineral industry advances and prospers in the face of the statutes is proof only of the wealth of the country, and the buoyant energy of the people.

There are two general features in the existing statutes which have provoked and directed the main lines of legal contest, and they are, first, the recognition by the law of the local customs and regulations; second, the attempted conveyance of a lode, ledge, or deposit of rock in place bearing mineral, as a thing separate from and independent of the surface tract of ground, with the permission to follow such lode or deposit on its dip, even when in the downward course it passes beyond the side lines of the surface claim.

The law leaves all the conditions as to location, notice, record of location and area of claim within certain wide limits to local regulations. That is to say, the government proposes to convey a portion of its public land, and bases the very origin and initiation of that conveyance on the acts of an official wholly outside its jurisdiction.

Title after title hangs on a local record which may be defective, mutilated, stolen for blackmail, or destroyed to accomplish fraud, and of which the grantor, the government, has neither knowledge nor control. In the testimony taken by your commission it was repeatedly shown that two or three prospectors, camped in the wilderness, have organized a mining district, prescribed regulations, involving size of claims, mode of location, and nature of record, elected one of their number recorder, and that officer on the back of an envelope or on the ace of spades, grudgingly spared from his pack, can make, with the stump of a lead pencil, an entry that the government recognizes as the inception of a title which may convey millions of dollars.

From such extreme cases, frequent as they have been, there is a wide range of organization to the duly-elected county recorder, but even that official, who represents the most favorable working of the system, is not responsible to the United States. He is neither bonded nor under oath. He may falsify or destroy his record; he may vitiate the title to millions of dollars' worth of claims, and snap his fingers in the face of the government. All the local officers are made indirectly the agent of the

government at the critical stage of a vast class of transactions without an iota of responsibility or a syllable of instruction from the principal.

It is true that the statute of 1872 does not make a record obligatory nor does it define its effect. Miners at their meetings might draw the provisions of their code without mention or requirement of record, but practically they exercise the privilege which the statute does not inhibit, and create a record. Having, as is universally the case, made the record a part of their code, the Federal law, having recognized and enforced the code, is thereafter bound as to its conveyances by the record with all its preposterous seeds of harm.

Such Federal law and such a state of affairs as the law plainly necessitates would, it might be supposed, cure itself. The burden of litigation, the uncertainty of ownership, and the actual loss of property, should have long ago brought the mining people to a realization of the damage wrought by local records; but unfortunately the class of men who own our mines, fight the great costly lawsuits, and discover the absurdity of the law, are not the class who make the locations. The prospector's sole attempt is to follow the custom of other prospectors, make his location as other locations have been made since the golden days of early California, and sell out to a capitalist.

If the capitalists of London and New York, Chicago and San Francisco, had anything to do with mine locations, they would clamor for a change.

The continuance of this early practice, which has survived not only its original necessity and usefulness, but every semblance of value, is perhaps due more than all other causes to the excited, sudden, and transient character of the industry. The immediate returns, the movements of the stock-board to-day, the swift conversion of bonanza into bullion, are the points which absorb men. Permanent ownership and security of tenure are less considered. Like a great wheel of fortune, the dazling prizes blind men to the sober legal conditions on which security depends, and, as a result, no branch of American enterprise has ever paid to litigation so great and so unnecessary a share of its gross returns.

One of the ablest jurists who has administered the mining laws, Chief Justice W. H. Beatty, of Nevada, argues conclusively that the local records are of no practical value, and hence there is absolutely nothing whatever to weigh against the crying evils which their continuance entails. On page 398 of the book of testimony, he says:

> It thus appears, if the foregoing statements are correct, that upon three out of four points, subject to local regulation by the miners they make no use of their privilege, and that the regulations which they do make on the fourth point (namely, record), having no reason to support them, are simply useless and vexatious. If this conclusion is well founded, my first proposition is established, that the whole subject of lode locations is so simple that it not only may be, but actually is, fully regulated by act of Congress. That the right of local regulation ought to be taken away if it is of no practical valne, is a plainer proposition than the first. The interest of the public would be subserved by cutting off a source of endless litigation, and the mining communities would be especially benefited by the enhanced value of mining property.
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> The magnitude of the evil resulting from the uncertainty of mining titles will, perhaps, be appreciated, when I say that after a residence of seventeen years in the State of Nevada, with the best opportunities of observing, I cannot at this moment recall a single instance in which the owners of really valuable mining ground have escaped expensive litigation, except by paying a heavy blackmail.

Besides the worse than useless permission to prescribe a record over which the government has no control, the law of 1872 leaves but two points which may be regulated by local organizations. It fixes the maximum dimension of the claim or thing granted, and it fixes the

minimum requirements of survey, development and payment upon which the claim may pass to the grantée.

Within these narrow limits is all the room left for local regulation. Miners may voluntarily limit their privilege of mineral pre-emption to an area less than the statute offers them, or they may require of themselves conditions more onerous than the law demands. With his eyes open the American citizen is somewhat unlikely to do either.

Your commission find that a large majority of the mining men consulted during the examination of the Western States and Territories clearly shared our conviction: first, that the local regulations are of no use; secondly, that they are a great positive harm; thirdly, that by Congressional enactment they should be promptly abolished as to all future locations.

Accordingly, in the code of legislation submitted herewith, it is directly provided that "all future occupation, location, or purchase of public mineral lands shall be governed by laws of Congress, to the exclusion of all local customs and regulations and State and Territorial law" (section 172); and a mode of location is prescribed which requires all the acts necessary to pass title for public mineral lands from government to the purchaser, to be performed by the locator, his assign or agent, and the duly bonded and qualified officers of the United States.

The second great class of evils which our proposed law has sought to cure are those incident to the theory of the lode or ledge location. This outgrowth of the early Californian practice stands thus in the statute of 1872:

SEC. 2322. The locators of all mining locations heretofore made, or which shall hereafter be made on any mineral vein, lode, or ledge situated on the public domain, their heirs and assigns, where no adverse claim exists, on the tenth day of May, eighteen hundred and seventy-two, so long as they comply with the laws of the United States, and with State, Territorial, and local regulations not in conflict with the laws of the United States governing their possessory title, shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically, although such veins, lodes, and ledges may so far depart from a perpendicular in their course downward as to extend outside of the vertical side lines of such surface locations; but their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward as above described through the end lines of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges.

The grant therefore consists, first, of a definite surface tract, which, if properly marked, need never become a subject of dispute; and, secondly, of all veins, lodes, and ledges without limit as to depth or departure beyond the side lines of the surface location, whose tops or apices lie inside the prism of earth bounded by vertical planes through the exterior boundaries.

But the lodes which are to be followed are not definite or limitable, and in the book of testimony Judge Moses Hallett, of Colorado, in a clear exposition of the impossibility of describing or identifying a lode, which is the valuable thing granted, remarks:

It is safe to say that the greater part of the legal complications for which mines are notorious over all other property, grows out of the practice of dealing with lodes as distinct and severable from the earth in which they may be found. In condemnation of that policy it is only necessary to say that very many lodes have not that character, and of those that are pretty well defined it is often difficult and sometimes impossible to distinguish one from another. If we can return to the common-law principle which gives to the owner of the surface all that may be found within in his lines extended downward vertically, we should avoid hereafter fully one-half the controversies that now embarrass the mining interests of the country.

It has proved in practice and in law that a lode or ledge is an absolutely indefinite thing, and the act of following this formation whose nature and limits cannot be fixed beyond the locator's surface ground and under the surface ground of another owner, is the most frequent and vexatious cause of litigation.

The right of a locator to thus follow a lode into the ground of a second party works its minimum of mischief in the case of a well defined fissure vein of regular course and dip, the mineral material and walls of which clearly define it from the surrounding rock, and which, by its smooth unbroken continuity from a visible apex or outcrop upon the surface down to its lowermost workings, show plainly the unity of the whole formation. In such cases, if attacked at law, the locator would in the end be able to prove that the ore or vein which, at the bottom workings, lay under the surface claim of a second party, was in truth the lode or ledge whose apex lay in his own ground and was the one granted to him.

With such a defined fissure vein, by spending many thousand dollars and provided his cloud of expert witnesses are not tripped up by clever cross-examination, and the judge is impartial, and the jury are not corruptly influenced against him, after many months and perhaps years, during which his enterprise has been handcuffed with injunctions and himself reduced to poverty, the owner might derive whatever hollow comfort he could from a victory which left him ruined.

From this somewhat favorable working of the law, your commission have gone on to the examination of another class of cases, in which the lode was not a simple fissure easily recognized at its apex, clearly defined from the inclosing rocks, and continuous without change or break, but a complex and indefinite body, without apex, so merged with the surrounding rock that its limits could not be fixed by science, and so extensive that no one surface claim could cover its outcrop, if it had one.

Ore deposits may be horizontal sheets interstratified with sedimentary beds. They may occur as scattered impregnations of metallic minerals, disseminated without connection or system through broad zones of rock. They may consist of a main central ore body, with small dependent bodies, connected with the parent mass by minute threads or seams of vein material, or ore, so that one discoverer locates on the apex of the main body, and another locates on the apex of a dependent body. Both trace their way downward into a single ore chamber, each having honestly followed ore all the way from his "apex." In such cases murder sometimes, litigation always, ensues. Again, some ore deposits are so extensive and broad on the surface that two or more parallel claims may be located side to side across the outcrop; each has an apex, to each the government solemnly conveys his lode. On mining downward all find themselves in one lode, which rapidly narrows to the thickness of a sheet of paper, and contest ensues. This latter case might seem an inexpensive one to demonstrate, but on the "Comstock Lode" it cost three millions disbursed in litigation, and ten millions in underground development. The above cases, and others too numerous and complicated to adduce here, are the causes of innocent and unavoidable conflict, where, owing to the character of the deposit, the law brings honest neighbors to the point where they discover that the government has seriously sold them both the exclusive right to the same thing, and the courts have forced one honest man to rob the other.

But there is still another, and, unfortunately, a lamentably numerous line of cases where the government sells a lode to one man, and by its

laws invites a general, a frequent, even a promiscuous blackmailing and robbery of its grantee.

The existing law provides no administrative control over inspection of the alleged discovery. The mere location and record of an alleged lode give valid possessory title whether there really is a lode or not, for it is never questioned till the proceedings for patent, and even then the existence of a lode is determined by *ex parte* affidavits without official inspection.

The line of adverse proceedings is this: One man locates an honest claim on the evident apex of a true lode. Fifty or a hundred tramps locate claims all around him and over him, burying his tract deep with thickly stratified possessory titles. Not one of the tramps has discovered a lode; he has simply marked out a piece of ground and paid the recorder's fee, bestowing some name upon his imaginary discovery. The tramp's claim is obviously valueless for working, but he is in a position for a fee of five dollars to mine without the cost of muscle or plant. And where? Not on his alleged lode, but in the already coined earnings of his neighbor, the honest discoverer.

The blackmailer's method is simple and effective. Located over the dip of the honest discoverer he has only to say to him "It will cost you less to pay than fight."

The robber's method is somewhat bolder and less certain of success, but his prize is greater. He sinks through his worthless claim and cuts the honest locator's veins where, in the language of the law, they "so far depart from a perpendicular in their course downward as to extend outside the vertical side-lines" of the honest claims. The honest miners are then in the hands of justice, which means injunctions, trials, expert testimony, juries, and an abominable waste of money.

Your commission, after a review of the lines of mining contests and a consideration of the complex nature of ore deposits, are unanimous in the conviction that any attempt on the part of the United States to convey such deposits as individual things beyond the vertical planes bounding the surface claim, must always end in a history of intolerable injustice.

The result of our test of public opinion shows that, while there are regions whose simple fissure veins have not caused battles, and where, consequently, the people ask no change, the majority of experienced mining men desire a change from the lode location, with its disastrous sequel, back to the security and peace of the solid old common-law doctrine. It is urged by opponents of this doctrine that this limitation will discourage deep mining. On that score we invite your attention to the following opinion. The Great Bonanza firm, after due reflection, submitted their views to your commission through their counsel, Judge B. C. Whitman, of Virginia City. His exposition of the operations of mining law is to be found on page 419 of the book of testimony. As a summary of his views on the subject of locations he remarks on page 421:

> I think the square location (*i. e.*, common law) would have no injurious effect upon deep mining; on the contrary, I think it would improve it, have a good effect, always provided that the United States survey and fix the monuments. A man could go in there then feeling that he owned that piece of ground, and I think every prospector would be willing to avail himself of that, and go to work on that supposition. The history, so far as I know, of every mine and mining company is continued litigation and expense by adverse locations. With a square location there could be no litigation. Mining men would be more willing to invest in a square location than they would in what we call ledge locations.

Subterranean rights are terminated by vertical plains carried down-

ward through the end lines of the claim. But in a very large class of ore deposits, the valuable bonanza or pay chimney does not descend on the line of the dip, where it may be legally followed beyond the side lines, but rakes off at a sharp angle and the ore chimney passes out through the plane of the end lines, where the owner cannot follow it. In such cases, he stands precisely where the common law would place him.

Again, if, as is often the case, the course, and hence the dip, are not discoverable on the surface where the location was made, a man lays out the length of his claim, as he supposes, on the strike of the lode, and draws his side lines where he supposes the valuable deposit will pass out of his surface, giving the right to him to follow it; but on mining down, perhaps for years, he finds that he was mistaken, and the whole vein, instead of dipping through his side line, dips through the end line, and the courts have held him to his unavoidable mistake.

The existing law holds out the conditions for obtaining patents. Having permitted an inception of title dangerously vitiated by acts of local agents outside of the Federal jurisdiction, having permitted a lode location with its indefinite conditions, having permitted the robbers and blackmailers to acquire a cheap and secure fighting title, the government then causes its unfortunate victim to set himself up as a target for attack by advertisement for patent, and when attacked calmly turns its back and permits him to be dragged into the local courts.

In short, the present law might be fitly entitled "An act to cause the government to join, upon unknown terms, with an unknown second party, to convey to a third party an illusory title to an indefinite thing, and encourage the subsequent robbery thereof."

Briefly, miners' laws and customs were initiated from necessity, and in the absence of legislation. They naturally dealt mainly with the mineral to be extracted. The essence of their laws related to the lode. There was room enough for all, and the surface ground was not regarded as a definition of claim, but as an easement for the convenient working of the mineral beneath its surface.

As the mineral domain became occupied, conflict of locations naturally ensued. The necessity for some precise definition of rights then followed. Congress, however, simply acquiesced in the loose customs which had sprung from the necessity of frontier explorations in the absence of legislation. The definition of rights and the harmonizing of conflicting and obscure customs were remitted to the construction of the courts. Precisely as the railroad law of the country has, in the absence of legislation, grown out of the application by the courts of the law of common carriers by wagon and by boat, to the great lines of railroad traffic, so the courts have been compelled to apply the varying customs of innumerable local districts to the increasing complications and development of a national mining industry. It has resulted that the surface location has by construction become the controlling factor, and the miner often loses his lode when in its course it departs therefrom.

The Helen Tarbut decision by the Supreme Court of the United States lays down the latest rule of construction. It is not an unfair criticism to say, that, by judicial construction, the old miners' theories are, in partial and fragmentary form, being reduced to a quasi application of the common-law rule.

The commission has thought that the time has arrived when Congress should formulate the legislation to govern the changed conditions of an occupation which has passed from a frontier experiment into a national industry.

If mining is to be continued as an experiment, or for speculative purposes alone, an adherence to the existing customs is desirable. If it is to be continued as a business, upon settled principles and with expectation of legitimate returns, it should be governed by the same rules which the wisdom of centuries has formulated for the definition of all real property titles.

The insecurity and hazard of the first system could be well followed by a continued relinquishment of Federal control over its own property, both in the inception of title and in the adjustment of controversies.

The certainty and security of the second system should be maintained by an assertion of the national jurisdiction over its own property in all stages of progress, until the title is vested in private ownership.

In the new law submitted for the consideration of your honorable body, we have attempted to preserve all the valuable and practicable provisions of the present statute, and sought to cure all its flagrant wrongs.

We have protected the prospector for an ample time to test his discovery, but we have fixed a limit to his possessory title; and thereafter, failure to tender purchase money shall work a forfeiture of the claim.

We have in terms abolished all the local organizations and regulations, reserving to the United States full jurisdiction over all questions, from location to patent.

We have repealed the lode location, and substituted the common-law rule in its stead.

We have, by a system of official survey and mineral inspection, prevented blackmail and robbery, and obviated those contests which necessitate the intervention of the courts before patent.

Providing thus for all questions of legal principle, there is one point, namely, the area of the common-law claim, on which we have made no recommendation. The limited time allowed for our taking of testimony as to this point has left us without a full expression of popular opinion, and we remit that question to your legislative judgment.

PRIVATE LAND CLAIMS.

So far as concerns all private land claims situate in any cessions from foreign governments outside of the boundaries covered by the treaty of Guadalupe Hidalgo and the subsequent Gadsden purchase, the commission has but one recommendation to submit. Numerous acts of Congress have, from 1806 to 1872, inclusive, granted indemnity scrip for confirmed private land claims, wholly or partly lost by non-location, or conflict with other claims, entries, or rights, or reduced by deficient surveys. Most of these acts were temporary or local, or both; but an act of Congress, approved June 2, 1858 (Stat. at Large, vol. II, pp. 294–5), made general provision for all claims confirmed by Congress before that date and then remaining unsatisfied. The ascertainment and satisfaction of the claims therein provided for was placed within the jurisdiction of the executive officers of the United States; but as the questions involved are purely legal, the commission recommend a transfer of the jurisdiction to the Federal courts. The General Land Office would then be restricted to issuing such scrip only upon judicial confirmation. This will not impair such rights as may have vested under past laws, but it will provide a safer and more satisfactory mode of ascertainment. This recommendation is formulated in sections 221 to 223, inclusive, in the accompanying bill.

The commission has no recommendations to make concerning private

land claims in that part of the cessions from Mexico which fall within the State of California. The laws governing the confirmation and the segregation of these claims have been so far executed that very few claims are unsettled. So far as we are advised, none of these claims are pending in the courts upon the confirmation of title, and but thirty-seven have not been finally adjudicated upon the question of survey. Even as to that limited number, most of them have been surveyed by the government, and the questions incidental thereto are rapidly approaching a final settlement. Whatever views we might have desired to submit if the question was *res integra*, there is no subject-matter to which new legislation by Congress would be applicable.

Sections 206 to 219, inclusive, of accompanying bill embody our recommendations at to the private land claims within the cessions from Mexico by treaty of Guadalupe Hidalgo and the Gadsden purchase, but exclusive of the State of California. These sections are literal transcripts of a bill introduced in the Senate during the present Congress by Hon. George F. Edmunds.

In California, Congress, by the acts of March 3, 1851, June 14, 1860, July 1, 1864, and July 23, 1866, provided machinery for the ascertainment and settlement of these claims which has resulted in their final confirmation or rejection, and in their subsequent segregation from the adjacent public lands. Questions of title were settled by the Federal courts, and authority to segregate claims judicially confirmed was vested in the proper executive officers of the United States.

But in the remainder of the territory derived from Mexico a different mode from settling private land claims was prescribed. The basis of such settlement is the eighth section of the act of July 22, 1854, which made it the duty of the surveyor-general to "ascertain the origin, nature, character, and extent of all claims to lands under the laws, usages, and customs of Spain and Mexico," and to report his conclusions to Congress for its direct action upon the question of confirmation or rejection. The law was singularly defective in machinery for its administration, and it imposed no limitation of time in the presentation of claims, and no penalty for failure to present. Its operation has been a failure amounting to a denial of justice both to claimants and to the United States. After the lapse of nearly thirty years, more than one thousand claims have been filed with the surveyor-general of which less than one hundred and fifty have been reported to Congress, and of the number reported Congress has finally acted upon only seventy-one. Under the law, only copies of the original title papers were submitted to Congress, and it is not presumed that its committees are so constituted as to make safe judicial findings upon the validity of titles emanating from foreign governments, nor to measure the area of claims whose boundaries rest exclusively upon meager recital of natural objects in terms of very general description. As a consequence the committees of Congress have naturally been reluctant to act with insufficient data upon questions which involved the functions of the judge rather than of the legislator, and as these claims have heretofore pertained to a semi-foreign population in a comparatively unsettled portion of our Territories, business of more importance to the general welfare of the nation has been permitted to exclude these local matters from regular consideration. In the limited number of cases finally confirmed, Congress has been compelled to confirm by terms of general description, which have usually proved to include much greater areas of land than Congress would knowingly have confirmed. The established rule of area under the Mexican colonization law was a maximum of eleven leagues to a claimant, being

a little less than 50,000 acres; but as illustrations of the natural result of confirmation without proper judicial investigation, one confirmation by Congress to two claimants has proved to embrace 1,000,000 acres and another about 1,800,000 acres.

The time has arrived when the States and Territories, containing these treaty claims, are no longer on the frontier, and they have ceased to be populated exclusively by a foreign population. Lines of transcontinental railroads are piercing them in every direction; the restless activity of American civilization is spreading towns and farms over the plains, and has exposed the hidden treasures of the mountains; emigration is flowing in with magical rapidity, and industry and thrift are exploring every avenue for development and investment. But at the foundation of all permanent growth lies the security and certainty of land titles, and no discussion is required to prove that this is unattainable in communities, covered with claims to title of foreign derivation, and of unascertained boundaries. Even the government is ignorant of the line of demarkation between its public lands and these treaty claims, and uncertainty and insecurity taints the titles of its purchasers. The sections proposed in our law are intended to cure these evils, and to provide a practical and speedy mode of settling these claims to title. The eminent source, from which the commission has copied its recommendation, inspires us with great confidence in the sufficiency of the remedy proposed. It is in substance, a judicial determination of the validity of the claims, with bar for non-presentation within a prescribed period, and a compulsory segregation after confirmation.

The experience of California has, however, demontrated that in the lapse of years, during which the United States have slept upon the fulfillment of these treaty obligations, many of these claims have passed into the hands of innocent purchasers for valuable consideration. Cases will doubtless occur, when the title of their grantees will be rejected, or the lands so purchased will be excluded from the final survey of the grant. It was deemed simple justice to give such grantees a preference right to purchase from the United States at $1.25 per acre, to the extent of their actual possession, according to the lines of their original purchase, and section 220 is recommended to that end. It is simply a literal enactment as general legislation of section 7, of the act of Congress of July 23, 1866, and applicable only to California. It has operated with extreme beneficence in the State, and its principle should be equally applied to any other locality, wherein the same conditions exist.

STATE SELECTIONS.

The eighth section of the act of September 4, 1841, granted to named States and to "each new State, that shall be hereafter admitted into the Union," 500,000 acres of land for purposes of internal improvement. All other grants of public land to States were either restricted to States in the Union, or were contained in the enabling acts of the several States, or in special grants. Nevertheless, controversies have arisen before the executive department as to the right of new States to grants, which were in express terms restricted to States in the Union at date of the granting act; as, for illustration, the swamp grant. Such claims have been uniformly denied, but as the denial rests upon *executive* decision it was deemed wise to recommend a direct expression of the legislative intent. Section 224 is purposed to that end, and is in accord with the decisions of the executive department. It leaves to Congress the determination of the grants, to which States hereafter admitted shall be entitled.

Section 225 re-enacts the rule of indemnity fixed by act of Congress approved May 20, 1826, and which has since prevailed without amendment.

Section 226 is recommended to cover omissions and defects in existing legislation governing the conveyance of title to the States in the matter of their several grants of land from the United States. The General Land Office has always denied its power to issue patents for land except when thereunto specifically authorized by acts of Congress. When named tracts were granted, like the sixteenth and thirty-sixth section grant for public schools, no evidence of title whatsoever was given to State. The granting act passed the title *proprio vigore*.

When the grant was to be taken by selection, the practice grew up of preparing lists of such selections for the approval of the Secretary of the Interior. The originals thereof were retained in the General Land Office, but without record; and copies thereof were transmitted to the governors of the States interested. Such States received no other evidence of title from the government. The insufficiency of this system became so apparent, and yet it had by lapse of time become so general, that by act of August 3, 1854, Congress prescribed that such lists should be construed to convey the fee simple title, but with the limitation that "where lands embraced in such lists are not of the character embraced by such acts of Congress, and are not intended to be granted thereby, said lists, so far as these lands are concerned, shall be perfectly null and void, and no right, title, claim, or interest shall be conveyed thereby." This provision has always been embarrassing. It taints State titles with a supposed infirmity, which is aggravated by the lapse of time. No good reason is apparent why the executive should not be required to ascertain that the State is entitled to lands before the fee should be conveyed from the United States; nor when the conveyance is made, why it should not be in the ordinary form by patent to be made of proper record. It would involve too much outlay for clerical service to reform this as to past certifications; but the commission recommend that the evil be cured for the future. This anomalous form of listing without record has heretofore, in connection with other causes, led to careless adjustments of these grants, whereby it has resulted in one State at least that illegal certifications have been made and in excess of the grants. Many thousands of acres have thus been nominally conveyed to the State, for which there was no authority of law. The decisions of the Supreme Court in Moore *vs.* Robbins denied the power of the executive to issue a second patent until the outstanding deed should have been judicially avoided. This decision has been construed by the Interior Department to apply to these State certifications. It results that whilst the holders of these State lists have no valid title, they are excluded from acquiring in some other form valid title from the United States, and the operation of the public-land laws are suspended as to these lands thus unlawfully listed. They are suspended like Mahomet's coffin, awaiting a suit to determine their patent in validity, which suit the United States can alone bring, but with great expense and delay. The second proviso to section 226 vests the General Land Office with clear power to adjust this matter, and, in the absence of valid adverse rights, gives a preference right of purchase from the United States to innocent purchasers under color of title from such illegal certifications. The provision is confidently recommended with the approval of the General Land Office as a satisfactory and equitable solution of a vexed question, affecting large bodies of the public lands.

BOUNTY LANDS.

Inasmuch as the laws governing this title relate exclusively to the past, and effect in future only the adjustment of rights heretofore accrued, the commission has not proposed any change in the existing law, as found in chapter 10 of title 32 of the Revised Statutes.

MISCELLANEOUS PROVISIONS.

The importance of the mining *débris* question is set forth in the testimony accompanying this report. It will appear therefrom that a serious and increasing conflict exists in California upon this subject between the miners and the agriculturists. It would also seem to be a question falling within the legitimate scope of Congressional action. The United States still own forty per cent. of the lands in that State, a large portion of which contain minerals. Facilities for running off their tailings are indispensable to the successful working of these mines; and the government could scarcely expect to sell the same to purchasers, and yet deny the necessary conveniences for their operation. But it is claimed that such unrestrained *débris* facilities destroys the agricultural lands on the lower portions of the streams, and that by the shoaling of rivers and bays navigation is being destroyed and commerce restricted. It should be satisfactorily determined whether these allegations of fact are true; and, if so, whether there is an appropriate and just remedy This commission has enjoyed neither the requisite time nor facilities for an intelligent solution of this important question; and it is not clear that it falls within our jurisdiction. But it is so closely allied to the future disposition of the public domain in mineral localities, and it is of such growing importance, that we feel warranted in recommending the creation of a properly-organized commission, clothed with authority to ascertain the facts, and to propose to Congress an adequate remedy for any evils they may find to exist, which shall settle this vexed question with even-handed justice to all parties interested.

Sections 260 to 262, inclusive, are literal enactments of the existing law.

Section 263 is a condensation of sections 2369, 2371, and 2372 of the Revised Statutes; and section 264 is a substitute for Revised Statutes 2370. It adds to existing law the authority to reissue patents, "when necessary or proper, to correct errors in description, or in names of parties, or in other material particulars." It seems singular that no such authority has heretofore existed, and its absence has been a serious embarrassment to the Land Department and an annoyance to patentees.

Section 265 prescribes a method of fixing, under our proposed system of classification, the price for sale of released reservation lands.

Sections 266 to 268, inclusive, cover the matter of repaying purchase money where the United States refuse to convey to the purchaser. We have put the matter upon the broad proposition that when the government refuses to give the citizen an equivalent for his purchase money, it should be refunded to him, and the parties to the canceled contract be put back exactly into their original position. The appropriation for this purpose has for more than fifty years been treated as a permanent appropriation, but a ruling of the Secretary of the Treasury now throws these claims into a class requiring specific appropriations from Congress, which will lapse at the expiration of two years. No good reason is apparent why the goverment should seek to retain money never belonging to it, nor to embarrass its prompt return with narrow construction, nor

the necessity for special legislation in each case. The occurrence of such cases could not be anticipated by executive officers, and hence they could not be embraced in annual estimates. We have, therefore, sought to put this matter where it has stood for more than fifty years, by declaring it to be a permanent specific appropriation.

Section 269 provides equitable relief for settlers to whom the United States has sold lands at the double minimum price on the assumption of their being within the lateral limits of railroad grants. It subsequently proves that said grant is forfeited by reason of non-construction; or by change of location, or by more accurate adjustment of the withdrawal, it transpires that the lands thus sold were not within said limits, and became properly subject to sale at the single minimum price. In such cases, the United States have failed to give the settler the promised equivalent for his excess payment, and in some form he is entitled to equitable satisfaction. Various modes of adjustment have heretofore been proposed to Congress, the most favored being by way of indemnity scrip, or the right to locate, without occupation, an equivalent area of single minimum lands. The commission believe that the scrip policy is vicious both in theory and practice; and we have preferred to recommend the ordinary business mode of refunding to the settler the excess payments erroneously exacted from him. The excess money was paid by the settler under an assumed state of facts which prove not to exist. The government simply returns it to him, as having been exacted without consideration.

Section 270 is the present law.

Section 271 provides a mode for absorbing outstanding land scrip. The commission respectfully calls the attention of Congress to the dangerous and unwise practice which has heretofore prevailed of authorizing the issue of scrip locatable upon the public domain. These are usually in satisfaction of equitable land claims against the United States, which the government is unwilling or unable to satisfy in place. If the claim is just, it should be satisfied with a money equivalent; and the government should not resort to a compromise payment in land scrip, which does not do justice to the claimant, and which complicates other public land titles with the incubus of unknown and speculative floats. We are, however, confronted with the fact that, more or less of this scrip is outstanding, and has passed under the faith of existing legislation into the hands of innocent purchasers for a valuable consideration. Our recommendation is to devote the arable lands exclusively to homesteads, and abolish the pre-emption law and the cash commutation privilege. But under existing laws this outstanding scrip is mainly usable in paying for pre-emptions and commuted homesteads. To extend simple justice to its purchasers, section 271 makes it locatable within two years from passage of this act upon lands of similar class to which it was heretofore applicable.

Sections 272 and 273 are intended to meet a great defect in present legislation, and to destroy the ability of trespassers to practically suspend by their unlawful occupation the operation of the public land laws. They are in furtherance of the policy of the proposed settlement laws, which require that persons, claiming title or control of public lands, shall perfect by some prescribed act their possessory or other claims of title; and that their refusal or omission so to do shall not lock up the public domain against other lawful claimants. The decisions of the Supreme Court in Atherton *vs.* Fowler (6 Otto, 573), and in Hosmer *vs.* Wallace (7 Otto, 575), have pointed out the infirmity of the present settlement laws; and these sections are designed to provide an adequate

remedy against the continued absorption of the public lands by the mere fact of illegal occupation.

Section 274 and the first part of section 275 are re-enactments of the present law. The latter part of 275 reserves, in all lands hereafter sold or granted by the United States, an easement to the public for highways. The *method* of declaring the easement is left to local discretion and legislation; but the reservation is deemed wise, as it will tend to prevent the locking up of water fronts on inland streams, and obstruction to parties owning back lands from getting out timber. A similar reservation is found in the Canada land laws, except that it is defined by a prescribed width on the section lines. But the topographical features of the country may make a highway on any given line impracticable, and we have, therefore, simply reserved the easement and left its application to local necessity.

Section 276 is intended to bring special rights of way to railroads, and which have not as yet been utilized, within the provisions of the general act of March 3, 1875. Congress has heretofore made some special grants of this character, without requiring any definition of the right of way, either by the filing of maps with the Interior Department, or by location upon the earth's surface. In a general way, they are claimed to be easements during the life of the statute, locatable at pleasure, and to the exclusion of every one throughout the general section of country which the road pretends to occupy with its local charter. The section suggested will put these roads in the general requirement to give precision by location and to give notice to the public by the filing of their maps with the Secretary of Interior.

Section 277 provides for an exchange and consolidation, under proper conditions, of certain lands held by corporations under Congressional grants. The provision is recommended as being of great advantage in aiding irrigation projects, and in facilitating actual settlement under the homestead, colony, and other settlement laws.

All of which is respectfully submitted.

J. A. WILLIAMSON.
CLARENCE KING.
A. T. BRITTON.
THOMAS DONALDSON.
J. W. POWELL.

DEPARTMENT OF THE INTERIOR,
Washington, February 25, 1880.

SIR: I have the honor to submit herewith, for the consideration of Congress, copy of letter addressed to me, on the 21st instant, by Maj. J. W. Powell, a member of the Public Land Commission appointed under the sundry civil appropriation act of 3d March last (20 Stat., 394), in which he suggests certain amendments to the preliminary report of said commission, submitted by me to Congress this day, thereby qualifying, in some respects, his approval thereof.

C. SCHURZ,
Secretary.

The Hon. THE SPEAKER
Of the House of Representatives.

DEPARTMENT OF THE INTERIOR,
PUBLIC LAND COMMISSION,
Washington, D. C., February 21, 1880.

SIR: I desire to qualify my approval of the report of the Public Land Commission, and accompanying draft of bill, as follows:

It is recommended that section 151 of chapter IX be amended by striking out the words "by the person conducting the same" * * * "or to," and adding a new clause to the section. As thus amended it will read:

SECTION 151. The right to the use of water on any tract of irrigable land shall depend on *bona fide* prior appropriation; and such right shall not exceed the amount of water actually appropriated and necessarily used for the purpose of irrigation and reclamation; and all surplus water over and above such actual appropriation and use, together with the water of all lakes, rivers, and other sources of water supply upon the public lands and not navigable, shall remain and be held free for the appropriation and use of the public for irrigation, mining, and manufacturing purposes, subject to existing rights.

The right of way for the construction on the public lands of canals and other hydraulic works necessary for irrigation is hereby established; but whenever any person in the construction of such canals or hydraulic works injures or damages another settler on the public domain, the party committing such injury or damage shall be liable to the party injured for such injury or damage; and, in the absence of necessary legislation by Congress, the legislature of any State or Territory may enact laws and prescribe rules relating to the easements necessary for irrigation.

It is also recommended that section 193 of chapter XII be amemded by striking out the words "agricultural" * * * "or other," and inserting after the word "mining" the conjunction "or." As thus amended the section will read:

SECTION 193. Whenever, by priority of possession, rights to the use of water for mining or manufacturing purposes have vested and accrued, and the same are recognized and acknowledged by the local customs, laws, and the decisions of courts, the possessors and owners of such vested rights shall be maintained and protected in the same, and the right of way for the construction of ditches and canals for the purposes herein specified is acknowledged and confirmed; but whenever any person in the construction of any ditch or canal injures or damages the possession of any settler on the public domain the party committing such injury or damage shall be liable to the party injured for such injury or damage.

These amendments are designed to prevent the severance of water property from land property, and to provide that the right to use the water for irrigation purposes shall inhere in the land and pass with the title to the land on condition of continuous use, and to prevent a state of affairs under which all of the agriculture of the vast area where irrigation is necessary would be subject and tributary to a few stock companies owning the water.

It is further recommended that a new section be added to chapter X, following immediately upon section 154, as follows:

SECTION —. In the lands patented under the provisions of this chapter all subterranean mining property, and rights for mining purposes, are hereby severed from the surface property and rights for pasturage purposes, and whenever the surface property and rights for pasturage purposes to any tract of land have passed from the government under the provisions of this act, subterranean property and rights for mining purposes therein may be acquired under the provisions of the twelfth chapter of this act, and in absence of necessary legislation by Congress the local legislature of any State or Territory may provide rules for discovering and working such mines involving easements, drainage, and other means necessary to their complete development.

In every patent issued for pasturage land under the provisions of this chapter there shall be inserted the following clause:

Except and excluding from these presents all subterranean property rights in any mine of gold, silver, cinnabar, lead, tin, copper, coal, iron, or other valuable mineral deposit; and the property conveyed in this patent shall be servient to the easements necessary for discovering and working mines therein, and in the absence of legislation by Congress the local legislature of the State or Territory in which the above-described land is situate may provide rules for exploring and prospecting thereon, and for the working of mines therein involving easements, drainage, and other means necessary to discovery and development.

In every patent for mineral land issued under the provisions of this section there shall be inserted the following clause:

Except and excluding from these presents all surface property rights; provided that there shall be dominant in the property conveyed in this patent the easements on the surface property necessary for discovering and working mines therein, and in the absence of legislation by Congress the local legislature of the State or Territory in which the above-described land is situate may provide rules for exploring and prospecting for mines thereon, and for working of mines therein, involving easements, drainage, and other means necessary to discovery and development.

About one-half of all the lands in the western portion of the United States bearing gold, silver, and other ores of like geological occurrence, are covered with forests, and hence are both timber and mineral lands. Provision has been made in the tentative bill for the sale of the timber, the fee of the land to remain in the government, and such lands are held free to exploration and acquirement of title as mineral lands. The other one-half of these mineral lands are also pasturage lands. It is believed that the enactment of the pasturage law as recommended by the commission, without the amendment above indicated, would result in passing a large amount of mineral lands into the hands of people engaged in pasturage industries, and thus the mining industry of the country would be greatly retarded. The pasturage homestead is necessarily very large, and as it is given to the settler he should not consider it a hardship if the mines contained therein are severed from his ownership. It is believed that at least ninety-nine one-hundredths of all the coal lands of the western portion of the United States are situate in lands belonging to the class designated in the tentative bill as pasturage lands. It has been recommended that the coal lands be sold at ten dollars per acre; but in the pasturage homestead act titles can be acquired to four sections of pasturage land at a nominal price, and such lands might and would be defined properly as coal lands; that is, they would contain beds of coal of commercial value. The pasturage homestead act, without the amendment proposed, would defeat the measure designed to secure the sale of the coal lands at ten dollars per acre.

I would respectfully request that these suggestions for amendments be transmitted to Congress.

I am, with great respect, your obedient servant,

J. W. POWELL.

The Hon. the SECRETARY OF THE INTERIOR,
Washington, D. C.

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AN ACT to provide for the survey and disposal of the public lands of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, viz:

CHAPTER I.

THE GENERAL LAND OFFICE.

SECTION 1. The Secretary of the Interior shall, in his discretion, exercise supervisory powers over the administration of all laws concerning the public lands, including mines, and over the survey and patenting of private land claims.

SEC. 2. There shall be in the Department of the Interior a Commissioner of the General Land Office, who shall be appointed by the President, by and with the advice and consent of the Senate, and shall be entitled to a salary of six thousand dollars per year.

SEC. 3. The Commissioner of the General Land Office shall perform or direct subject to the supervision of the Secretary of the Interior, all executive acts appertaining to the surveying and sale of the public lands of the United States, or in anywise respecting such public lands, and also such as relate to private claims of land, and the issuing of patents for all grants of land under the authority of the Government; and in such routine duties as may be assigned to his subordinates by the Commissioner their orders shall be considered as emanating from him, and shall have full force and effect as such.

SEC. 4. All returns relative to the public lands, and all official information or reports from officers in the public land service, shall be made to the Commissioner of the General Land Office, or to such officer as he may direct, and all the duties of said officers shall be performed under his authority and direction; and he shall have power to audit and settle all public accounts relative to the public lands; and upon the settlement of any such account, he shall certify the balance, and transmit the account, with the vouchers and certificate, to the First Comptroller of the Treasury, for his examination and decision thereon.

SEC. 5. The Commissioner of the General Land Office shall, when required by the President, or either House of Congress, make a plat of any land surveyed under the authority of the United States, and give such information respecting the public lands, and concerning the business of his office as shall be directed.

SEC. 6. The Commissioner of the General Land Office shall retain the charge of the seal heretofore adopted for the office, which may continue to be used, and of the records, books, papers and other property appertaining to the office.

SEC. 7. The Commissioner of the General Land Office is authorized to decide upon principles of equity and justice, as recognized in courts of equity, and in accordance with regulations to be settled by the Secretary of the Interior, the Attorney General, and the Commissioner conjointly, consistently with such principles, all cases of suspended entries of or locations upon public lands, which have arisen in the General Land Office since the twenty-sixth day of June, 1856, as well as all cases of a similar kind which may hereafter occur, embracing as well locations

with warrants or scrip as ordinary entries or sales, and including homestead entries and pre-emption locations, and cases where the law has been substantially complied with, and the error or informality arose from ignorance, accident, or mistake, which is satisfactorily explained; and the said Commissioner shall adjudge upon which of such cases patents shall issue.

SEC. 8. Every such adjudication shall be approved by the Secretary of the Interior and the Attorney General acting as a board, and shall operate only to divest the United States of the title to lands embraced thereby, without prejudice to the rights of conflicting claimants.

SEC. 9. The Commissioner is directed to report to Congress, at the first session after any such adjudications have been made, a list of the same, under the classes prescribed by law, with a statement of the principles upon which each case was determined.

SEC. 10. The Commissioner shall arrange his decisions into two classes; the first class to embrace all such cases of equity as may be finally confirmed by the board, and the second class to embrace all such cases as the board reject and decide to be invalid.

SEC. 11. For all lands covered by claims which are placed in the first class, patents shall issue to the claimants; and all lands embraced by claims placed in the second class, shall, *ipso facto*, revert to and become part of the public domain, to be thereafter subject to disposition as other lands of similar classification.

SEC. 12. Where patents have been already issued on entries or locations, which are confirmed by the officers who are constituted the Board of Adjudication, the Commissioner of the General Land Office, upon the canceling of the outstanding patent, is authorized to issue a new patent, on such confirmation, to the person who made the entry or location, his heirs or assigns.

SEC. 13. There shall be appointed by the President, by and with the advice and consent of the Senate, an Assistant Commissioner of the General Land Office, at a salary of three thousand dollars a year, who shall be charged with such duties in the execution of the public land laws as may be prescribed by the Commissioner of the General Land Office, or by law, and who shall act as Commissioner of the General Land Office in the absence of that officer, or during any vacancy in that office.

SEC. 14. There shall be in the General Land Office an officer called the Recorder of the General Land Office, who shall be appointed by the President, by and with the advice and consent of the Senate, and shall be entitled to a salary of twenty-four hundred dollars a year; and in the absence of said Recorder, or during any temporary vacancy in said office, the duties thereof shall be performed by a chief of division in the General Land Office, to be designated by the Commissioner thereof.

SEC. 15. All patents issuing from the General Land Office shall be issued in the name of the United States, and be signed by the President and countersigned by the Recorder of the General Land Office, and shall be recorded in that office in books to be kept for the purpose.

SEC. 16. The President is authorized to designate from time to time one or more clerks of the General Land Office, whose duty it shall be, under the direction of the President, to sign in his name and for him the patents for lands sold or granted under the authority of the United States.

SEC. 17. It shall be the duty of the Recorder of the General Land Office, in pursuance of instructions from the Commissioner, to certify and affix the seal of the office to all patents for public lands, or private

land claims, and to attend to the correct engrossing, recording, and transmission of such patents. He shall prepare alphabetical indexes of the names of patentees and of persons entitled to patents, and he shall prepare and certify such copies and exemplifications of matters on file or recorded in the General Land Office as the Commissioner may from time to time direct, or as may be authorized by law.

SEC. 18. Whenever any person applies to the General Land Office for copies of records, books or papers filed and remaining therein, in anywise affecting titles or claims of title under the public land laws or treaty stipulations, it shall be the duty of the Commissioner of the General Land Office to furnish such copies, authenticated under the hand of the Recorder and the seal of the office for the person so applying, upon the payment by such person at the rate of fifteen cents per hundred words, and of two dollars for copies of township plats or diagrams, and the actual cost of the preparation of copies of plats larger than township plats, with an additional sum of one dollar for the Recorder's certificate of verification with the General Land Office seal; and one of the employees of the office shall be designated by the Commissioner as the Receiving Clerk, and the amounts so received shall, under the direction of the Commissioner, be paid into the Treasury; but fees shall not be demanded for such authenticated copies as may be required by the officers of any branch of the Government, nor for such unverified copies as the Commissioner in his discretion may deem proper to furnish. Copies of any documents, records, books or papers in the General Land Office, certified by the Recorder under the seal of the General Land Office, or, when the Recorder is absent, or his office is temporarily vacant, by the officer acting as Recorder for the time, shall be evidence equally with the originals.

SEC. 19. There shall be in the General Land Office a principal clerk of surveys, who shall have scientific and practical knowledge of surveying, and receive a salary of three thousand dollars a year. He shall assist the Commissioner of the General Land Office in the surveying duties herein devolved upon that officer, and so far as he may be thereto authorized by said Commissioner his orders and acts shall be deemed the orders of the Commissioner.

SEC. 20. That from and after

all other officers, clerks, and employees in the General Land Office shall be as follows:

A chief clerk, who shall receive a salary of two thousand five hundred dollars a year.

A solicitor, who shall receive a salary of two thousand seven hundred dollars a year.

Nine chiefs of divisions, who shall each receive a salary of two thousand four hundred dollars a year.

One chief draughtsman, who shall receive a salary of two thousand two hundred dollars a year.

Ten assistant chiefs of division, who shall each receive a salary of two thousand dollars a year.

Fifteen clerks, at eighteen hundred dollars a year each.

Thirty-five clerks, at sixteen hundred dollars a year each.

Forty clerks, at fourteen hundred dollars a year each.

Fifty clerks, at twelve hundred dollars a year each.

Ten draughtsmen, at twelve hundred dollars a year each.

Twenty clerks, at a salary of one thousand dollars a year each.

Ten copyists, at a salary each of nine hundred dollars a year.

Two packers, at a salary each of eight hundred and forty dollars a year.

A chief messenger, at a salary of eight hundred and forty dollars a year.

Nine assistant messengers, at a salary each of seven hundred and twenty dollars a year.

Twelve laborers, at a salary each of seven hundred and twenty dollars a year.

And said other officers, clerks, and employees shall be appointed by the Secretary of the Interior, upon the nomination of the Commissioner of the General Land Office.

SEC. 21. That all offices heretofore authorized in the General Land Office, but not specifically provided for by this law, shall be, and the same are hereby, abolished.

SEC. 22. The officers, clerks, and employees of the General Land Office are prohibited from directly or indirectly purchasing, or becoming interested in the purchase of, any of the public land; and any person who violates this section shall forthwith be removed from his office.

CHAPTER II.

APPEALS.

SEC. 23. The right of appeal to the Secretary of the Interior from the decisions, orders, or acts of his subordinate officers shall be exercised by claimants only in the events and upon the terms and conditions hereinafter specified.

SEC. 24. The right of appeal to the Commissioner of the General Land Office from the decisions, orders, or acts of his *subordinate officers* shall be exercised by claimants only in the events and upon the terms and conditions hereinafter specified.

SEC. 25. Any decision, order, or official act of the Commissioner of the General Land Office shall be subject to appeal to the Secretary of the Interior by any party having a *bona fide* interest in the subject-matter affected thereby: *Provided*, That notice of intention to so appeal be filed in the General Land Office at Washington within ninety days after date of such decision, order, or official act: *And provided further*, That said appeal be thereafter perfected and prosecuted according to regulations to be prescribed by the Secretary of the Interior, whose duty it is hereby made to prescribe and publish such regulations. Upon failure to file such notice of intention within said ninety days, no right of appeal shall thereafter exist; and in the event of such seasonable filing, upon failure to perfect and prosecute said appeal according to the regulations previously prescribed and published by the Secretary of the Interior, said appeal shall be dismissed.

SEC. 26. The Commissioner of the General Land Office shall each week print copies of such laws, decisions, regulations, and circulars as may be necessary for the information of the public; and he shall transmit copies of the same each week to the several district land officers and the surveyors general, who shall be required to post the same conspicuously in their several offices for the convenient use and examination of the public. Said publication is hereby declared to be competent evidence of the several decisions, regulations, and circulars in all the courts and public offices of the United States without further proof

or authentication thereof; and copies thereof shall be furnished by the Commissioner to any person applying therefor upon payment of the costs with twenty-five per centum added.

SEC. 27. Any decision, order, or official act of any officer subordinate to the Commissioner of the General Land Office shall be subject to appeal to the said Commissioner by any party having a *bona fide* interest in the subject-matter affected thereby: *Provided*, That notice of intention to so appeal be filed with the said subordinate officer within thirty days after notice of such decision, order, or official act: *And provided further*, That said appeal be thereafter perfected and prosecuted according to regulations to be prescribed by the Commissioner of the General Land Office, whose duty it is hereby made to prescribe and publish such regulations. Upon failure to file such notice of intention within said thirty days after notice, no right of appeal shall thereafter exist; and upon failure, after such seasonable filing, to comply with the regulations previously prescribed and published by the Secretary of the Interior, the appeal shall be dismissed.

SEC. 28. When a party entitled to take an appeal, as hereinbefore provided, is an infant, insane person, or imprisoned, such appeal may be taken within the time heretofore prescribed, exclusive of the term of such disability.

CHAPTER III.

SURVEYS AND SURVEYORS.

SEC. 29. The Commissioner of the General Land Office shall direct and superintend the making of all surveys connected with the public land system and all matters relating thereto.

He is hereby authorized to prescribe the use, by Surveyors General and their deputies, of such instruments as he may deem best to secure economy and accuracy in the execution of the surveys, and to adopt such methods of monumentation and marking of lines on the ground as he may deem best to secure the permanency of such monuments and marks and their most ready and certain identification.

He shall cause the surveys to be made in such manner as to determine under what class the several tracts surveyed shall be placed, and the plats to be so constructed, and the field notes to be so prepared, as to exhibit the character of the lands and the facts necessary for their proper classification.

SEC. 30. It shall be the duty of the Commissioner of the General Land Office to prepare manuals of instruction for the survey of public lands, private land claims, and mineral locations, and he shall have authority to revise the same from time to time as the service may require.

SEC. 31. It shall be the duty of the Commissioner of the General Land Office to cause to be prepared annually, and to keep on file, a map of surveys for each land district, exhibiting the extent of the surveys in such district at the close of each year; and he shall furnish to the Register of each land district, annually, a copy of the map of surveys of his district; and he shall furnish to each surveyor general, annually, copies of the maps of all the land districts in the Surveyor General's surveying district. All copies of the original maps of surveys shall be made by automatic methods under the direction of the Commissioner of the General Land Office, and shall be furnished to any person applying for the same

at the cost of paper and printing with twenty-five per centum added thereto; and all moneys received for such copies of maps shall be covered into the Treasury of the United States.

SEC. 32. The States of California, Colorado, Florida, Louisiana, Minnesota, Nevada, Nebraska and Oregon, and the Territories of Dakota, Idaho, Montana, Washington, Wyoming, Utah, Arizona and New Mexico shall respectively be surveying districts, and the President shall, by and with the advice and consent of the Senate, appoint one Surveyor General for each of said districts.

SEC. 33. The salary of each Surveyor General shall be three thousand dollars per year, and every Surveyor General hereafter appointed shall be a man having scientific and practical knowledge of surveying.

SEC. 34. There shall be but one office of Surveyor General in each Surveyor General's district; and such office shall be located as the President, in view of the public convenience, may from time to time direct.

SEC. 35. Every Surveyor General, while in the discharge of the duties of his office, shall reside in the district for which he is appointed.

SEC. 36. The Commissioner of the General Land Office shall take all the necessary measures for the completion of the surveys in the several surveying districts for which Surveyors-General have been, or may be, appointed, at the earliest periods compatible with the purposes contemplated by law; and whenever the surveys and records of any such district are completed, the Surveyor-General thereof shall be required to deliver over to the Secretary of State of the State or Territory including such surveys, or to such other officer as may be authorized to receive them, all the field-notes, maps, records, and other papers appertaining to land titles within the same; and the office of Surveyor-General in every such district shall thereafter cease and be discontinued: *Provided*, They shall in no case be turned over to the authorities of any State or Territory until such State or Territory has provided by law for the reception and safe-keeping of the same as public records, and for the allowance of free access to the same by the authorities of the United States.

SEC. 37. In all cases where, as provided in the preceding section, the field-notes, maps, records, and other papers appertaining to land titles in any State or Territory, are turned over to the authorities of such State or Territory, the same authority, powers, and duties in relation to the survey, resurvey, or subdivision of the lands therein, and all matters and things connected therewith, as previously exercised by the Surveyor-General whose district included such State or Territory, shall be vested in and devolved upon the Commissioner of the General Land Office.

SEC. 38. Under the authority and direction of the Commissioner of the General Land Office, any deputy surveyor or other agent of the United States shall have free access to any such field-notes, maps, records, and other papers, for the purpose of taking extracts therefrom, or making copies thereof, without charge of any kind.

SEC. 39. Every Surveyor-General shall engage a sufficient number of skillful surveyors as his deputies, to whom he is authorized to administer the necessary oaths upon their appointments, and who shall under his direction survey the public lands and private land claims. He shall have authority to frame regulations for their direction, not inconsistent with law or the instructions of the General Land Office, and to remove them for negligence or misconduct in office.

Second. He shall cause to be surveyed, measured, and marked, without delay, all base and meridian lines through such points and perpet-

uated by such monuments, and such other correction parallels and meridians and other lines as may be prescribed by law or by instructions from the Commissioner of the General Land Office, in respect to the public lands within his surveying district, to which the Indian title has been or may be hereafter extinguished.

Third. He shall cause to be surveyed all private land claims within his district so far as may be necessary to complete the survey of the public lands.

Fourth. He shall transmit to the registers of the respective land-offices within his district general and particular plats of all lands surveyed by him for each land district; and he shall forward copies of such plats to the Commissioner of the General Land Office.

Fifth. He shall, so far as is compatible with the desk duties of his office, occasionally inspect the surveying operations while in progress in the field, sufficiently to satisfy himself of the fidelity of the execution of the work according to law and instructions; and the actual and necessary expenses incurred by him, while so engaged, shall be allowed; but when a Surveyor-General is engaged in such special service he shall receive only his necessary expenses in addition to his regular salary. The Commissioner of the General Land Office is also authorized to send out special inspectors to examine the character of the work being performed in the field; and the salaries and expenses of such officers shall be paid from the regular appropriation for public surveys.

Sixth. He shall in the taking of testimony authorized by law, or under the direction of the Commissioner of the General Land Office, exercise the powers and duties as to issuing subpœnas or perpetuating testimony as are granted to Registers in sections 68, 69, and 70 of this act.

SEC. 40. The official seals heretofore authorized to be provided for the offices of the Surveyors General of Oregon, California, and Louisiana shall continue to be used; and official seals shall in like manner be furnished for the offices of all Surveyors-General, and any copy of or extract from the plats, field-notes, records, or other papers on file in those offices, respectively, when authenticated by the seal and signature of the proper Surveyor-General, shall be evidence in all cases in which the original would be evidence.

SEC. 41. Any copy of a plat of survey, or transcript from the records of the office of any Surveyor-General duly certified by him, shall be admitted as evidence in all the courts of the United States and of the Territories thereof.

SEC. 42. An accurate account shall be kept by each Surveyor-General of the cost of surveying and platting private land claims, to be reported to the General Land Office, with the map of such claim; and patents shall not issue for any such private claim until the cost of survey and platting has been paid into the Treasury by the claimant.

SEC. 43. When any person or persons who may be entitled to acquire lands under any law of the United States desires a survey of unsurveyed public lands not reserved by proper authority or otherwise appropriated, such person or persons may file an application therefor in writing with the proper Surveyor-General, who may, under such instructions as may be given him by the Commissioner of the General Land Office, and in accordance with law, survey such lands and make return thereof, as of other surveys of public lands, to the General and proper local land offices: *Provided, however*, That such persons shall deposit in a proper United States depositary, to the credit of the United States, a sum sufficient to pay for such survey, together with all the expenses incident thereto.

SEC. 44. The deposit of money in a proper United States depositary, under the provisions of the preceding section, shall be deemed an appropriation of the sum so deposited for the objects contemplated by that section; and the Secretary of the Treasury is authorized to cause the sums so deposited to be placed to the credit of the appropriations for the surveying service; but any excesses in such sums over and above the actual cost of the surveys, comprising all expenses incident thereto, for which they were severally deposited, shall be repaid to the depositors respectively.

SEC. 45. Where persons make deposits in accordance with the provisions of section forty-three, the amount so deposited may be used in payment for their lands situated in the township, the surveying of which is paid for out of such deposits; or the certificates issued for such deposits may be assigned by indorsement and be received in payment for any public lands of the United States which the assignee may be entitled to enter under the law. *Provided*, That when such certificates of deposit are in excess of the price of the land so entered the Commissioner of the General Land Office shall give to the purchasers excess certificates, which may be located on the same terms as the original certificates of deposit.

SEC. 46. There shall be allowed for the offices of the several Surveyors-General, for the employment of deputy surveyors, for monuments to mark surveys, for instruments, clerk-hire, office rent, fuel, books, stationery, and for other incidental expenses, such sums as may be appropriated for the purpose, by Congress, from year to year.

SEC. 47. Every deputy surveyor shall, before entering on the duties of his office, execute and deliver to the Secretary of the Interior, a bond with good and sufficient security for the penal sum of five thousand dollars, conditioned for the faithful disbursement, according to law, of all public money placed in his hands, and for the faithful performance of the duties of his office.

SEC. 48. The Surveyors-General, in addition to the oath now authorized by law to be administered to deputies on their appointment to office, shall require each deputy, on the return of his surveys, to take and subscribe an oath that those surveys have been faithfully and correctly executed according to law and the instructions of the Surveyor General.

SEC. 49. The deputy surveyors may each be allowed as compensation for their services, when employed either by the day, month, or year, such salary, not exceeding the rate of three thousand dollars per annum, as may be fixed by the Commissioner of the General Land Office and approved by the Secretary of the Interior.

SEC. 50. Whenever any portion of the public surveys are so required to be made as to render it expedient to let a contract for the survey thereof instead of having it done by salaried deputies, it shall be lawful for the Commissioner of the General Land Office to make such fair and reasonable contract as in his judgment may be necessary to insure the accurate and faithful execution of the work.

SEC. 51. The lines bounding townships on the east and west sides shall, in all cases, be true meridians, and those on the north and south sides shall be chords intersecting circles of latitude passing through the angles of the townships, so as to form townships six miles square as nearly as the convergence or divergence of meridians will permit; except where the line of an Indian reservation, or of tracts of land heretofore surveyed or patented, or the course of navigable rivers, may render this impracticable; and in that case this rule must be departed from no further than such particular circumstances require.

Second. The meridian passing north and south from the initial point of a system of townships shall be designated as the principal meridian, and the parallel passing east and west from the said initial point shall be designated as the principal base line. A tier of townships successively contiguous from north to south shall be designated as a range. Ranges shall be numbered east and west respectively from the principal meridian, and townships shall be numbered in the range north and south respectively from the principal base line.

Third. The corners of the townships must be marked with progressive numbers from the beginning; each distance of a mile between such corners must be also distinctly marked with marks different from those of the corners.

Fourth. The township shall be subdivided into sections, containing, as nearly as may be, six hundred and forty acres each, by running through the same, each way, parallel lines at the end of every mile; and by marking a corner on each of such lines, at the end of every mile. The sections shall be numbered respectively, beginning with the number one in the northeast section and proceeding west and east alternately through the townships with progressive numbers till the thirty-six be completed.

Fifth. Where the exterior lines of the townships which may be subdivided into sections, half sections, or other smaller subdivisions exceed, or do not extend, six miles, the excess or deficiency shall be specially noted, and added to or deducted from the western and northern ranges of sections, half sections, or other smaller subdivisions in such township, according as the error may be in running the lines from east to west, or from south to north; the sections, half sections, or other smaller subdivisions, bounded on the northern and western lines of such townships, shall be sold as containing only the quantity expressed in the returns and plats respectively, and all others as containing the complete legal quantity.

Sixth. The field-books shall be returned to the Surveyor-General, who shall cause therefrom a description of the whole lands surveyed to be made out and transmitted to the officers who may superintend the sales or disposal. He shall also cause a fair plat to be made of the townships and fractional parts of townships contained in such lands, describing the sub-divisions thereof, and the marks of the corners: This plat shall be recorded in books to be kept for that purpose; and a copy thereof shall be kept open at the Surveyor-General's office for public information, and other copies shall be sent to the places of the sale, or disposal, and to the General Land Office.

SEC. 52. The boundaries and contents of the several sections, half sections, and quarter sections of the public lands shall be ascertained in conformity with the following principles:

First. All the corners marked in the surveys, returned by the Surveyor-General shall be established as the proper corners of sections, or subdivisions of sections, which they were intended to designate; and the corners of half and quarter sections, not marked on the surveys, shall be placed as nearly as possible equidistant from two corners which stand on the same line.

Second. The boundary lines actually run and marked in the surveys returned by the Surveyor-General shall be established as the proper boundary lines of the sections, or subdivisions, for which they were intended, and the length of such lines, as returned, shall be held and considered as the true length thereof. And the boundary lines which have not been actually run and marked shall be ascertained by running straight lines from the established corners to the opposite corresponding corners;

but in those portions of the fractional townships where no such opposite corresponding corners have been or can be fixed, the boundary lines shall be ascertained by running from the established corners due north and south or east and west lines, as the case may be, to the water-course, Indian boundary line, or either external boundary of such fractiona township.

Third. Each section, or subdivision of a section, the contents whereof have been returned by the Surveyor-General, shall be held and considered as containing the exact quantity expressed in such return; and the half sections and quarter sections, the contents whereof shall not have been thus returned, shall be held and considered as containing the one-half or the one-fourth part, respectively, of the returned contents of the section of which they may make part.

SEC. 53. In every case of the division of a quarter section, the line for the division thereof shall run north and south, and the corners and contents of half quarter sections, which may thereafter be sold, shall be ascertained in the manner and on the principles directed and prescribed by the section preceding; and fractional sections containing one hundred and sixty acres and upwards shall, in like manner, as nearly as practicable, be subdivided into half quarter sections, under such rules and regulations as may be prescribed by the Commissioner of the General Land Office, and in every case of a division of a half quarter section, the line for the division thereof shall run east and west; and the corners and contents of quarter quarter sections, which may thereafter be sold, shall be ascertained, as nearly as may be, in the manner and on the principles directed and prescribed by the section preceding; and fractional sections containing fewer or more than one hundred and sixty acres shall, in like manner, as nearly as may be practicable, be subdivided into quarter quarter sections, under such rules and regulations as may be prescribed by the Commissioner of the General Land Office.

SEC. 54. Whenever, in the opinion of the Commissioner of the General Land Office, a departure from the ordinary method of surveying land on any river, lake, bayou, or water-course would promote the public interest, he may direct the Surveyor-General in whose district such land is situated, and where the change is intended to be made, to cause the lands thus situated to be surveyed in tracts of two acres in width, fronting on any river, bayou, lake, or water-course, and running back to the depth of forty acres; which tracts of land so surveyed shall be offered for sale entire instead of in half quarter sections, and in the usual manner and on the same terms in all respects as the other public lands of the United States.

SEC. 55. Whenever, in the opinion of the Commissioner of the General Land Office, a departure from the rectangular mode of surveying and subdividing the public lands would promote the public interests, he may direct such change to be made in the mode of surveying and designating such lands as he deems proper, with reference to the existence of mountains, mineral deposits, and the advantages to be derived from timber and water privileges; but such lands shall not be surveyed into less than one hundred and sixty acres, nor subdivided into less than forty acres.

SEC. 56. Every person who in any manner, by threats or force, interrupts, hinders, or prevents the surveying of the public lands, or of any private land claim which has been or may be confirmed by the United States, by the persons authorized to survey the same in conformity with law, shall be fined not less than fifty dollars nor more than three thousand dollars, and be imprisoned not less than one nor more than three years.

SEC. 57. Whenever the President is satisfied that forcible opposition has been offered, or is likely to be offered, to any surveyor or deputy surveyor in the discharge of his duties in surveying the public lands, it may be lawful for him to order the marshal of the State or district, by himself or deputy, to attend such surveyor or deputy surveyor with sufficient force to protect such officer in the execution of his duty, and to remove force should any be offered.

SEC. 58. The public surveys shall extend over all mineral lands; and all subdividing of surveyed lands into lots less than one hundred and sixty acres may be done by county and local surveyors at the expense of claimants.

SEC. 59. Whenever monuments of surveys upon public lands are obliterated, upon due proof of that fact to the Surveyor General, the settlers upon the land may have the monuments re-established under the provisions contained in sections 43, 44, and 45 of this act.

SEC. 60. All State and Territorial boundary lines hereafter to be surveyed, and corrections of those heretofore surveyed, shall be surveyed under the direction of the Superintendent of the Coast and Geodetic Survey. And the said Superintendent shall also cause the meridians and base lines and township corners of the public land surveys to be tied into his coast and geodetic surveys as the same are extended over surveyed public lands; and he shall furnish, upon the application of the Commissioner of the General Land Office, the true location of such lines and corners, so as to give the requisite information for their restoration if destroyed or removed.

SEC. 61. That if any person or persons shall knowingly or wilfully remove, obliterate, or destroy any stake, stone, or other object placed or marked as a monument to indicate a corner of the surveys made by or under the authority of the United States, such person or persons shall, on conviction thereof, be punished by a fine not exceeding one thousand dollars, and shall moreover be liable to imprisonment not exceeding one year, or both, at the discretion of the court; and the place occupied by any such monument shall be forever reserved for the purpose of perpetuating such monument.

SEC. 62. Lands classified in this act as pasturage and irrigable may be surveyed into townships, omitting the subdivisional lines, and may be described and patented as such, and this provision may be applied to lands notoriously swamp and overflowed.

CHAPTER IV.

LAND OFFICES.

Registers.

SEC. 63. There shall be appointed by the President, by and with the advice and consent of the Senate, one officer for each land district established by law, who shall be styled Register of the Land Office.

SEC. 64. Every such Register shall reside at the place where the land office in the district for which he is appointed is directed by law to be kept, and shall have a seal, to be provided by the Commissioner of the General Land Office.

SEC. 65. Every such Register shall be allowed an annual salary of three thousand dollars; and it shall be unlawful for such officer to re-

ceive for his own use or benefit, directly or indirectly, any other compensation, whether by way of fees, rewards or otherwise; and on satisfactory proof that such officer has charged or received fees or other rewards not authorized by law, he shall be forthwith removed from office.

SEC. 66. The compensation of such Registers shall commence from the time they respectively enter upon the discharge of their duties, and they shall be removable at pleasure.

SEC. 67. Said Registers shall perform all the duties connected with the sale of the public lands heretofore enjoined by law upon Registers of land offices; and shall, before entering upon the duties of their offices, give bonds each in the penal sum of ten thousand dollars, with approved security, for the faithful discharge of their trusts; and in addition thereto they shall also perform all the duties, and under similar conditions and bonds, which have heretofore been imposed upon or required by law from Receivers of public moneys; and the separate office of Receiver of public moneys is hereby abolished.

SEC. 68. Each Register of the land office is authorized, and it shall be his duty, to administer any oath required by law, or the instructions of the General Land Office, in connection with the entry or purchase of any tract of the public lands; but he shall not charge or receive, directly or indirectly, any compensation for administering such oath. The findings of the Register upon a question of fact shall in the absence of appeal be final.

SEC. 69. Each register of the land office shall have power to issue subpœnas, to require before him the attendance of witnesses upon any proceeding authorized by law, or the instructions of the General Land Office, in connection with the disposal of public lands; but he shall not have power to commit for contempt. Said subpœna shall run throughout the land district for which the officer issuing the same is the Register, and it may be served by any disinterested party duly authorized by the Register to make such service. Conclusive proof of service shall be by the affidavit of the party so authorized to serve and actually making such service. Witnesses subpœnaed pursuant to this section shall be allowed the same compensation as is allowed witnesses in the courts of the United States, to be paid in advance by the party applying for the subpœna.

SEC. 70. Whenever any person so subpœnaed before such Register of the Land Office fails to appear in obedience thereto, or whenever any person examined before said officer refuses or declines to answer, or to swear, or to sign his examination when taken, or to be otherwise guilty of contempt, the Register of the Land Office shall forthwith transmit his certificate of contumacy, setting forth all the facts, and submitting the original subpœna and proof of service thereof to the judge of the nearest United States court, who shall have power to order the person so acting to pay the costs thereby occasioned and to punish him for contempt in like manner as if such subpœna had issued originally from said court, if such person be compellable by law to appear and answer such questions or to sign such examination; or such Register of the Land Office may in like manner certify the matter to the nearest State or Territorial court upon which the legislature of said State or Territory may have conferred appropriate jurisdiction in such cases.

SEC. 71. If any person applies to any Register of the Land Office to enter any land whatever, and the said officer knowingly and falsely informs the person so applying that the same has already been entered, and refuses to permit the person so applying to enter the same, such

officer shall be liable therefor to the person so applying for five dollars for each acre of land which the person so applying offered to enter, to be recovered by action of debt, in any court of record having jurisdiction of the amount.

SEC. 72. All fees now by law exacted at the district land office in connection with the disposition of the public lands, shall be, and the same are hereby, abolished.

SEC. 73. Each Register of the Land Office shall charge and receive for making transcripts for individuals or furnishing any other record information respecting public lands or land titles in his land district such fees as are properly authorized by the tariff existing in the local courts of his district; and all moneys received from such fees shall be accounted for as other public moneys; and the deposit thereof in a proper depositary of the United States shall be deemed an addition to the appropriation for incidental expenses of district land offices.

SEC. 74. The Commissioner of the General Land Office is authorized to make a reasonable allowance to each district land office for office rent, clerical services, and other necessary expenses, including the cost of depositing public moneys; said allowance to be paid out of the appropriation for incidental expenses for district land offices; but no such allowance shall be operative unless first sanctioned by the Commissioner of the General Land Office.

SEC. 75. All proofs, affidavits, or oaths authorized by law or the regulations of the General Land Office, in connection with the disposition of the public lands, may be sworn to either before the Register of the Land Office or before the judge or clerk of any court of record, or before any officer authorized to administer oaths whose official capacity shall be properly verified; and such proofs, affidavits, or oaths, when so made before any such judge, clerk, or other officer, and duly subscribed, shall have the same force and effect as if made before the district land officer, and the same shall be transmitted by such judge or clerk to the proper district land office: *Provided, however*, That in contested cases proofs may be taken by deposition, with notice to the opposite party and opportunity for cross-examination, under regulations to be prescribed by the Commissioner of the General Land Office. If any witness making such proofs, affidavits, oaths or depositions, before such Register, judge, clerk, or other officer, swears falsely to any material matter contained therein, the said false swearing being willful and corrupt, he shall be deemed guilty of perjury, and shall be liable to the same pains and penalties as are prescribed by section 5392 of the Revised Statutes of the United States.

SEC. 76. Where a plat of the survey of any township or fractional township of public lands shall have been filed pursuant to law in any district land office, the Register shall forthwith cause a notice of such filing to be published for thirty days in a newspaper published in the place nearest to such township; and the lands embraced in such township shall not be subject to application, entry, or location until the expiration of such publication.

SEC. 77. Every person making application at any of the land offices of the United States, for the purchase at private sale of a tract of land, shall produce to the Register a memorandum in writing, describing the tract, which he shall enter by the proper number of the section, half section, quarter section, half-quarter section, quarter-quarter section, fraction, or lot, as the case may be, and of the township and range, subscribing his name thereto, which memorandum the Register shall file and preserve in his office.

SEC. 78. Where two or more persons apply for the purchase, at private sale, of the same tract, at the same time, the Register shall determine the preference by forthwith offering the tract to the highest bidder: *Provided*, That the same shall not be sold for less than the price fixed by law for lands in the same classification.

SEC. 79. Where two or more persons have become purchasers of a section, or fractional section, the Register of the Land Office of the district in which the lands lie shall, on application of the parties and a surrender of the original certificate, issue separate certificates, of the same date with the original, to each of the purchasers, or their assignees, in conformity with the division agreed on by them; but in no case shall the portions so purchased be divided by other than north or south and east or west lines, nor shall any certificate issue for less than eighty acres.

SEC. 80. Whenever the quantity of public land remaining unsold in any land district is reduced to a number of acres less than one hundred thousand, it shall be the duty of the Commissioner of the General Land Office to discontinue the land office of such district; and if any land in any such district remains unsold at the time of the discontinuance of a land office, the same shall be subject to sale at some one of the existing land offices most convenient to the district in which the land office has been discontinued, of which the Commissioner of the General Land Office shall give notice.

SEC. 81. The Secretary of the Interior may continue any land district in which is situated the seat of government of any one of the States, and may continue the land office in such district, notwithstanding the quantity of land unsold in such district may not amount to one hundred thousand acres, when, in his opinion, such continuance is required by public convenience, or in order to close the land system in such State.

SEC. 82. Whenever the cost of collecting the revenue from the sales of the public lands in any land district is as much as one-third of the whole amount of revenue collected in such district, it may be lawful for the President, if, in his opinion, not incompatible with the public interests, to discontinue the land office in such district, and to annex the same to some other adjoining land district; but when the cost of collection in any land district exceeds the amount of revenue collected, such land district shall be discontinued and be annexed to some other adjoining land district.

SEC. 83. The President is authorized to change the location of the land offices in the several districts established by law, and to relocate the same from time to time at such point in the district as he deems expedient.

SEC. 84. Upon the recommendation of the Commissioner of the General Land Office, approved by the Secretary of the Interior, the President may order the discontinuance of any land office and the transfer of any of its business and archives to any other land office within the same State or Territory.

SEC. 85. The President is authorized to change and re-establish the boundaries of land districts whenever, in his opinion, the public interests will be subserved thereby, without authority to increase the number of land offices or land districts.

SEC. 86. In case of the division of existing land districts by the creation of new ones, or by a change of boundaries by the President, all business in such original districts shall be entertained and transacted without prejudice or change, until the offices in the new districts are duly

opened by public announcement under the direction of the Secretary of the Interior. All sales or disposals of the public lands regularly made at any land office, after such lands have been made part of another district by any act of Congress, or by any act of the President, are confirmed, provided the same are free from conflict with prior valid rights.

SEC. 87. Until changed as hereinbefore provided, the number and boundaries of the several land districts, and the location of the respective land offices, shall continue as now established.

CHAPTER V.

CLASSIFICATION OF LANDS.

SEC. 88. For all purposes of surveying and sale the public lands of the United States shall be classified as arable, irrigable, pasturage, timber, and mineral; and said lands, thus classified, shall be disposed of only under laws specifically applicable thereto.

SEC. 89. All non-mineral lands which will produce agricultural crops without irrigation, and which are not chiefly valuable for timber for commercial purposes, shall be classified as arable lands; and such lands shall be subject to entry and disposal only under the town-site, timber-culture, and homestead laws, except in the States of Arkansas, Louisiana, Mississippi, Alabama, and Florida.

SEC. 90. All lands, excepting mineral lands, and excepting lands chiefly valuable for timber of commercial value, which will not, without irrigation, produce some agricultural crop, except grass, for the reclamation of which sufficient water can be obtained, shall be classified as irrigable lands.

SEC. 91. All lands, excepting mineral lands, and excepting lands chiefly valuable for timber of commercial value, which will not produce crops without irrigation, and which are chiefly valuable for pasturage purposes, shall be classified as pasturage lands.

SEC. 92. All lands, excepting mineral, which are chiefly valuable for timber of commercial value, for sawed or hewed timber, shall be classified as timber lands.

SEC. 93. All lands which contain veins or lodes of quartz or other rock in place bearing gold, silver, cinnabar, lead, tin, copper, coal, iron, or other valuable deposit (and which are rendered thereby more valuable for mineral than for agricultural purposes), shall be classified as mineral lands; and the same shall be subject to entry and sale only under the provisions of the mineral laws.

SEC. 94. In ascertaining the character of lands according to the classification hereinbefore prescribed, the plats and field-notes of the official surveys shall operate as *prima facie* evidence of such character; but such showing shall be subject to correction upon proof of error satisfactory to the Commissioner of the General Land Office, and according to regulations to be prescribed by him: *Provided, however*, That if unsurveyed lands are settled upon, or sought to be entered under authority of law, or if lands heretofore surveyed have not been classified according to the provisions of this chapter, the Commissioner of the General Land Office shall prescribe the mode and character of proof to establish to his satisfaction the character of such lands: *And provided further*, That the issue of a patent by the United States shall, in the absence of fraud, be conclusive as to the character of the land covered thereby.

CHAPTER VI.

HOMESTEAD ENTRIES.

SEC. 95. All the public lands of the United States, excepting as hereinafter provided, shall be subject to homestead entry under the conditions, restrictions and stipulations provided by law.

SEC. 96. The following classes of lands, unless otherwise specially provided for by law, shall not be subject to homestead entry; to wit:

1st. Lands to which the Indian title has not been extinguished.

2d. Lands included in any reservation by any treaty, law or proclamation of the President, for any purpose.

3d. Lands included within the limits of any in corporated town: *Provided*, That if said incorporation exceeds the maximum area which may be entered as a town site under existing laws, the restriction upon the right to homestead shall apply only to so much of said excess as shall be actually settled upon, inhabited, improved, and used for business and municipal improvements.

4th. Lands actually settled and occupied for purposes of trade and business, and not for agriculture.

5th. Lands classified as mineral or timber.

SEC. 97. Every person, male or female, who is the head of a family, or who has arrived at the age of twenty-one years and is a citizen of the United States, or who has filed his or her declaration of intention to become such, as required by the naturalization laws, shall be entitled to enter one quarter section, or a less quantity of unappropriated public lands subject to homestead, to be located in a body, in conformity to the legal subdivisions of the public lands; and every person owning or residing on land may, under the provisions of this section, enter other lands lying contiguous to his or her land, which shall not, with the land so already owned and occupied, exceed in the aggregate one hundred and sixty acres.

SEC. 98. The person applying for the benefit of the preceding section shall file his or her application in writing with the Register of the proper land office, together with his or her affidavit that he or she is the head of a family, or is twenty-one years or more of age, or has performed service in the Army or Navy of the United States, and that such application is made for his or her exclusive use and benefit, and that the entry is made for the purpose of actual settlement and cultivation, and not, either directly or indirectly, for the use or benefit of any other person; and upon filing such affidavit with the Register he or she shall thereupon be permitted to enter the amount of land specified, upon the payment of eighteen dollars to the United States.

SEC. 99. No certificate, however, shall be given, or patent therefor, until the expiration of three years from the date of such application; and if at the expiration of such time, or at any other time within two years thereafter, the person making such entry; or if he be dead, his widow; or in case of her death, his heirs or devisee; or in case of a widow, or a single woman making such entry, her heirs or devisee, in case of her death, proves by two credible witnesses that he, she, or they have resided upon or cultivated the same for the term of three years immediately succeeding the time of filing the affidavit, and makes affidavit that no part of such land has been alienated, except for church, cemetery, or school purposes, or for the right of way of railroads or highways across such homestead, and that he, she, or they will bear true allegiance to the Government of the United States; then in such case he,

she, or they, if at that time citizens of the United States, shall be entitled to a patent, as in other cases provided by law.

SEC. 100. In case of marriage by a woman who may have initiated title under this act, and who was at the time of said marriage *bona fide* prosecuting the same, she shall be permitted to consummate her title in her own right upon performance of the acts and for the term required by this chapter.

SEC. 101. In case of the death of both father and mother, leaving an infant child or children under twenty-one years of age, the right and fee shall inure to the benefit of such infant child or children; and the executor, administrator, or guardian may, at any time within two years after the death of the surviving parent, and in accordance with the laws of the State in which such children, for the time being, have their domicile, sell the land for the benefit of such infants, but for no other purpose; and the purchaser shall acquire the absolute title by the purchase, and be entitled to a patent from the United States.

SEC. 102. In case of any person desirous of availing himself of the benefits of this chapter, but who, by reason of actual service in the military or naval service of the United States, is unable to do the personal preliminary acts at the district land office which the preceding sections require, and whose family, or some member thereof, or some duly authorized representative, is residing on the land which he desires to enter, and upon which a *bona-fide* improvement and settlement have been made, such person may make the affidavit required by law before the officer commanding in the branch of the service in which the party is engaged, which affidavit shall be as binding in law, and with like penalties, as if taken before the Register; and upon such affidavit being filed with the Register by the wife or other representative of the party, the same shall become effective from the date of such filing.

SEC. 103. The Register of the Land Office shall note all applications under the provisions of this chapter on the tract-books and plats of his office, and keep a register of all such entries, and make return thereof to the General Land Office, together with the proof upon which they have been founded.

SEC. 104. No lands acquired under the provisions of this chapter shall in any event become liable to the satisfaction of any debt contracted prior to the issuing of the patent therefor.

SEC. 105. If at any time after the inception of any homestead claim and prior to issue of patent thereon, it is proved, after due notice to the settler, to the satisfaction of the Register of the proper land office that the said homestead applicant has actually changed his residence or abandoned the land for more than six consecutive months, or that the said claim for any cause was originally illegal or invalid, then and in that event the land embraced in said homestead claim shall revert to the government, and any intervening claim or right to the same tract shall be deemed to have taken effect, as if the canceled homestead claim had never been made. In the event that no appeal shall be filed from the decision of the Register against such homstead claimant, said Register shall forthwith cancel said claim from his records, and shall receive any other claims to the same tracts in the order in which they may have been, or shall thereafter be, presented.

SEC. 106. No person shall be permitted to acquire title to more than one quarter-section under the provisions of this chapter, but no person shall be deemed to have had the benefit of this act except upon issue of patent.

SEC. 107. No person who has served, or may hereafter serve, for a

period not less than fourteen days in the Army or Navy of the United States, either regular or volunteer, under the laws thereof, during the existence of an actual war, domestic or foreign, shall be deprived of the benefits of this chapter on account of not having attained the age of twenty-one years.

SEC. 108. When a settlement, with a view to a homestead, has been or shall be made upon unsurveyed public lands of the United States, but otherwise subject to homestead, the right of such homestead claimant shall relate back to the date of his said settlement, but upon the express condition that the application and affidavit heretofore required shall be filed within sixty days after the date upon which such lands, after survey, shall become subject to such filing: *Provided*, That the period of his continuous residence upon unsurveyed land shall be deducted from the three years hereinbefore required after the filing of his application. Upon failure to so file within said sixty days, the right of said claimant shall take effect only from the filing of his application, as in all other cases upon surveyed lands.

SEC. 109. When settlements have been made upon unsurveyed lands, as provided for in the preceding section, and it shall prove, after survey, that two or more settlers have improvements or cultivation upon the same legal subdivision, it shall be lawful for such settlers to file a joint application for their lands at the local land office, or for either of said settlers to enter into contract with his co-settlers to convey to them their portion of said lands after a patent is issued to him, and after making said contract to file application in his own name, and proof of joint occupation by himself and others, and of such contract with them made, shall be equivalent to proof of sole occupation by himself: *Provided*, That in no case shall the amount patented under this section exceed one hundred and sixty acres.

SEC. 110. Where settlements, with a view to homestead, and followed up after survey with seasonable filing of application, have been made before the survey of the lands in the field, and are found to have been made on sections sixteen and thirty-six, those sections shall be subject to the homestead application of such settler; and if they or either of them have been or shall be reserved or pledged for the use of schools or colleges in the State or Territory in which the lands lie, other lands of like quantity are appropriated in lieu thereof; and other lands are also appropriated to compensate deficiencies for school purposes where sections sixteen and thirty-six are fractional in quantity, or where one or both are wanting by reason of the township being fractional, or from any natural cause whatever.

SEC. 111. No distinction shall be made in the construction or execution of this chapter on account of race or color.

SEC. 112. Every private soldier and officer who has served in the Army of the United States during the recent rebellion, for ninety days, and who was honorably discharged and has remained loyal to the government, including the troops mustered into the service of the United States by virtue of the third section of an act approved February 13, eighteen hundred and sixty-two, and every seaman, marine, and officer who has served in the Navy of the United States, or in the Marine Corps, during the rebellion, for ninety days, and who was honorably discharged and has remained loyal to the government, shall, on compliance with the provisions of this chapter, as hereinafter modified, be entitled to enter upon and receive a patent for a quantity of public land not exceeding one hundred and sixty acres, or one quarter section, to be taken in compact form, according to legal sub-divisions including the

alternate reserved sections of public land along the line of any railroad or other public work, not otherwise reserved or appropriated, and other lands subject to entry under the homestead laws of the United States; but such homestead settler shall be allowed six months after filing his application within which to make his entry and commence his settlement and improvement.

SEC. 113. The time which the homestead settler mentioned in section one hundred and twelve has served in the Army, Navy, or Marine Corps shall be deducted from the time heretofore required to perfect title; or if discharged on account of wounds received or disability incurred in the line of duty, then the term of enlistment shall be deducted from the time heretofore required to perfect title, without reference to the length of time he may have served; but no patent shall issue to any homestead settler who has not resided upon, improved, and cultivated his homestead for a period of at least one year after he shall have commenced his improvements.

SEC. 114. In case of the death of any person who would be entitled to a homestead under the provisions of section one hundred and twelve, his widow, if unmarried, or in case of her death or marriage, then his minor orphan children, by a guardian duly appointed and officially accredited at the General Land Office, shall be entitled to all the benefits enumerated in this chapter, subject to all the provisions as to settlement and improvement therein contained; but if such person died during his term of enlistment, the whole term of his enlistment shall be deducted from the time heretofore required to perfect the title.

SEC. 115. Every soldier, sailor, marine, officer, or other person coming within the provisions of section one hundred and twelve, may, as well by an agent as in person, enter upon such homestead by filing his application; but such claimant, in person or by his agent, shall, within the time prescribed, make his actual entry, commence residence and improvements on the same, and thereafter fulfill all the requirements of law.

SEC. 116. Each of the chiefs, warriors, and heads of families of the Stockbridge Munsee tribes of Indians, residing in the county of Shawana, State of Wisconsin, may, under the direction of the Secretary of the Interior, enter a homestead and become entitled to all the benefits of this chapter, free from any fee or charge; and any part of their present reservation which is abandoned for that purpose may be sold, under the direction of the Secretary of the Interior, and the proceeds applied for the benefit of such Indians as may settle on homesteads, to aid them in improving the same.

SEC. 117. The homestead secured by virtue of the preceding section shall not be subject to any tax, levy, or sale; nor shall it be sold, conveyed, mortgaged, or in any manner incumbered, except upon the decree of the district court of the United States, as provided in the following section.

SEC. 118. Whenever any of the chiefs, warriors, or heads of families of the tribes mentioned in section one hundred and sixteen, having filed with the clerk of the district court of the United States a declaration of his intention to become a citizen of the United States, and to dissolve all relations with any Indian tribe, two years previous thereto, appears in such court, and proves to the satisfaction thereof, by the testimony of two citizens, that for five years last past he has adopted the habits of civilized life; that he has maintained himself and family by his own industry; that he reads and speaks the English language; that he is well disposed to become a peaceable and orderly citizen; that he has sufficient capacity

to manage his own affairs, the court may enter a decree admitting him to all the rights of a citizen of the United States; and thenceforth he shall be no longer held or treated as a member of any Indian tribe, but shall be entitled to all the rights and privileges and be subject to all the duties and liabilities to taxation of other citizens of the United States. But nothing herein contained shall be construed to deprive such chiefs, warriors, or heads of families of annuities to which they are or may be entitled.

SEC. 119. That any Indian, born in the United States, who is the head of a family, or who has arrived at the age of twenty-one years, and who has abandoned, or may hereafter abandon, his tribal relations, shall, on making satisfactory proof of such abandonment, under rules to be prescribed by the Secretary of the Interior, be entitled to the benefits of this chapter, and of sections one hundred and fifty-three and one hundred and fifty-four of chapter ten of this act: *Provided*, That the title to lands acquired by any Indian by virtue hereof shall not be subject to alienation or incumbrance, either by voluntary conveyance or the judgment, decree, or order of any court, and shall be and remain inalienable for a period of ten years from the date of the patent issued therefor: *And provided further*, That any such Indian shall be entitled to his distributive share of all annuities, tribal funds, lands, and other property, the same as though he had maintained his tribal relations; and any transfer, alienation, or incumbrance of any interest he may hold or claim by reason of his former tribal relations shall be void.

Sec. 120. That in all cases in which Indians have heretofore entered public land under the homestead law, and have proceeded in accordance with the regulations prescribed by the Commissioner of the General Land Office, or in which they may hereafter be allowed to so enter under said regulations prior to the promulgation of regulations to be established by the Secretary of the Interior under the preceding section of this act, and in which the conditions prescribed by law have been or may be complied with, the entries so allowed are hereby confirmed, and patents shall be issued thereon, subject, however, to the restrictions and limitations contained in the next preceding section of this act in regard to alienation and incumbrance.

Sec. 121. That from and after the passage of this act the alternate sections reserved to the United States within the limits of any grant of public lands to any railroad company, or to any military road company, or to any State in aid of any railroad or military road, shall be open to settlers under the homestead laws to the extent of one hundred and sixty acres to each settler, and any person who has, under existing laws, taken a homestead on any section reserved to the United States within the limits of any railroad or military road land grant, and who by existing laws shall have been restricted to eighty acres, may enter under the homestead laws an additional eighty acres adjoining the land embraced in his original entry, if such additional land be subject to entry; or, if such persons so elect, he may surrender his entry to the United States for cancelation, and thereupon be entitled to enter lands under the homestead laws the same as if the surrendered entry had not been made; and the residence and cultivation of such person upon and of the land embraced in his original entry shall be considered residence and cultivation for the same length of time upon and of the land embraced in his additional or new entry, and shall be deducted from the three years residence and cultivation required by law: *Provided*, That in no case shall

patent issue upon an additional or new homestead entry under this act until the person has actually, and in conformity with the homestead laws, occupied, resided upon, and cultivated the land embraced therein at least one year: *And provided further*, That except as provided in this section all unapproved additional homestead rights shall be and are hereby repealed.

SEC. 122. Hereafter homestead applicants shall not be required to publish notice of their intention to make final proofs; but in cases of contest, parties interested shall be cited according to regulations to be prescribed by the Commissioner of the General Land Office.

SEC. 123. Whenever twenty or more persons severally qualified under the provisions of this chapter shall file in the proper district land office an application to form a homestead colony, together with a map of their proposed homestead colony, the register of said district land office shall receive and admit their separate filings for one hundred and sixty acres of land each, as in other homestead filings upon the arable lands of the United States.

Said homestead colonists shall be permitted to reside in a village by them to be formed, and to be shown upon the map, directed to be filed in the district land office, to be located as near as may be in the center of said colony; and the homestead colonists, upon whose tract the said village shall fall, are hereby authorized and permitted to give a deed for village purposes and occupation to the authorities of said village: *Provided*, That said deed shall not run as against the United States until after title has passed from the United States for the tract upon which the village is situated.

Continuous residence in said village, while cultivating and using for agricultural purposes their separate tracts, and said cultivation and use by said colonists, separately, for their own use and benefit, of the land embraced in their said entries, while residing in the said village, shall be considered equivalent to actual residence on their said lands.

When said colonists shall settle upon unsurveyed lands, they shall file the map and application before mentioned in the proper district land office, conforming, as nearly as can be ascertained, their separate claims to the size of the present legal subdivisions of the public lands; and they shall have possessory title to their separate lands, until the date of the return of the plat of the surveys of said lands to the district land office, after which time they shall proceed to acquire title in the manner set out and directed in this section for acquiring title to colony homesteads on surveyed lands. Joint entry of tracts in case of joint occupancy hereunder shall be permitted as in other homestead cases.

The provisions of this chapter, relating to homesteads on arable lands, shall, where the same are applicable, apply to entries under this section.

The Commissioner of the General Land Office is hereby required to make all proper rules and regulations for carrying into effect the above provisions of law.

SEC. 124. Where there is joint and several occupancy, at the date of the passage of this act, by duly qualified homestead settlers of the public lands, in quantities less than the present smallest legal subdivision of the public lands, it shall be lawful for one of said settlers and occupants to enter in trust under the homestead law the entire tract at the proper district land office, and to apportion to each of the several settlers or occupants their specific portions, and to make title to them after he or she shall have first obtained title to said tract under the homestead act from the United States.

SEC. 125. Any *bona fide* settler under the homestead laws of the

United States, who has filed the proper application to enter public lands in any district land office, and who has been subsequently appointed a Register of the Land Office, may perfect the title to the land by making the payments required by law, and furnishing proof of residence and cultivation up to the date of his appointment, to the satisfaction of the Commissioner of the General Land Office.

SEC. 126. The pre-emption law shall be, and is hereby, repealed; but nothing herein contained shall be so construed as to impair or interfere in any manner with existing pre-emption rights.

CHAPTER VII.

TIMBER CULTURE.

SEC. 127. Any person who has made or consummated a homestead entry under the laws of the United States, and who still resides upon said tract, shall be permitted to enter upon any vacant public lands contiguous to his or her tract eighty acres or less in legal subdivisions for timber culture, on which he or she shall plant, protect, and keep in a healthy growing condition for eight years ten acres of timber. He or she shall, at the expiration of said term, be entitled to a patent for the whole of said tract, or of such legal subdivision as the case may be, on making proof of such fact by not less than two credible witnesses and of full compliance with the further conditions provided in the following section.

SEC. 128. The person applying for the benefits of this act shall, upon application to the Register of the land district in which he or she is about to make such entry, make affidavit as follows, to wit: I,———— ————, having filed my application, No. ——, for an entry under the provisions of the timber culture act, do solemnly swear (or affirm) that I have heretofore filed an application for or entered a homestead, No. ——, under the laws of the United States, at the district land office at ———— ————; that I now reside upon the land embraced in the said homestead filing; that the section of land specified in my said application is composed exclusively of prairie lands, or other lands devoid of timber; that this filing and entry is made for the cultivation of timber, and for my own exclusive use and benefit; that I have made the said application in good faith, and not for the purpose of speculation, or directly or indirectly for the use or benefit of any other person or persons whomsoever; that I intend to hold and cultivate the land and to fully comply with the provisions of this said act; and that I have not heretofore made an entry under the timber culture act. And upon filing said affidavit with said register, and on payment of ten dollars, he or she shall thereupon be permitted to enter the quantity of land specified; and the party making an entry under the provisions of this act shall be required to break or plow five acres covered thereby the first year, five acres the second year, and to cultivate for crop or otherwise the five acres broken or plowed the first year; the third year he or she shall be required to cultivate for crop or otherwise the five acres broken the second year, and to plant in timber, seeds, or cuttings the five acres first broken or plowed, and to cultivate and put in crop or otherwise the remaining five acres, and the fourth year to plant in timber, seeds, or cuttings the remaining five acres: *Provided*, That in case such trees, seeds, or cuttings

shall be destroyed by grasshoppers, or by extreme and unusual drought, for any year or term of years, the time for planting such trees, seeds, or cuttings shall be extended one year for every such year that they are so destroyed: *Provided, further*, That the person making such entry shall, before he or she shall be entitled to such extension of time, file with the register of the proper land office an affidavit, corroborated by two witnesses, setting forth the destruction of such trees, and that, in consequence of such destruction, he or she is compelled to ask an extension of time, in accordance with the provisions of this act: *And provided further*, That no final certificate shall be given, or patent issued, for the land so entered, until the expiration of eight years from the date of such entry; and if, at the expiration of such time, or at any time within five years thereafter, the person making such entry, or, if he or she be dead, his or her heirs or legal representatives, shall prove by two credible witnesses that he or she or they have planted, and, for not less than eight years, have cultivated and protected such quantity and character of trees as aforesaid; that not less than twenty-seven hundred trees were planted on each acre, and that at the time of making such proof there shall be then growing at least six hundred and seventy-five living and thrifty trees to each acre, they shall receive a patent for such tract of land.

SEC. 129. If at any time after the filing of said affidavit, and prior to the issuing of the patent for said land, the claimant shall fail to comply with any of the requirements of this chapter, then and in that event such land shall be subject to entry under the homestead laws, or by some other person under the provisions of this chapter: *Provided*, That the party making claim to said land, either as a homestead settler or under this chapter, shall give at the time of filing his application such notice to the original claimant as shall be prescribed by the rules established by the Commissioner of the General Land Office; and the rights of the parties shall be determined as in other contested cases.

SEC. 130. That no land acquired under the provisions of this act shall in any event become liable to the satisfaction of any debt or debts contracted prior to the issuing of the final certificate therefor.

SEC. 131. That the Commissioner of the General Land Office is hereby required to prepare and issue such rules and regulations, consistent with this act, as shall be necessary and proper to carry its provisions into effect.

SEC. 132. And the fifth section of the act entitled "An act in addition to an act to punish crimes against the United States, and for other purposes," approved March 3, eighteen hundred and fifty-seven, shall extend to all oaths, affirmations, and affidavits required or authorized by this act.

SEC. 133. The parties who have already made entries under the acts approved March third, eighteen hundred and seventy-three, and March thirteenth, eighteen hundred and seventy-four, and June fourteenth, eighteen hundred and seventy-eight, shall be permitted to complete the same upon full compliance with the provisions of said acts.

CHAPTER VIII.

TOWN SITES.

SEC. 134. The President is authorized to reserve from the public lands, whether surveyed or unsurveyed, town-sites on the shores of har-

bors, at the junction of rivers, important portages, or any natural or prospective centers of population.

SEC. 135. When, in the opinion of the President, the public interests require it, it shall be the duty of the Commissioner of the General Land Office to cause any of such reservations, or part thereof, to be surveyed into urban or suburban lots of suitable size, and to fix, by appraisement of disinterested persons, their cash value, and to offer the same for sale at public outcry to the highest bidder, and thence afterward to be held subject to sale at private entry according to such regulations as the Commissioner of the General Land Office may prescribe; but no lot shall be disposed of at public sale or private entry for less than the appraised value thereof. And all such sales shall be conducted by the Register of the land office in the district in which the reservation may be situated, in accordance with the instructions of the Commissioner of the General Land Office.

SEC. 136. Whenever any portion of the public lands have been or may be settled upon and occupied as a town-site, it is lawful, in case such town be incorporated, for the corporate authorities thereof, and, if not incorporated, for the judge of the county court for the county in which such town is situated, to enter at the proper land office, and at the minimum price, the land so settled and occupied in trust for the several use and benefit of the occupants thereof, according to their respective interests; the execution of which trust, as to the disposal of the lots in such town, and the proceeds of the sales thereof, to be conducted under such regulations as may be prescribed by the legislative authority of the State or Territory in which the same may be situated. Any act of the trustees not made in conformity to the regulations in in this section shall be void.

SEC. 137. The entry of the land provided for in the preceding section shall be made, or a declaratory statement of the purpose of the inhabitants to enter it as a town-site shall be filed, with the Register of the proper land office, and the entry or declaratory statement shall include only such land as is actually occupied by the town, and the title to which is in the United States; but in any Territory in which a land office may not have been established, such declaratory statements may be filed with the surveyor general of the surveying district in which the lands are situated, who shall transmit the same to the General Land Office.

SEC. 138. It shall be lawful for any town which has made, or may hereafter make, entry of less than the maximum quantity of land named in section 143, to make such additional entry or entries, of contiguous tracts, which may be occupied for town purposes, as, when added to the entry or entries theretofore made, will not exceed twenty-five hundred and sixty acres: *Provided*, That such additional entry shall not, together with all prior entries, be in excess of the area to which the town may be entitled at date of the additional entry by virtue of its population, as prescribed in said section.

SEC. 139. No title shall be acquired, under the foregoing provisions of this chapter, to any mine of gold, silver, cinnabar, or copper, or to any valid mining claim or possession held under existing laws.

SEC. 140. The provisions of this chapter shall not apply to military or other reservations heretofore made by the United States, nor to reservations for light-houses, custom-houses, mints, or other such public purposes as the interests of the United States may require, whether held under reservations through the Land Office by title derived from the Crown of Spain or otherwise.

SEC. 141. In the patent to be issued by the United States for any town-site on mineral lands, under this act, there shall be recognized the underground and surface rights, recognized by local authority or law, of persons owning or possessing mining veins, and the surface rights of the owners or possessors of town lots, together with the necessary use thereof; but nothing contained in this section shall be so construed as to recognize any color of title in possessors for mining purposes, as against the United States.

There shall be inserted in mining patents for claims within the exterior limits of a town, under this act, the following clause: "Excepting and excluding from these presents all town property rights upon the surface, and there are hereby expressly excepted and excluded from the same, all houses, buildings, and structures, lots, blocks, streets, alleys, or other municipal improvements on the surface of the above premises, not belonging to the grantees herein, and all rights necessary or proper to the occupation, possession, and enjoyment of the same."

In the patent to be issued for a town site under this act there shall be inserted the following clause: "*Provided*, That no title shall be hereby acquired to any mine of gold, silver, cinnabar or copper, or to any valid mining claim or possession held under existing laws: *And provided, further*, That the grant hereby made is held and declared to be subject to all the conditions and restrictions contained in section — of the Revised Statutes of the United States, so far as the same are applicable thereto."

SEC. 142. The several counties and parishes of each State and Territory, where there are public lands, are authorized to enter, at the minimum price for which public lands of the United States are sold, one-quarter section of vacant land in each of the counties or parishes, in trust for such counties or parishes respectively, for the establishment of seats of justice therein; but the proceeds of the sale of each of such quarter sections shall be appropriated for the purpose of erecting public buildings in the county or parish for which it is located, after deducting therefrom the amount originally paid for the same; and the seat of justice for such counties or parishes, respectively, shall be fixed previously to a sale of the adjoining lands within the county or parish for which the same is located.

SEC. 143. If upon surveyed lands, the entry provided in section one hundred and thirty-six shall in its exterior limit be made in conformity to the legal subdivisions of the public lands authorized by law; and where the inhabitants are in number one hundred, and less than two hundred, shall embrace not exceeding three hundred and twenty acres; and in cases where the inhabitants of such town are more than two hundred, and less than one thousand, shall embrace not exceeding six hundred and forty acres; and where the number of inhabitants is one thousand and over one thousand, shall embrace not exceeding twelve hundred and eighty acres; but for each additional one thousand inhabitants, not exceeding five thousand in all, a further grant of three hundred and twenty acres shall be allowed.

SEC. 144. The words "not exceeding five thousand in all," in the preceding section, shall not apply to Salt Lake City, in the Territory of Utah; but such section shall be so construed in its application to that city that lands may be entered for the full number of inhabitants contained therein not exceeding fifteen thousand; and as that city covers school-section number thirty-six, in township number one north, of range number one west, the same may be embraced in such entry, and indemnity shall be given therefor when a grant is made by Con-

gress of sections sixteen and thirty-six, in the Territory of Utah, for school purposes.

SEC. 145. The existence or incorporation of any town upon the public lands of the United States shall not be held to exclude from homestead entry a greater quantity than twenty-five hundred and sixty acres of land, or the maximum area which may be entered as a town-site under existing laws, unless the entire tract claimed or incorporated in such town-site shall, including and in excess of the area above specified, be actually settled upon, inhabited, improved, and used for business and municipal purposes.

SEC. 146. Whenever the corporate limits of any town upon the public domain are shown or alleged to include lands in excess of the maximum area specified in section one hundred and forty-three of this act, the Commissioner of the General Land Office may require the authorities of such town (and it shall be lawful for them) to elect what portion of said lands in compact form and embracing the actual site of the municipal occupation and improvement shall be withheld from homestead entry; and thereafter the residue of such lands shall be open to disposal under the homestead laws. And upon default of said town authorities to make such selections within sixty days after notification by the Commissioner, he may direct testimony respecting the actual location and extent of said improvements to be taken by the Register of the district in which such town may be situated; and upon receipt of the same he may determine and set off the proper site according to section one hundred and forty-three of this act, and declare the remaining lands open to settlement and entry under the homestead laws; and it shall be the duty of the Secretary of each of the Territories of the United States to furnish the Surveyor General of the Territory, for the use of the United States, a copy duly certified of every act of the Legislature of the Territory incorporating any city or town, the same to be forwarded by such Secretary to the Surveyor General within one month from date of its approval.

CHAPTER IX.

IRRIGABLE LANDS.

SEC. 147. It shall be lawful for any citizen of the United States, or any person of requisite age, who may be entitled to become a citizen, and who has filed his declaration to become such, and upon payment of twenty-five cents per acre, to file a declaration, under oath, with the Register of the land district in which any irrigable land is situated, that he intends to enter and reclaim a tract or tracts of irrigable land by conducting water upon the same within the period of three years thereafter. Said declaration shall describe particularly said land, if surveyed, and, if unsurveyed, shall describe the same as nearly as possible without a survey, and each tract of land shall be in a compact form, except that where the same is within a railroad grant it shall be deemed compact if in a form which, including the sections so granted, would be compact. At the time of filing the declaration, the party shall also file a map of said land, which shall exhibit a plan showing the mode of contemplated irrigation, and which plan shall be sufficient to thoroughly irrigate all of said land; and persons taking up separate tracts of irrigable land shall have the right to associate together in the construction of canals and ditches for irrigating all of said tracts, and may file a joint map or maps, showing their plan of intended improvements.

SEC. 148. No land shall be patented to any person under this chapter unless he or his assigns shall have expended in the necessary reclamation thereof at least two dollars per acre of the whole tract reclaimed and patented. The determination of what may be considered irrigable land shall be subject, under the limitations of this act, to the provisions of section ninety of this act and the regulations of the Commissioner of the General Land Office.

SEC. 149. At any time within the period of three years after filing the declaration, affidavit, maps and plans named herein, upon making satisfactory proof to the Register of the reclamation of said land to the extent and cost, and in the manner aforesaid, and substantially in accordance with the plans herein provided for, and upon the payment to the Register of the additional sum of one dollar per acre for said land, a patent shall issue therefor.

SEC. 150. All locations of irrigable or desert lands heretofore made under an act entitled "An act to provide for the sale of desert lands in certain States and Territories," approved March third, one thousand eight hundred and seventy-seven, may be re-entered under this act by the persons making the same, or by their successors in interest or assigns, upon their filing with the Register of the land district the declarations, affidavits, maps and plans required under this chapter; and such persons shall have three years from the passage of this act to complete the reclamation of such lands; and the payment of twenty-five cents per acre originally made by them shall be considered as the first payment required under this act.

SEC. 151. The right to the use of water by the person conducting the same on or to any tract of irrigable land shall depend on *bona fide* prior appropriation; and such right shall not exceed the amount of water actually appropriated and necessarily used for the purpose of irrigation and reclamation; and all surplus water over and above such actual appropriation and use, together with the water of all lakes, rivers, and other sources of water supply upon the public lands, and not navigable, shall remain and be held free for the appropriation and use of the public for irrigation, mining, and manufacturing purposes, subject to existing rights.

CHAPTER X.

PASTURAGE LANDS.

SEC. 152. From and after the 1st day of January, A. D. 1881, all surveyed public lands of the United States, classified as pasturage lands under this act, excepting such of those lands as are legally occupied under the laws of the United States, shall be subject to purchase at private sale, upon application by any person at the respective district land offices of the United States, for the sum of $1.25 per acre.

On and after January 1, A. D. 1886, the surveyed lands not legally occupied under laws of the United States, and classified as above, and remaining unsold, shall be sold as above directed at $1 per acre.

On and after January 1, A. D. 1890, any lands classified as above set out, and not legally occupied under the laws of the United States, remaining unsold, shall be sold for seventy-five cents per acre. After the year A. D. 1890, the price of said lands shall be decreased twelve and one-half cents per acre each three years they shall remain unsold, until they shall reach twelve and one-half cents per acre, at which price

they shall be sold, but for no less sum: *Provided*, That as to lands unsurveyed on the first day of January, A. D. 1881, said land shall be subject to private sale at one dollar and a quarter per acre for five years after survey, and thereafter they shall decrease in price upon a graduation of time and value equivalent to that herein provided for for lands now surveyed.

Provided, however, That nothing in this section shall in any manner prohibit or interfere with settlement on said pasturage lands, or their withdrawal from private sale by settlement under the homestead, pasturage homestead, or irrigation laws.

The Commissioner of the General Land Office shall make all needful rules and regulations for carrying into effect the above provisions of law.

SEC. 153. Any person qualified under the provisions of this act to make entry of a homestead on the arable lands of the United States may, upon application at the proper district land office, be permitted to file a homestead upon the pasturage lands of the United States: *Provided*, That no one separate entry shall embrace more than four sections or two thousand five hundred and sixty acres of such pasturage lands, and the same shall lie in a compact body. *And provided further*, That the applicant shall pay to the United States, at the time of making his application, one hundred dollars.

SEC. 154. That the provisions of this act relating to homesteads upon the arable lands of the United States, and the provisions of this act authorizing the formation of homestead colonies, through separate individual entries upon the surveyed and unsurveyed arable lands of the United States, shall, as far as they may be applicable as to term, location, entry, character of occupancy, settlement and village residence, apply to entries under this section: *Provided*, That such contiguous village lots may each contain not more than twenty acres of land, and may be selected from either irrigable or pasturage lands. *And provided further*, That use for grazing purposes of the lands embraced in a pasturage homestead entry, with residence upon the tract, or in a colony village, shall be in lieu of actual cultivation and use for agricultural purposes.

CHAPTER XI.

TIMBER LANDS.

SEC. 155. All timber lands, excepting those bearing mineral, which are chiefly valuable for timber of commercial value, as sawed or hewed timber, are hereby withdrawn from sale or other disposal.

SEC. 156. All timber exceeding eight inches in diameter growing or being upon the even-numbered sections of public land, which are chiefly valuable for timber of commercial value, as sawed or hewed timber, may be sold for cash in lots of not less than forty acres nor greater than six hundred and forty acres, or one section containing more or less than six hundred and forty acres: *Provided*, That this section shall not apply to lands reserved by competent authority. All moneys derived from the sale of timber shall be accounted for and covered into the Treasury in the same manner as moneys received from the sale of public lands.

SEC. 157. In the sale of timber from the public lands there shall be three grades, with a fixed price for each grade. The price of the first grade shall be dollars per acre; the price of the second grade shall be dollars per acre; and the price of the third grade

shall be dollars per acre. The grading of the timber shall be done by the deputy surveyors at the time of the surveys of said lands, and the kind and character of timber on each section so surveyed shall be noted in the field notes and marked upon the township plats. In case of contest said grading shall become a matter of proof, as in other cases provided in this act in matters relating to the character of the public lands. Timber upon lands surveyed before the passage of this act shall be classified and graded under the direction of the Commissioner of the General Land Office.

SEC. 158. The Commissioner of the General Land Office is hereby authorized to appoint such officers as Congress may from time to time appropriate for, which officers shall, under the direction of the said Commissioner, act as agents for the preservation of the timber on the public lands and for the prevention and suppression of depredations thereon, and shall perform such other duties as may be assigned them in connection with the public land service.

SEC. 159. Every person purchasing timber under the provisions of this chapter shall remove the timber from the land within five years from the date of notice to be given by the Commissioner of the General Land Office, and thereafter he shall have no right to, or claim upon, any timber remaining upon said lands, nor upon the purchase-money paid therefor; and any sale made under this chapter shall be subject to this express condition.

SEC. 160. All timber standing upon the public lands shall, after purchase as herein provided, become subject to taxation in accordance with the laws of the States or Territories in which the same may be situated.

SEC. 161. All citizens of the United States and other persons *bona fide* residents thereof, shall be, and are hereby, authorized and permitted to fell and remove, or cause to be felled and removed, for building, agricultural, mining, and other purposes, but not for purposes of sale, commerce or export, any timber or other trees growing or being on the public lands not subject to entry under this act, and whether upon surveyed or unsurveyed lands; but subject to such rules and regulations as the Secretary of the Interior may prescribe for the protection of the timber and undergrowth growing upon such lands.

SEC. 162. Any person who shall cut, or cause, or procure to be cut, or aid, or assist, or be employed in cutting, or shall wantonly destroy, or cause, or procure to be wantonly destroyed, or aid, or assist, or be employed in wantonly destroying any timber, standing, growing, or being on any lands of the United States, including Indian reservations, excepting upon lands reserved for military and naval purposes, while held in such reservation, and not subject to the control of the Department of the Interior, shall pay a fine of not less than triple the value of the trees or timber so cut, destroyed, or removed, and shall be imprisoned not exceeding twelve months.

SEC. 163. If the master, owner, or consignee, of any vessel shall knowingly take on board any timber cut on the public lands of the United States without authority of law, the vessel on board of which the same shall be taken or seized, shall, with the tackle, apparel, and furniture, be wholly forfeited to the United States, and the captain or master of such vessel wherein the same was exported to any foreign country against the provisions of this section, shall forfeit and pay to the United States a sum not exceeding twice the value of the timber so transported on board his vessel.

SEC. 164. It shall be the duty of all collectors of customs within the States of Florida, Alabama, Mississippi, Louisiana, California, and

Oregon, and in Washington Territory, before allowing a clearance to any vessel laden in whole or in part with lumber or timber, to ascertain satisfactorily that such timber was cut from private lands, or cut from public ones by the consent of the Interior Department. And it is also made the duty of all officers of the customs, and of the land officers within those States, and within Washington Territory, to promptly inform the Secretary of the Interior of the acts and offenses of all persons known to them against the provisions of this law.

SEC. 165. All penalties and forfeitures incurred under the provisions of sections one hundred and sixty-three and one hundred and sixty-four of this act shall be sued for, recovered, and accounted for, under the directions of the Secretary of the Interior, and the Secretary is authorized to mitigate in whole or in part on such terms and conditions as he deems proper, by an order in writing, any fine, penalty, or forfeiture so incurred; and all actions or causes of actions, either civil or criminal, for depredations committed by cutting or removing timber from the public lands, prior to the passage of this act are hereby condoned and quashed: *Provided*, That in all cases where suits have been commenced, the dismissal of the cases shall be at the cost of defendants.

SEC. 166. Nothing contained in the four preceding sections shall be construed as repealing sections 2460, 2461, 2462, 2463, and 4751 of the Revised Statutes, but the same shall be of general application.

CHAPTER XII.

MINERAL LANDS.

SEC. 167. The public lands of the United States, classified by law as mineral lands, shall be reserved from sale or disposal, except as expressly directed by law.

SEC. 168. All valuable mineral deposits in public lands of the United States, both surveyed and unsurveyed, are hereby declared to be free and open to exploration, and surface and subterranean prospecting. The lands in which such mineral deposits are found shall be open to occupation and purchase by citizens of the United States, and those who have declared their intention to become such, upon the terms and conditions hereinafter prescribed.

SEC. 169. Any mining claims located after the day of , 1880, shall be bounded as to surface by straight lines, and all right to minerals contained therein shall be confined within vertical planes passing downward through said straight boundary lines.

SEC. 170. A mining claim located after day of may equal but shall not exceed a square of feet on the side, and the same may be in any shape, so that neither length nor breadth shall exceed feet, nor the aggregate area exceed that of the square hereinbefore first described.

SEC. 171. Proof of citizenship under this chapter may consist, in the case of an individual, of his own affidavit thereof; in the case of an association of persons unincorporated, of the affidavit of their authorized agent, made on his own knowledge or upon information and belief; and in the case of a corporation organized under the laws of the United States, or of any State or Territory thereof, by the filing of a certified copy of their charter or certificate of incorporation.

SEC. 172. All future occupation, location or purchase of public min-

eral lands shall be governed by laws of Congress, to the exclusion of all local customs and regulations and State or Territorial laws.

SEC. 173. No title, or valid claim to title, to public mineral lands shall be acquired as against the United States or third parties, except upon compliance with the following conditions and requirements.

SEC. 174. Any qualified person may acquire such claim or title:

First. By marking the position of his claim by monuments upon the ground and by posting notices thereon. Said monuments shall consist either of firmly set wooden stakes, not less than six inches square, and not less than three feet above ground; or of well set piles of stones not less than four feet square at the base and not less than three feet high, posted at each exterior angle of the claim. The northeasternmost monument shall be the initial point for description and survey, and shall be conspicuously marked "O." Said notices shall, within five days from the establishment of the monuments, be posted conspicuously upon each of said monuments, and, in addition thereto, at least three of said notices shall be posted upon conspicuous places within the interior of said claim. Said notices shall be dated with the establishment of said monuments, shall describe the exterior boundaries of the claim by specific reference to the monuments established on the ground, and shall note the approximate courses and distances passing southerly, westwardly, northerly, and eastwardly from the initial monument around the entire boundary closing upon said initial monument. A specific form of notice shall be prescribed by the Commissioner of the General Land Office to embody the foregoing requirements, and be so explicit as to operate as notice to third parties.

Second. By the discovery within said claim of a lode, placer, or other valuable mineral deposit, either before the posting of said notice or within ninety days thereafter.

Third. Within ninety days from the posting of said notice, the locator shall file with the United States Surveyor General for the surveying district in which the claim lies a copy of said posted notices, together with proof of mineral discovery and an application for survey of his claim, and evidence that he has deposited to the credit of the United States in a proper United States depositary the sum of fifty dollars, which deposit shall be deemed an addition to the appropriation for the survey of the public lands. Said proof shall consist of affidavits of the locator and of two disinterested persons, and the fact of said mineral discovery shall be subject to such further proof or verification as the Commissioner of the General Land Office may deem necessary. Said application shall be in writing, signed by the locator.

Fourth. Within one year from the approval by the United States Surveyor General of said survey, the locator, his assigns, or his duly authorized agent, who has or have complied with the terms of this chapter, shall file in the proper land office an application for patent under oath, showing such compliance, together with a copy of the plat and field notes of the claim, duly certified by the United States Surveyor General, and proof that $500 worth of labor has been expended or of improvements made upon the claim by the claimant or his grantors. Said proof shall consist of the affidavits of the claimant or his duly authorized agent, corroborated by the affidavits of two disinterested witnesses, which shall set forth the facts in sufficient detail to satisfy the Commissioner of the General Land Office that the said mineral claim has been worked in good faith. Upon the filing of the application and plat and making the above-required proof, and upon payment to the proper officers of

per acre in full for the acreage of his claim, the claimant shall be entitled to a patent for his said claim.

SEC. 175. The right of assignment of a mineral claim after approval of survey by the United States Surveyor General is hereby expressly authorized, but such assignment shall confer no right as against the United States, and shall simply substitute an assignee in place of his grantors. No assignment prior to survey shall be recognized.

SEC. 176. Failure by a locator to make application for survey and satisfactorily prove the mineral discovery within ninety days after the posting of the notices shall subject his claim to location by any other qualified party.

SEC. 177. Failure of the claimant to make proof of work and payment within the time hereinbefore prescribed shall work a complete forfeiture of the claim, and the survey theretofore made shall be canceled.

SEC. 178. On or before , 1880, the Commissioner of the General Land Office shall divide the territory west of the 100th meridian into mineral districts, so that each Surveyor General's district shall be made up of one or more mineral districts, having due regard to the number of surveys of mineral claims and applications for the same.

SEC. 179. The Surveyor General shall—

First. Cause to be established in all mining neighborhoods or districts permanent neighborhood or district initial mineral monuments, which shall serve as initial reference points for mining claim surveys, and which shall be connected by trigonometrical measurement with mineral base lines, to be established and measured by such methods as may be prescribed by law.

Second. He shall cause to be determined by trigonometrical measurement the exact course and distance between said initial district mineral monuments and the hereinbefore described initial claim monuments.

Third. He shall receive, place on file, and record, in a book kept in his office for that purpose, every application for the survey of a mining claim, together with the original location notice of the claimant.

Fourth. When two or more locators make application to a Surveyor General for the survey of the same tract, either in whole or in part, and neither survey has theretofore been approved, the right to approval shall be in him who made the first location on the ground; and such priority of location shall, in the first instance, be determined by the officer in the field, and any party aggrieved thereby may, within ninety days after such determination, appeal to the United States Surveyor General, by whom the question may be reviewed, upon notice to the appellee, and after reasonable opportunity for the introduction of proof by both parties.

Fifth. He shall cause some duly appointed deputy mineral surveyor, chosen by the applicant for survey, to execute a survey of each claim for which an application is filed in his office, and to return the plat and field notes of said survey to his office.

Sixth. He shall keep in his office connected maps of all mining neighborhoods in his district, upon which shall be shown the positions of all mineral monuments and their relations to leading topographical features in their immediate vicinity, and the positions of all surveyed claims which do not overlap previously surveyed claims, numbering said surveys consecutively in the order of the return of plats and field notes by deputy mineral surveyors. He shall ascertain in whatever mode he shall deem most practicable the location of all mining claims heretofore surveyed or patented and shall delineate the same upon the connected district maps as accurately as possible. On the return of the said plats

and field notes by the deputy mineral surveyor, the Surveyor General, having caused the trigonometrical measurement as hereinbefore provided to be made between the nearest initial district mineral monument and the initial monument of the mining claim, shall apply said mineral claim survey to his district map and, provided said claim or any part thereof does not overlap any previously applied plat and is otherwise correct, he shall approve said survey and within ten days thereafter shall delineate it upon said district map and make two full copies of said plat and field notes, forwarding one to the Commissioner of the General Land Office and the other to the Register of the proper land office. Said district map shall be open to examination by the public. Copies of all approved surveys shall be furnished to interested parties on payment of costs as fixed by the Commissioner of the General Land Office. If the said Surveyor General applies any duly returned plat to said district maps, and said plat is found to conflict with or overlap a previously approved survey said Surveyor General shall withhold approval thereof, and no legal effect shall attach to the same by reason of its having been made in the field nor by reason of any approval thereof if the same should inadvertently or accidentally be approved in conflict with prior approval.

SEC. 180. It shall be the duty of each Surveyor General within whose surveying district any mineral surveys have been or shall be made, and within thirty days after expiration of the ten days above mentioned, to furnish, free of cost, to each district land office and to the recorder of each county certified copies of such of said connecting maps as may embrace lands within the limits of said land district or within said counties, respectively; and copies shall also be furnished to deputy mineral surveyors at the discretion of the said Surveyor-General.

SEC. 181. Within thirty days after approval of any subsequent survey it shall be the duty of each Surveyor General to furnish to each district land office and to the several county recorders a certified copy of such of said subsequent surveys as may fall within said land district and counties, respectively, and the district land offices shall forthwith cause said survey to be immediately delineated in its proper position upon the connecting maps theretofore furnished them.

SEC. 182. Each of said connecting maps shall show in a marginal table the date of approval of the several surveys delineated thereon, and said marginal table shall be regularly continued as subsequent surveys are added to said connecting maps. Each copy hereinbefore provided for shall also exhibit the exact date of such approval or approvals.

SEC. 183. In the event that proof of *bona fide* development and payment of purchase money shall not be made or tendered within the year heretofore prescribed, it shall be the duty of the Register of the proper land office to notify the Commissioner of the General Land Office, who shall forthwith cause said survey to be cancelled in all the offices under his control, and shall cause notice thereof to be sent to the recorder of the county wherein the cancelled survey was situate. After said cancellation no right or claim of any character shall survive in any party by reason of said survey, and the land embraced therein shall be subject to the claim of any intervening or subsequent party, as if no such survey had ever been made or applied for.

SEC. 184. Copies of said connecting maps shall also be furnished to the Commissioner of the General Land Office, who shall cause the same to be continuously perfected, as hereinbefore prescribed as to other offices.

SEC. 185 If any Surveyor General, wilfully or negligently omits to

promptly perform the duties prescribed in this chapter, it shall be considered sufficient cause for his dismissal from office.

SEC. 186. If at any time after application for survey, and prior to application for patent, it shall be proved, after personal notice to the mineral claimant, to the satisfaction of the Register of the proper land district, that said claimant has left his surveyed claim with the intention of not complying with the provisions of this chapter, the right of said claimant shall cease and determine, after notice in the usual form to the claimant of said decision by the district Register; and in the absence of appeal to the Commissioner of the General Land Office, the latter officer shall cause the cancellation of the said survey, as hereinbefore provided.

SEC. 187. The Surveyors General of the United States may appoint in their respective districts as many competent surveyors, furnishing satisfactory evidence of professional capacity, and giving bond in the penal sum of $10,000, as shall apply for appointment to survey mineral claims. The expense of surveying claims shall be paid by the applicants, and they shall be at liberty to obtain the same at the most reasonable rates; and they shall also be at liberty to employ any United States deputy surveyor to make the survey.

SEC. 188. The Commissioner of the General Land Office shall also have power to establish the maximum of charges for surveying, and any deputy surveyor proved to have exceeded this maximum shall forfeit his commission, and shall not thereafter be eligible for appointment.

SEC. 189. All affidavits required to be made under this chapter may be verified before any judge or clerk of a court of record, or before any officer authorized to administer oaths, whose official capacity shall be properly verified; and all testimony and proofs may be taken before any such officer, and when duly certified by the officer taking the same shall have the same force and effect as if taken before the Register of the land office. In cases of contest as to the mineral or agricultural character of the land, the testimony and proofs may be taken as herein provided, on personal notice of at least ten days to the opposing party, or if such party cannot be found, then by the publication of at least once a week for thirty days in a newspaper to be designated by the Register of the land office as published nearest to the location of such land, and the Register shall require proof that such notice has been given.

SEC. 190. All rights which have attached to mining claims under previous acts of Congress shall not be affected by the operations of this chapter: *Provided*, That where such claims have not been or shall not within one year thereafter be consummated by the required payment of purchase money, such unconsummated claims shall lapse, and the land embraced therein shall thereafter be subject only to the operations of this chapter.

SEC. 191. Where land is used or occupied by the proprietor of a mining claim for mining or mill purposes, such land may be embraced and included in an application for a patent for such mining claim, and the same may be patented therewith, subject to the same preliminary requirements as to survey and notice as are applicable to mineral claims; but no location hereafter made of such mill-site shall exceed five acres, and the same must be paid for at the same rate as fixed by this chapter for the superficies of the mineral claim. The owner of reduction works, not owning a mine in connection therewith, may also receive a patent for his mill-site as provided in this section.

SEC. 192. As a condition of sale, in the absence of necessary legisla-

tion by Congress, the local Legislature of any State or Territory may provide rules for working mines, involving easements, drainage, and other necessary means to their complete development; and this condition shall be fully expressed in the patent.

SEC. 193. Whenever, by priority of possession, rights to the use of water for mining, agricultural, manufacturing, or other purposes, have vested and accrued, and the same are recognized and acknowledged by the local customs, laws, and the decisions of courts, the possessors and owners of such vested rights shall be maintained and protected in the same, and the right of way for the construction of ditches and canals for the purposes herein specified is acknowledged and confirmed; but whenever any person, in the construction of any ditch or canal, injures or damages the possession of any settler on the public domain, the party committing such injury or damage shall be liable to the party injured for such injury or damage.

SEC. 194. All patents granted, or pre-emption or homesteads allowed, shall be subject to any vested and accrued water-rights, or rights to ditches and reservoirs used in connection with such water-rights, as may have been acquired under or recognized by the preceding section.

SEC. 195. Wherever, upon the lands heretofore improperly designated as mineral lands, which have been excluded from survey or sale, there have been homesteads made by citizens of the United States, or persons who have declared their intention to become citizens, which homesteads have been made, improved, and used for agricultural purposes, and upon which there have been no valuable mines of gold, silver, cinnabar, lead, copper, coal, iron, or other valuable deposit discovered, and which are properly agricultural lands, the settlers or owners of such homesteads shall have a right to avail themselves of the provisions of chapter sixth of this title, relating to homesteads.

SEC. 196. Upon the survey of the lands described in the preceding section, the Secretary of the Interior may designate and set apart such portions of the same as are clearly agricultural lands, which lands shall thereafter be subject to homestead and sale as other public lands, and be subject to all the laws and regulations applicable to the same.

SEC. 197. The President is authorized to establish additional land districts, and to appoint the necessary officers under existing laws, wherever he may deem the same necessary for the public convenience in executing the provisions of this chapter.

SEC. 198. The provisions of the preceding sections of this chapter shall not apply to the mineral lands situated in the States of Michigan, Wisconsin, and Minnesota, which are declared free and open to exploration and purchase, according to legal subdivisions, in like manner as before the tenth day of May, eighteen hundred and seventy-two. And any *bona-fide* entries of such lands within the States named, since the tenth day of May, eighteen hundred and seventy-two, may be patented without reference to any of the foregoing provisions of this chapter. Such lands shall be offered for public sale in the same manner, at the same minimum price, and under the same rights of pre-emption as other public lands.

SEC. 199. No act passed by Congress, granting lands to States or corporations to aid in the construction of roads or for other purposes, or to extend the time of such grants, shall be so construed as to embrace mineral lands, which in all cases are reserved exclusively to the United States, unless otherwise specially provided in the act or acts making the grant.

SEC. 200. Section 2323 of the Revised Statutes of the United States, relating to tunnel rights, is hereby repealed.

SEC. 201. Every person above the age of twenty-one years, who is a citizen of the United States, or who has declared his intention to become such, or any association of persons severally qualified as above, shall, upon application to the Register of the proper land office, have the right to enter, by legal subdivisions in a compact body, any quantity of vacant public lands of the United States containing coal and iron valuable for domestic or commercial purposes, not exceeding three hundred and twenty acres, and not otherwise appropriated or reserved by competent authority, upon payment to the Register of not less than ten dollars per acre for such lands.

SEC. 202. Where any such person or association of persons shall have opened or improved any coal or iron mine upon unsurveyed public lands, and shall be in actual possession of the same, such person or association shall be entitled after survey to a preference right of entry of such lands: *Provided*, That said entry shall be effected within sixty days after publication of notice of return of the township plat to the district land office.

SEC. 203. The two preceding sections shall be held to authorize only one entry by the same person or association of persons; and no association of persons, any member of which shall have taken the benefit of such sections either as an individual or as a member of any other association, shall hold or enter any other lands under the provisions thereof; and no member of any association which shall have taken the benefit of such sections shall enter or hold any other lands under their provisions.

SEC. 204. In case of conflicting claims for the purchase of coal or iron lands, where the right of either party was initiated when the lands were unsurveyed, priority of possession and improvement, followed by continuous and *bona-fide* occupation, shall determine the preference right to purchase; but joint purchase shall be allowable on consent of the parties, or when, in the judgment of the Commissioner of the General Land Office, the conflict was created without notice of any prior claim.

SEC. 205. Nothing in the four preceding sections shall be construed to destroy or impair any rights which may have attached prior to the passage of this act, or to authorize the sale of lands valuable for mines of gold, silver, or copper. The Commissioner of the General Land Office is authorized to issue all needful rules and regulations for carrying into effect the provisions of this and the four preceding sections.

CHAPTER XIII.

PRIVATE LAND CLAIMS.

SEC. 206. It shall and may be lawful for any person or persons, or their legal representatives, claiming lands within the limits of the territory derived by the United States from the Republic of Mexico and now embraced within the Territories of New Mexico, Wyoming, Arizona, or Utah, or within the States of Nevada or Colorado, by virtue of such lawful Spanish or Mexican grant, concession, warrant, or survey as the United States are bound to recognize by virtue of the treaties of cession of said country by Mexico to the United States, which, at the date of the passage of this act, have not been confirmed by act of Congress, or otherwise decided upon by lawful authority, in every such case to present a petition, in writing, to the judge of the district court of the United States in a State or Territory for the judicial district in which

such lands may be situate, setting forth fully the nature of their claims to the lands, and particularly stating the date and form of the grant, concession, warrant, or order of survey under which they claim, by whom made, the name or names of any person or persons in possession of or claiming the same, or any part thereof, otherwise than by the lease or permission of the petitioner; and, also, the quantity of land claimed and the boundaries thereof, where situate, with a map showing the same as near as may be; and whether the said claim has heretofore been confirmed, considered, or acted upon by Congress, or the authorities of the United States, or been heretofore submitted to any authorities constituted by law for the adjustment of land-titles within the limits of the said territory so acquired, and by them reported on unfavorably or recommended for confirmation, or authorized to be surveyed or not; and praying in such petition that the validity of such title or claim may be inquired into and decided. And the said courts respectively are hereby authorized and required to take and exercise jurisdiction of all cases or claims presented by petition in conformity with the provisions of this act, and to hear and determine the same, as hereinafter provided, on the petition and proofs in case no answer or answers be filed after due notice, or on the petition and the answer or answers of any person or persons interested in preventing any claim from being established, and the answer of the district attorney, where he may have filed an answer, and such testimony and proofs as may be taken; and a copy of such petition, with a citation to any adverse possessor or claimant, shall, immediately after the filing of the same, be served on such possessor or claimant in the ordinary legal manner of serving such process in the proper State or Territory, and in like manner on the district attorney of the United States; and it shall be the duty of the United States attorney for the proper district, as also any adverse possessor or claimant, after service of petition and citation, as hereinbefore provided, within thirty days, unless further time shall, for good cause shown, be granted by the judge or court to whom said petition is presented, to enter an appearance, and plead, answer, or demur to said petition; and in default of such plea, answer, or demurrer being made within said thirty days, or within the further time which may have been granted as aforesaid, the court shall proceed to hear the cause on the petition and proofs, and render a final decree according to the provisions of this act; and in no case shall a decree be entered otherwise than upon full legal proof and hearing; and in every case the court shall require the petition to be sustained by satisfactory proofs, whether an answer or plea shall have been filed or not.

SEC. 207. All proceedings subsequent to the filing of said petition shall be conducted as near as may be according to the rules of the courts of equity in the proper Territory or court of the United States in the States, except that the answer of the attorney of the United States shall not be required to be verified by his oath, and no continuance shall be granted unless for good cause shown; and the said courts shall have full power and authority to hear and determine all questions arising in said case relative to the title of the claimants, the extent, locality, and boundaries of said claim, or other matters connected therewith, fit and proper to be heard and determined, and by a final decree to settle and determine the question of the validity of the title and the boundaries of the grant or claim presented for adjudication, according to the law of nations, the stipulations of the treaty concluded between the United States and the Republic of Mexico, at the city of Guadalupe Hidalgo, on the second day of February, in the year of our Lord one thousand eight

hundred and forty-eight, or the treaty concluded between the same powers at the city of Mexico, on the thirtieth day of December, in the year of our Lord one thousand eight hundred and fifty-three, and the laws and ordinances of the government from which it is alleged to have been derived, and all other questions properly arising between the claimants or other parties in the case and the United States, which decree shall in all cases refer to the treaty, law, or ordinance under which such claim is confirmed or rejected; and in all cases the party against whom the judgment or decree of said district court may be finally rendered shall be entitled to an appeal to the supreme court of the proper Territory, or if the case be in a United States court in a State, to the Supreme Court of the United States, which shall be taken and allowed in the manner now prescribed by law for taking appeals from said courts; which Supreme Court shall retry the cause, as well the issues or questions of fact as of law, and may hear testimony in addition to that given in the court below; and either party shall be allowed one year in which to appeal from the decision of the supreme court of such Territory or the district court in a State to the Supreme Court of the United States, in which court every question shall be open, and whose decision shall be final and conclusive; and should no appeal be taken, the judgment or the decree of the said district court shall in like manner be final and conclusive, as also the decision of the supreme court of the Territory unless appealed from.

SEC. 208. The testimony which has been heretofore lawfully and regularly received by the Surveyor-General of the proper Territory or State, or by the Commissioner of the General Land Office, upon all claims presented to them respectively, shall be admitted in evidence in all trials under this act when the person testifying is dead, so far as the subject-matter thereof is competent evidence; and the court shall give it such weight as, in its judgment, under all the circumstances, it ought to have.

SEC. 209. It shall be the duty of the Commissioner of the General Land Office of the United States, the Surveyor-Generals of such Territories and States, or the keeper of any public records who may have possession of the records and testimony pertaining to any land-grants or claims for land within said States and Territories, in relation to which any petition shall be brought under this act, on the application of any person interested, or by the attorney of the United States for either of said Territories or districts, to furnish copies of such records and testimony, certified under his official signature, with the seal of office thereto annexed, if there be a seal of office; which copies, if the originals are not within the jurisdiction of the court, shall have the same effect as testimony that the originals would have if produced. The legal fees shall be paid for such copies by the parties applying for the same, except the attorney of the United States.

SEC. 210. The provisions of this act shall extend only to such claims as may be presented and filed within three years from the date of its passage; and all petitions under this act may be presented in vacation or term-time, but the final hearing on the same shall be had and the final decree rendered only at the regular terms of the district courts; and the judges of said district courts and the supreme courts in the said Territories are hereby authorized, in vacation, in all cases arising under this act, to grant all orders for taking testimony, or otherwise to hear and dispose of all motions, and do all other things necessary to be done to bring the same on to a final hearing.

SEC. 211. Upon the final decision of any claim prosecuted under this act, in favor of the claimant or claimants, it shall be the duty of the

clerk of the court in which such final decree is had to transmit a duly certified copy of the decree to the Surveyor-General of the proper Territory, who shall thereupon cause the lands specified in said decree to be surveyed at the expense of the United States. Triplicate plats and certificates of the survey so made shall be returned into his office, one of which shall remain in his office, and one, duly authenticated, shall be delivered, on demand, to the party interested therein, and one shall be sent to the Commissioner of the General Land Office; on receipt and approval of which survey and plat by said Commissioner the President of the United States shall issue a patent to said claimant, subject to the provisions of this act; but one-half the necessary expense of making such survey and plat shall be paid by the claimant, and shall be a lien on said land, which may be enforced by sale of so much thereof as shall be necessary for that purpose, after a default of payment thereof for six months next after the approval of such survey and plat; and no patent shall issue until such payment.

SEC. 212. The clerk of the court in which such petition may be filed shall, and he is hereby directed, when any petition or claim is filed under the provisions of this act, before any proceedings thereon, subject to the direction of a judge, to require reasonable security for all costs and charges which may accrue thereon in prosecuting the same to a final decree; and the district attorney, clerk, marshal, and witnesses shall severally be allowed such fees for their services and attendance as may be allowed by law for the like services and attendance in the United States courts for the proper State or Territory.

SEC. 213. It shall be the duty of the attorney of the United States for the proper Territory, in every case when the decision or decree of the district court is against the United States, to appeal the cause to the supreme court of the Territory; and if the decision of the latte court be against the United States, a copy of the decree, with a state ment of the leg al questions involved, shall be transmitted by the distric attorney to the Attorney-General; and in like manner he shall transmit a copy of the decree in any case in the district court in a State, and, unless the Attorney-General shall otherwise direct, the district attorney shall appeal the cause to the Supreme Court of the United States.

SEC. 214. If in any case it shall so happen that the lands decreed to any claimant under the provisions of this act shall have been sold or granted for a valuable consideration by the United States, it shall be lawful for such claimants, or their legal representatives, at any time within one year after the rendition of the final decree in their favor, to execute and file, in the office of the Commissioner of the General Land Office, a release to the United States of all right, title, or claim to the land so sold or granted by the United States; and thereupon there shall be issued by the said Commissioner (under such regulations as may be prescribed by the Secretary of the Interior), to such claimant or his legal representatives, scrip for an equal amount of acres so released in quantities not exceeding six hundred and forty acres each, which scrip shall be assignable in such form as may be prescribed by said Secretary, and shall be receivable in payment for any public lands in either of said Territories or States respectively that may be subject to private entry.

SEC. 215. The provisions of this act shall extend to any city lot, town lot, village lot, farm lot, or pasture lot held under a grant from any corporation or town to which lands may have been lawfully granted for the establishment of a city, town, or village by the Spanish or Mexican Government, or the lawful authorities thereof; but the claim for said

city, town, or village shall be presented by the corporate authorities of the said city, town, or village, or, where the land upon which said city, town, or village is situated was originally granted to an individual, the claim shall be presented by or in the name of said individual.

SEC. 216. All claims which are capable of being prosecuted under the provisions of this act shall, after three years from the taking effect of this act, if no petition in respect to the same shall have been filed as hereinbefore provided, be deemed and taken, in all courts and elsewhere, to be abandoned, and shall be forever barred.

SEC. 217. All the foregoing proceedings and rights shall be conducted and decided, subject to the following provisions, as well as to the other provisions of this act, namely:

First. No claim shall be allowed that shall not appear to be upon a title lawfully and regularly derived from the Government of Spain or Mexico, or, if incomplete, one that at the date of the acquisition of the territory by the United States the claimant would have had a lawful right to make perfect, had the territory not been acquired by the United States, and that the United States are bound upon the principles of public law, or by the provisions of the treaty of cession, to respect and permit to become complete and perfect.

Second. No claim shall be allowed that shall interfere with or overthrow any just and unextinguished Indian title or right to any land or place.

Third. No allowance or confirmation of any claim shall confer any right or title to any gold, silver, or quicksilver mines or minerals, unless the grant claimed effected the donation or sale of such mines or minerals to the grantee; but all such mines and minerals shall remain the property of the United States, with the right of working the same, which fact shall be stated in any patents issued under this act.

Fourth. No claim shall be allowed for any land the right to which has hitherto been lawfully acted upon and decided by Congress, or under its authority.

Fifth. No proceeding, decree, or act under this chapter shall conclude or affect the private rights of persons as between each other; all which rights shall be reserved and saved to the same effect as if this act had not been passed; but the proceedings, decrees, and acts herein provided for shall be conclusive of all rights as between the United States and all persons claiming any interest or right in such lands.

Sixth. No confirmation of or decree concerning any claim under this chapter shall in any manner operate or have effect against the United States otherwise than as a release by the United States of its right and title to the land confirmed; nor shall it operate to make the United States in any manner liable in respect of any such grants, claims, or lands, or their disposition, otherwise than as herein provided.

Seventh. No confirmation shall in any case be made or patent issued for a greater quantity than eleven square leagues of land, to or in the right of any one original grantee or claimant, nor for a greater quantity than was authorized by the respective laws of Spain or Mexico applicable to the claim.

SEC. 218. Section eight of the act of Congress approved July twenty-second, anno Domini eighteen hundred and fifty-four, entitled "An act to establish the offices of surveyor-general of New Mexico, Kansas, and Nebraska, to grant donations to actual settlers therein, and for other purposes," and all acts amendatory or in extension thereof, or supplementary thereto, and all provisions of law inconsistent with this chapter shall be, and the same are hereby, repealed.

SEC. 219. In case of any claim to land in any State or Territory which has heretofore been confirmed by law, and in which no provision is made by the confirmatory statute for the issue of a patent, it may be lawful, where surveys for the land have been or may hereafter be made, to issue patents for the claims so confirmed, upon the presentation to the Commissioner of the General Land Office of plats of survey thereof, duly approved by the Surveyor General of any State or Territory, if the same be found correct by the Commissioner; but such patents shall only operate as a relinquishment of title on the part of the United States, and shall in no manner interfere with any valid adverse right to the same land, nor be construed to preclude a legal investigation and decision by the proper judicial tribunal between adverse claimants to the same land.

SEC. 220. Where persons in good faith and for a valuable consideration have purchased lands of Mexican grantees, or assigns, which grants have subsequently been rejected, or where the lands so purchased have been excluded from the final survey of any Mexican Grant, and have used, improved, and continued in the actual possession of the same as according to the lines of their original purchase, such purchasers shall have the right to purchase the same, after having such lands surveyed under existing laws, at one dollar and twenty-five cents per acre, upon making proof of the facts as required in this section, under regulations to be provided by the Commissioner of the General Land Office, joint entries being admissible by coterminous proprietors to such an extent as will enable them to adjust their respective boundaries: *Provided*, That the provisions of this section shall not be applicable to any city or town, nor shall the right to purchase herein given extend to lands containing mines of gold, silver, copper, or cinnabar.

SEC. 221. In all cases of confirmation by the first section of the act of Congress approved June second, eighteen hundred and fifty-eight, entitled "An act to provide for the location of certain confirmed private land-claims in the State of Missouri, and for other purposes," and in all cases of final decisions in favor of land claimants made by the commissioners under section four of the act of Congress approved March third, eighteen hundred and seven, entitled "An act respecting claims to land in the Territories of Orleans and Louisiana," or where any private land claim had been confirmed by Congress before June second, eighteen hundred and fifty-eight, and the same, in whole or in part, had not been located or satisfied, either for want of a specific location prior to such confirmation, or for any reason whatsoever, other than a discovery of fraud in such claim subsequent to such confirmation, the confirmees, or their heirs or legal representatives, may proceed by petition against the United States for certificates of location for a quantity of land equal to that so confirmed and unsatisfied, in any district court of the United States within whose jurisdiction any part of such claim may lie; and the petition shall be verified by the oath of the petitioners, and conform to the practice of the courts in cases arising under the act of Congress approved June twenty-second, eighteen hundred and sixty, entitled "An act for the final adjustment of private land claims in the States of Florida, Louisiana, and Missouri, and for other purposes," and the acts reviving or amending said act; and the attorney of the United States for such district shall defend against the same for the United States; and the case shall be adjudged as equity and justice may require, and if it shall appear to the court, upon satisfactory proof, that such claim has been so confirmed, and that the same, in whole or in part, remains unsatisfied, the court shall decree accordingly and order certificates of location

to be issued to the petitioners in the manner provided by an act of Congress approved January twenty-eighth, eighteen hundred and seventy-nine, entitled "An act defining the manner in which certain land-scrip may be assigned and located, or applied by actual settlers, and providing for the issue of patents in the name of the locator or his legal representatives, which certificates shall be divisible, assignable, locatable, and patentable according to the provisions of said act of January twenty-eighth, eighteen hundred and seventy-nine.

SEC. 222. The decree so rendered, whether for or against the United States, shall be final, unless the area or aggregate of the certificates of location claimed in the petition shall exceed, at a valuation of a dollar and a quarter an acre, the sum of five thousand dollars, in which case, if the decree be against the United States, an appeal may be entered to the Supreme Court of the United States, and if it be against the petitioners, they may take an appeal directly to that court, as of right and course, without affidavit or security other than for costs; and the appeal shall be adjudged de novo in the Supreme Court, as in other cases of appeals thereto in chancery, and as the principles of this act may require; and the decision of the Supreme Court shall be final.

SEC. 223. So much of the act of Congress approved June second, eighteen hundred and fifty-eight, chapter eighty-one, or of any other act of Congress, as authorizes executive officers of the United States, in their judgment and discretion, to allow indemnity locations, floats, scrip, or certificates of location, on behalf of confirmed private land-claims which come within the purview of this act, be, and the same is hereby, repealed.

CHAPTER XIV.

STATE SELECTIONS.

SEC. 224. The several grants of public lands heretofore made to the several States shall be adjusted in accordance with the laws of Congress now in force; but the States which may hereafter be admitted into the Union shall be entitled only to such grants of lands as may be specifically provided for in their several enabling acts.

SEC. 225. The lands appropriated by section one hundred and ten shall be selected within the same land district, in accordance with the following principles of adjustment, to wit: For each township or fractional township containing a greater quantity of land than three-quarters of an entire township, one section; for a fractional township containing a greater quantity of land than one-half and not more than three-quarters of a township, three-quarters of a section; for a fractional township containing a greater quantity of land than one-quarter and not more than one-half of a township, one-half section; and for a fractional township containing a greater quantity of land than one entire section and not more than one-quarter of a township, one-quarter section of land.

SEC. 226. It shall be the duty of the Commissioner of the General Land Office to cause patents conveying the legal title to be issued to the several States for all lands, not heretofore certified under existing laws and regulations, which have been or may hereafter be granted to them for any purpose whatever: *Provided*, That where grants of lands have been made to a State for a specific purpose, and such State shall have transferred its interest in the lands to any corporation or individual, patents shall be issued to such corporation or individual on compli-

ance with the terms and conditions of the granting act; but nothing herein contained shall be construed to revive or continue the provisions of any grant beyond the period fixed by law: *Provided*, That where lands have been heretofore certified without authority of law, or in excess of the grant, the Commissioner of the General Land Office shall treat such certifications as absolutely null and void, and shall dispose of the lands covered thereby under the public land laws applicable thereto in the same manner and to the same extent as if no such unlawful or excessive certifications had been made, but innocent purchasers under color of title from such illegal certifications shall, in the absence of valid adverse right, have a preference right to purchase from the United States at one dollar and twenty-five cents per acre.

CHAPTER XV.

BOUNTY LANDS.

SEC. 227. All warrants for military bounty-lands which have been or may hereafter be issued under any law of the United States, and all valid locations of the same which have been or may hereafter be made, are declared to be assignable by deed or instrument of writing, made and executed according to such form and pursuant to such regulations as may be prescribed by the Commissioner of the General Land Office, so as to vest the assignee with all the rights of the original owner of the warrant or location.

SEC. 228. The warrants which have been or may hereafter be issued in pursuance of law may be located according to the legal subdivisions of the public lands in one body upon any lands of the United States subject to private entry at the time of such location at the minimum price. When such warrant is located on lands which are subject to entry at a greater minimum than one dollar and twenty-five cents per acre, the locator shall pay to the United States in cash the difference between the value of such warrants at one dollar and twenty-five cents per acre and the tract of land located on. But where such tract is rated at one dollar and twenty-five cents per acre, and does not exceed the area specified in the warrant, it must be taken in full satisfaction thereof.

SEC. 229. In all cases of warrants for bounty-lands, issued by virtue of an act approved July twenty-seven, one thousand eight hundred and forty-two, and of two acts approved January twenty-seven, one thousand eight hundred and thirty-five, therein and thereby revised, and of two acts to the same intent, respectively, approved June twenty-six, eighteen hundred and forty-eight, and February eight, eighteen hundred and fifty-four, for military services in the revolutionary war, or in the war of eighteen hundred and twelve with Great Britain, which remained unsatisfied on the second day of July, eighteen hundred and sixty-four, it is lawful for the person in whose name such warrant issued, his heirs or legal representatives, to enter in quarter sections, at the proper local land office in any of the States or Territories, the quantity of the public lands subject to private entry which he is entitled to under such warrant.

SEC. 230. All warrants for bounty-lands referred to in the preceding section may be located at any time in conformity with the general laws in force at the time of such location.

SEC. 231. Each of the surviving, or the widow or minor children of

deceased, commissioned and non-commissioned officers, musicians, or privates, whether of regulars, volunteers, rangers, or militia, who performed military service in any regiment, company, or detachment, in the service of the United States, in the war with Great Britain, declared on the eighteenth day of June, eighteen hundred and twelve, or in any of the Indian wars since seventeen hundred and ninety, and prior to the third of March, eighteen hundred and fifty, and each of the commissioned officers who was engaged in the military service of the United States in the war with Mexico, shall be entitled to lands as follows: Those who engaged to serve twelve months or during the war, and actually served nine months, shall receive one hundred and sixty acres, and those who engaged to serve six months, and actually served four months, shall receive eighty acres, and those who engaged to serve for any or an indefinite period, and actually served one month, shall receive forty acres; but wherever any officer or soldier was honorably discharged, in consequence of disability contracted in the service, before the expiration of his period of service, he shall receive the amount to which he would have been entitled if he had served the full period for which he had engaged to serve. All the persons enumerated in this section who enlisted in the regular army, or were mustered in any volunteer company for a period of not less than twelve months, and who served in the war with Mexico and received an honorable discharge, or who were killed or died of wounds received or sickness incurred in the course of such service, or were discharged before the expiration of the term of service in consequence of wounds received or sickness incurred in the course of such service, shall be entitled to receive a certificate or warrant for one hundred and sixty acres of land: or at option Treasury scrip for one hundred dollars bearing interest at six per cent. per annum, payable semi-annually, at the pleasure of the Government. In the event of the death of any one of the persons mentioned in this section during service, or after his discharge, and before the issuing of a certificate or warrant, the warrant or scrip shall be issued in favor of his family or relatives; first, to the widow and his children; second, his father; third, his mother; fourth, his brothers and sisters.

SEC. 232. The persons enumerated in the preceding section received into service after the commencement of the war with Mexico, for less than twelve months, and who served such term, or were honorably discharged are entitled to receive a certificate or warrant for forty acres, or scrip for twenty-five dollars if preferred, and in the event of the death of such person during service, or after honorable discharge before the eleventh of February, eighteen hundred and forty-seven, the warrant or scrip shall issue to the wife, child, or children, if there be any, and if none, to the father, and if no father, to the mother of such soldier.

SEC. 233. Where the militia, or volunteers, or State troops of any State or Territory, subsequent to the eigteenth day of June, eighteen hundred and twelve, and prior to March twenty-second, eighteen hundred and fifty-two, were called into service, the officers and soldiers thereof shall be entitled to all the benefits of section two thousand four hundred and eighteen of the Revised Statutes of the United States upon proof of length of service as therein required.

SEC. 234. No person shall take any benefit under the provisions of the three preceding sections, if he has received, or is entitled to receive, any military land-bounty under any act of Congress passed prior to the twenty-second March, eighteen hundred and fifty-two.

SEC. 235. The period during which any officer or soldier remained in captivity with the enemy shall be estimated and added to the period of

his actual service, and the person so retained in captivity shall receive land under the provisions of sections twenty-four hundred and eighteen and twenty-four hundred and twenty of the Revised Statutes of the United States, in the same manner that he would be entitled in case he had entered the service for the whole term made up by the addition of the time of his captivity, and had served during such term.

SEC. 236. Every person for whom provision is made by sections twenty-four hundred and eighteen and twenty-four hundred and twenty of the Revised Statutes of the United States shall receive a warrant from the Department of the Interior for the quantity of land to which he is entitled; and, upon the return of such warrant, with evidence of the location thereof having been legally made to the General Land-Office, a patent shall be issued therefor.

SEC. 237. In the event of the death of any person, for whom provision is made by said sections twenty-four hundred and eighteen and twenty-four hundred and twenty, and who did not receive bounty-land for his services, a like warrant shall issue in favor of his widow, who shall be entitled to one hundred and sixty acres of land in case her husband was killed in battle; nor shall a subsequent marriage impair the right of any widow to such warrant, if she be a widow at the time of making her application.

SEC. 238. Each of the surviving persons specified in the classes enumerated in the following section, who has served for a period of not less than fourteen days, in any of the wars in which the United States have been engaged since the year seventeen hundred and ninety, and prior to the third day of March, eighteen hundred and fifty-five, shall be entitled to receive a warrant from the Department of the Interior for one hundred and sixty acres of land; and, where any person so entitled has, prior to the third day of March, eighteen hundred and fifty-five, received a warrant for any number of acres less than one hundred and sixty, he shall be allowed a warrant for such quantity of land only as will make in the whole, with what he may have received prior to that date, one hundred and sixty acres.

SEC. 239. The classes of persons embraced as beneficiaries under the preceding section, are as follows, namely:

First. Commissioned and non-commissioned officers, musicians, and privates, whether of the regulars, volunteers, rangers, or militia, who were regularly mustered into the service of the United States.

Second. Commissioned and non-commissioned officers, seamen, ordinary seamen, flotilla-men, marines, clerks, and landsmen in the Navy.

Third. Militia, volunteers, and State troops of any State or Territory, called into military service, and regularly mustered therein, and whose services have been paid by the United States.

Fourth. Wagon-masters and teamsters who have been employed under the direction of competent authority, in time of war, in the transportation of military stores and supplies.

Fifth. Officers and soldiers of the revolutionary war, and marines, seamen, and other persons in the naval service of the United States during that war.

Sixth. Chaplains who served with the Army.

Seventh. Volunteers who served with the armed forces of the United States in any of the wars mentioned, subject to military orders, whether regularly mustered into the service of the United States or not.

SEC. 240. The following class of persons are included as beneficiaries under section twenty-four hundred and twenty-five of the Revised Stat-

utes of the United States, without regard tothe length of service rendered.

First. Any of the classes of persons mentioned in the preceding section who have been actually engaged in any battle in any of the wars in which this country has been engaged since seventeen hundred and ninety, and prior to March third, eighteen hundred and fifty-five.

Second. Those volunteers who served at the invasion of Plattsburgh, in September, eighteen hundred and fourteen.

Third. The volunteers who served at the battle of King's Mountain, in the revolutionary war.

Fourth. The volunteers who served at the battle of Nickojack against the confederate savages of the south.

Fifth. The volunteers who served at the attack on Lewistown, in Delaware, by the British fleet, in the war of eighteen hundred and twelve.

SEC. 241. In the event of the death of any person who would be entitled to a warrant, as provided in section twenty-four hundred and twenty-five of the Revised Statutes of the United States, leaving a widow, or, if no widow, a minor child, such widow or such minor child shall receive a warrant for the same quantity of land that the decedent would be entitled to receive, if living on the third day of March, eighteen hundred and fifty-five.

SEC. 242. A subsequent marriage shall not impair the right of any widow, under the preceding section, if she be a widow at the time of her application.

SEC. 243. Persons within the age of twenty-one years on the third day of March, eighteen hundred and fifty-five, shall be considered minors within the intent of section twenty-four hundred and twenty-eight of the Revised Statutes of the United States.

SEC. 244. Where no record evidence of the service for which a warrant is claimed exists, parol evidence may be admitted to prove the service performed, under such regulations as the Commissioner of Pensions may prescribe.

SEC. 245. Where certificate or a warrant for bounty-land for any less quantity than one hundred and sixty acres has been issued to any officer or soldier, or to the widow or minor child of any officer or soldier, the evidence upon which such certificate or warrant was issued shall be received to establish the service of such officer or soldier in the application of himself, or of his widow or minor child, for a warrant for so much land as may be required to make up the full sum of one hundred and sixty acres, to which he may be entitled under the preceding section, on proof of the identity of such officer or soldier, or, in case of his death, of the marriage and identity of his widow, or, in case of her death, of the identity of his minor child. But if, upon a review of such evidence, the Commissioner of Pensions is not satisfied that the former warrant was properly granted, he may require additional evidence, as well of the term as of the fact of service.

SEC. 246. When any company, battalion, or regiment, in an organized form, marched more than twenty miles to the place where they were mustered into the service of the United States, or were discharged more than twenty miles from the place where such company, battalion, or regiment was organized, in all such cases, in computing the length of service of the officers and soldiers of any such company, battalion, or regiment, there shall be allowed one day for every twenty miles from the place where the company, battalion, or regiment was organized, to the place where the same was mustered into the service of the United

States, and one day for every twenty miles from the place where such company, battalion, or regiment was discharged, to the place where it was organized, and from whence it marched to enter the service, provided that such march was in obedience to the command or direction of the President, or some general officer of the United States, commanding an army or department, or the chief executive officer of the State or Territory by which such company, battalion, or regiment was called into service.

SEC. 247. The provisions of all the bounty-land laws shall be extended to Indians, in the same manner and to the same extent as to white persons.

SEC. 248. Where a pension has been granted to any officer or soldier, the evidence upon which such pension was granted shall be received to establish the service of such officer or soldier in his application for bounty-land; and upon proof of his identity as such pensioner, a warrant may be issued to him for the quantity of land to which he is entitled; and in case of the death of such pensioned officer or soldier, his widow shall be entitled to a warrant for the same quantity of land to which her husband would have been entitled, if living, upon proof that she is such widow; and in case of the death of such officer or soldier, leaving a minor child and no widow, or where the widow may have deceased before the issuing of any warrant, such minor child shall be entitled to a warrant for the same quantity of land as the father would have been entitled to receive if living, upon proof of the decease of father and mother. But if, upon a review of such evidence, the Commissioner of Pensions is not satisfied that the pension was properly granted, he may require additional evidence as well of the term as of the fact of service.

SEC. 249. All sales, mortgages, letters of attorney, or other instruments of writing, going to affect the title or claim to any warrant issued, or to be issued, or any land granted, or to be granted, under the preceding provisions of this chapter, made or executed prior to the issue of such warrant, shall be null and void to all intents and purposes whatsoever; nor shall such warrant, or the land obtained thereby, be in any wise affected by, or charged with, or subject to, the payment of any debt or claim incurred by any officer or soldier, prior to the issuing of the patent.

SEC. 250. It shall be the duty of the Commissioner of the General Land Office, under such regulations as may be prescribed by the Secretary of the Interior, to cause to be located, free of expense, any warrant which the holder may transmit to the General Land Office for that purpose, in such State or land district as the holder or warrantee may designate, and upon good farming land, so far as the same can be ascertained from the maps, plats, and field-notes of the surveyor, or from any other information in the possession of the local office, and, upon the location being made, the Secretary shall cause a patent to be transmitted to such warrantee or holder.

SEC. 251. No person who has been in the military service of the United States shall, in any case, receive a bounty-land warrant if it appears by the muster-rolls of his regiment or corps that he deserted or was dishonorably discharged from service.

SEC. 252. When a soldier of the Regular Army, who has obtained a military land-warrant, loses the same, or such warrant is destroyed by accident, he shall, upon proof thereof to the satisfaction of the Secretary of the Interior, be entitled to a patent in like manner as if the warrant was produced.

SEC. 253. In all cases of discharge from the military service of the United States of any soldier of the Regular Army, when it appears to the satisfaction of the Secretary of War that a certificate of faithful services has been omitted by the neglect of the discharging officer, by misconstruction of the law, or by any other neglect or casualty, such omission shall not prevent the issuing of the warrant and patent as in other cases. And when it is proved that any soldier of the Regular Army has lost his discharge and certificate of faithful service, the Secretary of War shall cause such papers to be furnished such soldier as will entitle him to his land-warrant and patent, provided such measure is justified by the time of his enlistment, the period of service, and the report of some officer of the corps to which he was attached.

SEC. 254. Whenever it appears that any certificate or warrant, issued in pursuance of any law granting bounty-land, has been lost or destroyed, whether the same has been sold and assigned by the warrantee or not, the Secretary of the Interior is required to cause a new certificate or warrant of like tenor to be issued in lieu thereof; which new certificate or warrant may be assigned, located, and patented in like manner as other certificates or warrants for bounty-land are now authorized by law to be assigned, located, and patented; and in all cases where warrants have been, or may be, re-issued, the original warrant, in whose-ever hands it may be, shall be deemed and held to be null and void, and the assignment thereof, if any there be, fraudulent; and no patent shall ever issue for any land located therewith, unless such presumption of fraud in the assignment be removed by due proof that the same was executed by the warrantee in good faith and for a valuable consideration.

SEC. 255. The Secretary of the Interior is required to prescribe such regulations for carrying the preceding section into effect as he may deem necessary and proper in order to protect the government against imposition and fraud by persons claiming the benefit thereof; and all laws and parts of laws for the punishment of frauds against the United States are made applicable to frauds under that section.

SEC. 256. In all cases where an officer or soldier of the revolutionary war, or a soldier of the war of eighteen hundred and twelve, was entitled to bounty-land, has died before obtaining a patent for the land, and where application is made by a part only of the heirs of such deceased officer or soldier for such bounty-land, it shall be the duty of the Secretary of the Interior to issue the patent in the name of the heirs of such deceased officer or soldier, without specifying each; and the patent so issued in the name of the heirs, generally, shall inure to the benefit of the whole, in such portions as they are severally entitled to by the laws of descent in the State or Territory where the officer or soldier belonged at the time of his death.

SEC. 257. When proof has been or hereafter is filed in the Pension-Office, during the life-time of a claimant, establishing, to the satisfaction of that office, his right to a warrant for military services, and such warrant has not been, or may not be, issued until after the death of the claimant, and all such warrants as have been heretofore issued subsequent to the death of the claimant, the title to such warrants shall vest in his widow, if there be one, and if there be no widow, then in the heirs or legatees of the claimant; and all military bounty-land warrants issued pursuant to law shall be treated as personal chattels, and may be conveyed by assignment of such widow, heirs, or legatees, or by the legal representatives of the deceased claimant, for the use of such heirs or legatees only.

SEC. 258. The legal representatives of a deceased claimant for a bounty-land warrant, whose claim was filed prior to his death, may file the proofs necessary to perfect such claim.

SEC. 259. Where an actual settler on the public lands has sought, or hereafter attempts, to locate the land settled on and improved by him, with a military bounty-land warrant, and where, from any cause, an error has occurred in making such location, he is authorized to relinquish the land so erroneously located, and to locate such warrants upon the land so settled upon and improved by him, if the same then be vacant, and if not, upon any other vacant land, on making proof of those facts to the satisfaction of the land-officers, according to such rules and regulations as may be prescribed by the Commissioner of the General Land Office, and subject to his final adjudication.

CHAPTER XVI.

MISCELLANEOUS PROVISIONS.

SEC. 260. The Secretary of the Interior is authorized to permit the purchase, with cash or military bounty-land warrants, of such lands as may have been located with claims arising under the seventh clause of the second article of the treaty of September thirty, eighteen hundred and fifty-four, at such price per acre as he deems equitable and proper, but not at a less price than one dollar and twenty-five cents per acre; and the owners and holders of such claims in good faith are also permitted to complete their entries and to perfect their titles under such claims upon compliance with the terms above mentioned; but it must be shown to the satisfaction of the Secretary of the Interior that such claims are held by innocent parties in good faith, and that the locations made under such claims have been made in good faith and by innocent holders of the same.

SEC. 261. In all cases in which land has heretofore or shall hereafter be given by the United States for military services, warrants shall be granted to the parties entitled to such land by the Secretary of the Interior; and such warrants shall be recorded in the General Land Office in books to be kept for the purpose, and shall be located as is, or may be, provided by law, and patents shall afterwards be issued accordingly.

SEC. 262. The gold coins of Great Britain and other foreign coins shall be received in all payments on account of public lands, at the value estimated annually by the Director of the Mint, and proclaimed by the Secretary of the Treasury, in accordance with the provisions of section thirty-five hundred and sixty-four of the Revised Statutes of the United States, title "The Coinage."

SEC. 263. In all cases of an application, entry or location hereafter made, of a tract of land not intended to be applied for, entered or located, by a mistake of the true numbers of the tract intended to be applied for, entered or located, where the certificate of the original applicant, purchaser or locator has not been assigned, or his right in any way transferred, the said applicant, purchaser or locator, or, in case of his death, the legal representatives, not being assignees or transferees, may file his or their affidavit, with such additional evidence as can be procured, showing the mistake of the numbers of the tract intended to be applied for, entered or located, and that every reasonable precaution

and exertion had been used to avoid the error, with the Register of the land district within which such tract of land is situated, who shall transmit the evidence, together with his written opinion to the Commissioner of the General Land Office; and if the said Commissioner shall be entirely satisfied that the mistake has been made, and that every reasonable precaution and exertion had been made to avoid it, he is authorized to change the application, entry or location, and to transfer any payment made to that intended to be applied for, entered or located, if unsold; but, if sold, to any other tract liable to similar application, entry or location; but nothing herein contained shall affect the right of third persons.

SEC. 264. The provisions of the preceding section shall extend to all cases where patents may hereafter issue, but upon condition, however, that the party concerned surrenders his patent to the Commissioner of the General Land Office, with a relinquishment of title thereon, executed in a form to be prescribed by the Secretary of the Interior; and upon like surrender of any patent, with similar relinquishment of unincumbered title, the Commissioner of the General Land Office is authorized to reissue said patent, when necessary or proper to correct any error in description, or in names of parties, or in other material particular.

SEC. 265. Whenever any reservation of public lands is released by proper authority, said lands shall thereafter be subject to disposition, under the same laws and conditions, as other public lands of like classification, but at a price to be fixed by the Commissioner of the General Land Office.

SEC. 266. When, from any cause whatsoever, the United States hereafter refuse to issue patent, or other final evidence of title, to an applicant for any tract of public land, the Secretary of the Interior is authorized to repay to the applicant, or his legal representatives, the sum of money which was paid therefor, or in connection therewith, whether by way of fees, costs, or purchase money, out of any money in the Treasury not otherwise appropriated; and the Secretary is similarly authorized to repay excess payments which may have been, or shall be, illegally exacted. The appropriation herein provided for shall be deemed a permanent specific appropriation.

SEC. 267. Where the moneys, derived from the payments mentioned in the preceding section, have been invested in any stocks held in trust, or have been paid into the Treasury to the credit of any trust fund, it shall be lawful, by the sale of such portion of such stocks, as may be necessary for the purpose, or out of such trust fund, to repay the purchase money to the parties entitled thereto.

SEC. 268. Whenever proof shall be made, to the satisfaction of the Secretary of the Interior, that innocent parties have paid the fees or commissions, or excess payments, required upon the location of claims under section 2306 of the Revised Statutes of the United States, which said claims were, after such location, proved to be fraudulent and void, and the entries or locations made thereon canceled, the Secretary of the Interior is authorized to repay to such innocent parties the fees, or commissions, or excess payments paid by them, out of any money in the Treasury not otherwise appropriated.

SEC. 269. Where any actual settler shall have paid the double minimum rate for any lands on account of said land being, at the time of payment, within the granted or indemnity limits of a railroad grant, or the withdrawal for the same, and the location for the line of the road is subsequently changed, so that such lands are thrown outside of said limits, or it is discovered, by adjustment of the withdrawal, that such

lands are not within said limits, or said railroad grant shall be forfeited to the United States, and restored to the public domain, for failure to build such railroad, the Secretary of the Interior is authorized to repay to such actual settlers the sums paid by them in excess of the single minimum rate for public lands.

SEC. 270. Where patents for public lands have been or may be issued, in pursuance of any law of the United States, to a person who had died, or who hereafter dies, before the date of such patent, the title to the land designated therein shall inure to and become vested in the heirs, devisees, or assignees of such deceased patentee, as if the patent had issued to the deceased person during life.

SEC. 271. All scrip heretofore issued in pursuance of laws and receivable in payment of pre-emption or commuted homestead entries, may hereafter be located by the holders thereof, upon any public lands of the United States subject to entry under the homestead, irrigation, or pasturage laws: *Provided*, That said location shall be made within two years from the passage of this act.

SEC. 272. Where a party in possession of any part of the public lands of the United States fails, refuses, or omits to protect or evidence his right of possession, as required by the laws of the United States, and who has no claim of title under acts of Congress or treaty stipulation, the said land shall be deemed vacant public lands, and as such subject to the occupation and claim of any other person seeking to acquire title under any of the public land laws.

SEC. 273. It shall be the duty of the Commissioner of the General Land Office to take the requisite measures to ascertain all cases properly falling within the act of March 3, 1807, entited "An act to prevent settlements being made on lands ceded to the United States until authorized by law," which act is hereby made part of this section, and he shall cause the same to be enforced in favor of parties seeking to acquire title under the public land laws.

SEC. 274. All navigable rivers, within the territory occupied by the public lands, shall remain and be deemed public highways; and in all cases where the opposite banks of any streams not navigable belong to different persons, the stream and the bed thereof shall become common to both.

SEC. 275. The right of way for the construction of highways over public lands, not reserved for public uses, is hereby granted; and all patents for public lands hereafter sold or granted by the United States shall contain a clause, reserving to the public an easement for highways.

SEC. 276. Where the United States have heretofore granted a special right of way over the public lands to any railroad company, and the same has not been fixed by actual location upon the earth's surface, together with *bona fide* occupation of the line located, the same shall hereafter be subject to all the conditions, limitations, and restrictions of the act entitled "An act granting to railroads the right of way through the public lands of the United States," approved March 3, 1875; or if said special right of way has been heretofore fixed by location and occupation only in part, the unlocated and unoccupied part shall hereafter be subject as above prescribed.

SEC. 277. When a land grant to any railroad company falls in whole or in part upon lands classified as irrigable or pasturage lands, the Secretary of the Interior is hereby authorized upon the application of said railroad company, and when in his judgment the public interests will be subserved thereby, to exchange alternate reserved sections of the public lands for sections granted to said railroads so as to consolidate the re-

spective ownerships of the United States and of the company in separate blocks of not less than four contiguous sections each, and he is authorized to cause the requisite patents to be executed: *Provided*, That said railroad company shall first file with him the proper conveyances to the United States of the granted sections intended to be exchanged, with satisfactory proof that the title thereto is free and unincumbered in said company.

SEC. 278. The Commissioner of the General Land Office, under the directions of the Secretary of the Interior, is authorized to enforce and carry into execution, by appropriate regulations, every part of the provisions of this title not otherwise specially provided for.

CHAPTER XVII.

REPEAL PROVISIONS.

SEC. 279. The foregoing sixteen chapters embrace the statutes of the United States, general and permanent in their nature, and applicable to the survey and sale of the public lands in force on the day of , A. D. .

SEC. 280. All acts of Congress passed prior to said A. D. , any portion of which is embraced in any section of the foregoing laws, are hereby repealed, and the section applicable thereto shall be in force in lieu thereof; all parts of such acts not contained in the foregoing laws, having been repealed or superseded by subsequent acts or not being general and permanent in their nature: *Provided*, That the incorporation into the foregoing laws of any general and permanent provision, taken from an act making appropriations or from an act containing other provisions of a private, local, or temporary character shall not repeal or in any way affect any appropriation, or any provision of a private, local, or temporary character, contained in any of said acts, but the same shall remain in force; and all acts of Congress passed prior to said last named day, no part of which are embraced in the foregoing laws, shall not be affected or changed by its enactment.

SEC. 281. The repeal of the several acts embraced in the foregoing laws shall not affect any act done, or any right accruing or accrued before said repeal.

SEC. 282. The arrangement and classification of the several sections of the foregoing laws have been made for the purpose of a more convenient and orderly arrangement of the same, and therefore no inference or presumption of a legislative construction is to be drawn by reason of the chapter under which any particular section is placed; nor shall any part of this act be construed to affect the term of service of present officers, excepting those herein specifically abolished.

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LETTERS AND TESTIMONY

TAKEN BY

THE PUBLIC LANDS COMMISSION.

Testimony of John Wasson, United States surveyor-general, Tucson, Ariz., relative to agricultural and timber lands and lode claims.

The questions to which the following answers are given will be found on sheet facing page 1.

UNITED STATES SURVEYOR-GENERAL'S OFFICE,
Tucson, Ariz., September 30, 1879.

To the Public Land Commission, Box 585, Washington, D. C.:

GENTLEMEN: Your circular, accompanied by a citation of the law under which you are acting and followed by numerous interrogatories, has been received, as has also a package for distribution, and the request complied with.

As I am quite sure the Commission will be troubled with too many replies and suggestions rather than with too few, I will confine my observations to a small number of your queries. Beginning with your first series of ten, I have to say, viz:

1. John Wasson, Tucson, Ariz., surveyor-general.

2. Nine and one-half years.

3. Not under any law of the United States, except mere possessory rights to mining claims.

4. Over eight years' experience as United States surveyor-general.

6. As a partial answer to this enticing question, I will say that the "desert land act" should be absolutely repealed and no attempt made to amend it. The law is a positive damage to nearly every one who attempts to acquire land under it in a practical and honest way. In most instances it simply operates to get twenty-five cents per acre from poor men for nothing, and tends to bring land legislation into contempt among those most in need of public encouragement, because practical settlers and cultivators.

7. Narrow and rich valleys, with streams of more or less volume; mesa or table land, mostly covered with grasses, upon which cattle and other stock fatten at all seasons, with considerable inferior timber useful for fuel, and some springs and small streams, but upon which reliance for water is in wells; mountain land containing minerals of nearly all kinds known to the commerce of the world, notably silver and gold, copper and lead, and iron, all in practically unlimited quantities, and timber valuable for all purposes required in mining, agriculture, and building in general, and mostly covered with rich grasses. The mountain and some of the mesa lands are cut by deep cañons, and considerable areas of the mountains are precipitous and rocky, with little vegetation of any kind.

8. As I understand this, it will be practically treated in next.

9. Would continue present system of surveys, into sections, of all rich bottom or valley lands, and sell in one-hundred-and-sixty-acre tracts at present price; would survey mesa or table land into *whole* townships, making corners of such solidity and with such bearing that they would be easily found a century hence, and then sell the land in quarter, half, and whole townships at a *nominal* price, with reasonable and practicable conditions concerning actual occupation, improvement, development of water, &c., compelling undoubted proof of strict compliance. At present, under existing legislation, the poor cannot properly turn this land to any considerable account, and the rich will not. Not one quarter section in one hundred is *alone* of any value to anybody, and it is hardly possible more ever will be, under present laws. It is absurd to hold these lands for occupation under the homestead or pre-emption acts, or for "homes for the homeless" or "lands for the landless," in the demagogic sense these expressions seem to have been used. The land bearing timber of commercial value I would survey into sections, sell in *quarter* sections, without conditions, after due public notice, at public auction, to the highest bidder, and thereby induce the purchasers to protect the timber from wastage and perhaps lead many to protect and even cultivate the young growth.

Actual observation of government protection of timber by the efforts of special agents leads me to these clear conclusions, viz: That in too many instances these agents boldly extort money or do not resist the temptations to be bribed, to the mani-

QUESTIONS SUBMITTED BY THE PUBLIC LAND COMMISSION.

1. What is your name, residence, and occupation?
2. How long have you lived in the county, State, or Territory, in which you reside?
3. Have you acquired, or sought to acquire, title to any of the public lands of the United States; and, if so, how or under what laws?
4. What additional means or opportunities have you had to learn the practical workings of the public-land laws?
5. From your personal experience, or from your actual knowledge of the experience of others, what has been the time and expense of procuring a public-land title? Please state fully as to an uncontested or to a contested case, as the same may have been within your actual knowledge.
6. Have you observed any defects in the practical operations of the land laws which in your opinion ought to be remedied? If so, state fully such defects and any suggestions you may have to offer in the way of remedying them.
7. Please state the conformation and physical character of the public lands in your county, State, or Territory, so far as known to you; and whether agricultural, pastoral, mineral, timber, or otherwise.
8. Examine the act of Congress prescribing the duties of this commission, &c., and, referring to your answer to the last interrogatory, state how, in your opinion, the government can best ascertain and fix the character of the several classes of land named by you; whether by a general rule, or by geographical divisions, or otherwise.
9. State the system of land-parceling surveys which, in your opinion, would be best adapted to the economic uses of these several classes of land, giving your reasons and your practical acquaintance with the subject of surveys.
10. Please make suggestions as to any better method of disposing of the public lands in the West to actual settlers than is prescibed by the existing land system; and either as a whole or in part.

AGRICULTURE.

1. What have you to say about the climate, rainfall, length of seasons, snowfall in the winter, and the supply of water for irrigation?
2. At what season of the year does the rainfall occur, and in what quantity and proportion? Does the greater water supply come at the season when most needed for irrigation?
3. What proportion of your section can be cultivated without irrigation?
4. What proportion can be cultivated with irrigation?
5. What crops are raised in your section by irrigation?
6. How large a quantity of water is required to irrigate one hundred acres of wheat in your section?
7. What is the source and supply of water that could be applied to irrigation?
8. Please state any knowledge you may have from observation or experience on the subject of irrigation, and whether the fertility of the soil has been injured thereby, and to what extent; also, at how great altitudes crops can be raised in your section.
9. What proportion of water in irrigating ditches is exhausted, and what proportion is returned to the streams; and is this return voluntary, or by regulation; and what restrictions, local or otherwise, are placed on the use or waste of water?
10. How far has the water been taken up, and in what manner, and under what laws or local customs?
11. What conflicts, if any, have arisen in relation to water rights?
12. What proportion of your lands is adapted to pasturage only?
13. Is it, in your judgment, practicable to establish homesteads on the pasturage lands; and, if so, what quantity of land should be allotted for pastoral purposes to each settler?
14. Is it, in your judgment, advisable for the government to put these lands in the market for private entry; and, if so, should the quantity to each purchaser be limited?
15. What is the average quantity of pasturage land required in your section to raise one head of beef for market? How does your section compare in this respect with other sections you are acquainted with?
16. What number of cattle is required to support an average family?
17. How many cattle to the square mile are there at present in your section?
18. Has the growth of grass increased or diminished?
19. Do cattle-raisers fence their ranges, or any part thereof? And can cattle be confined with safety in winter by fences on the range?
20. Would the quality of herds be improved and a better beef produced by having herds confined to specific ranges?
21. What is the source of supply of stock water in your section?
22. In grazing, how many sheep are equivalent to one beef?
23. Has the growth of grass increased or diminished on lands pastured with sheep?
24. Will sheep and cattle graze on the same lands?
25. What conflicts, if any, exist between sheep and cattle owners, growing out of the joint occupancy of the public lands, or from any other cause?
26. What is the approximate number of sheep and cattle in your county? And in what sized herds are they herded?
27. What other suggestions have you to offer in regard to the disposition of the public lands and their surveys?
28. Is there any trouble in ascertaining the corners of the surveyed public lands in your vicinity?

TIMBER.

1. How much timber land is there in your section, and what is the character of the timber?
2. What kind of timber, if any, is planted in your section, and what is regarded as the best, and what is the time of its growth?
3. How would you dispose of the public timber lands? State whether by sale, by lease, or otherwise. Give details of your plan and the reasons therefor, stating particularly the price, size of tract, and what limitations, if any, should be imposed upon such disposition?
4. Would you, or not, classify the different kinds of forest lands, whether in manner of disposition, price, or size of tracts?
5. When forests are felled in your region, is or is there not a second growth of timber? If so, state its character, time of growth, and any like information.
6. What have you to say of the origin of forest fires, their extent, destructiveness, and mode of prevention?
7. What have you to say as to depredations upon the public timber, whether for the cutting of railroad ties, use for mineral, building, agricultural, or other purposes? State the extent of such depredations, unnecessary waste occasioned thereby, and what, if any, legislation is necessary to limit or prevent such depredations.
8. What are the local customs as to the cutting of public timber by individuals or corporations? State particularly as to the ownership of felled timber.
9. Would or would not the timber laws be more efficiently executed if their administration and the general custody of the public forests were placed within the jurisdiction of the United States district land officers?

LODE CLAIMS.

1. What experience have you had, and where, and in what capacity, in the business of mining, mine surveying, and mine litigation?
2. What defects, if any, in the United States laws, their operation and administration as applied to lode claims, do you know, either from your own experience or from observation?
3. What is your opinion as to the propriety of the present official practice of filing surveys of lode claims which overlap on the surface? State instances and inferences in full.
4. What do you understand to be the top or apex of a vein or lode? Can or cannot the top or apex, the course, and angle or direction of the dip always be determined in the early workings of the veins or lodes?
5. If no, are the intended rights of a discoverer properly defined and protected by the locating of a claim under the existing laws, of which the foregoing terms are essential parts?
6. Within your experience and knowledge has, or has not, litigation and injustice grown out of the impossibility of determining the above points?
7. Have you known of two seams, parallel or otherwise, of the same outcrop being located by different parties giving rise to contest?
8. If yes, in such a contest have you known of the original locator being cut off in depth by the later locator?
9. Are or are not the outcrops of lodes often wider than the legal width of claims, whether as defined by the United States, State, Territorial, or local district regulation?
10. Do or do not outcrops of narrow lodes sometimes so deviate from a straight line as to pass beyond the side lines of claims?
11. Does the practice under the law of permitting lode locations of alleged lodes on non-mineral ground work to the advantage or disadvantage of the discoverers of true lodes?
12. If A, on the outcrop of a true lode, makes a location and B locates a parallel claim outside the side lines of A's tract, but over the dip of A's lode—B's subsequent location being on an alleged lode, but really on barren ground—can B, who has discovered nothing, cloud the title of A, the discoverer of a true lode, and put him to the cost and inconvenience of an expensive litigation? State instances and give particulars of the same.
13. Are or are not a large majority of the discoverers of rich veins, or their assigns, often burdened with costly litigation to defend their rights from subsequent locators in their immediate neighborhood? And in such cases is or is not the legal attack most often directed to the portion of the dip of the lode which has passed beyond the exterior lines of the surface tract?
14. In view of the known variety and complexity of mineral deposits in rock in place, is it, or is it not, in your judgment, possible to retain in the United States mineral laws a provision by which locators can follow the dip of their claims outside their side lines without provoking litigation?
15. Have you ever taken part in organizing a local mining district? If so, state fully where it was done, by how many parties, and whether necessarily actual miners or citizens. What officers were elected, and their duties? What books of record provided, and their object?
16. State generally the mode of originally taking up and locating a mineral claim under mining customs and the effect of a record of such location?
17. Is that record capable of subsequent amendment; and, if so, how?
18. Within your knowledge, have mining titles been disturbed or litigated through fraudulent manipulation or destruction of these records? If so, what security is there against such frauds?
19. Calling your attention to the fact that a copy of the certificate of location, as certified by the local mining recorder, is the sole basis of the paper title for a mining claim, under existing law, and that compliance with the varying customs of innumerable mining districts constitutes the preliminary acts upon such claims, state whether, in your opinion, all mining district laws, customs, and records could advantageously be abolished as to future location, and the initiation of record title be placed exclusively with the United States land officers.
20. Calling your attention to the fact that under present laws an adverse claim, in proper form and seasonably filed, suspends the administration of the mineral laws by the United States land officers, and transfers the jurisdiction to the courts of law, both State and United States, please state whether, in your opinion, the adjustment of controversies concerning mineral lands prior to issue of patent should not be left absolutely to the United States land officers, in the same manner as contests under all other land laws.
21. If you consider it desirable to retain the leading features of the United States mining laws, what amendments, if any, would you suggest to remedy any defects which your experience or observation has detected? If, on the contrary, you believe that the practice of following the dip beyond the side line of a claim is incompatible with satisfactory administration, what method of location would you suggest?
22. Ought there not to be a limitation as to a possessory title under the mineral laws, and should not locators be compelled, on penalty of forfeiture, to acquire the title by purchase from the government within some reasonable time? If so, what would be your idea of the time?

PLACER CLAIMS.

1. What proportion of the lands in your section are mineral, and what is the nature of the mineral deposits?
2. Are you familiar with the practical operations of the United States mining laws? If so, state how and to what extent.
3. From your personal experience, please state the time and expense of procuring a mineral title, whether possessory or by patent, both with and without contest.
4. State your knowledge of the experience of other parties upon the same points.
5. Within your practical experience, are the existing mining laws as to placer claims defective or otherwise?
6. If defective, state in what particulars; having especial reference to the facts of original location under local customs or laws; the shape and size of such claims; their occupancy and development; the opportunities for consolidating two or more claims in one person by purchase; what evidence of the chain of title is required; what use is made of such claims other than actual working, if any; and what is the general character of the litigation relative to these placer claims.
7. Within your knowledge, are titles obtained under the placer law for non-mineral lands; and, if so, state instances.
8. Within your knowledge, has the placer law been used to obtain titles to lode claims? If so, state instances.
9. Do you know valuable placer lands which are unworked because the outlets are controlled by claimants under other than mineral titles? If so, state instances.

fest injury and disgrace of the public service, without either protecting the timber or rightfully punishing trespassers, and impresses all fair-minded and, at the same time, well-informed men with a spirit of opposition to, and of even revenge upon, the unfaithful officials, which makes it very difficult and disagreeable for honest officers to perform efficient service. Provide an honest, ready way to procure timber land by purchase, and you will, in my judgment, most thoroughly protect unsold timber, insure the best economy in its use in general, and most certainly encourage its reproduction

UNDER HEAD OF "AGRICULTURE."

1. Any true report on New Mexico will be true as to Arizona.
2. Same as above.
3. Crops are not certain every year in any portion without irrigation.
4. No reliable answer can be given, for not one-fourteenth of the area of Arizona has been surveyed, but the proportion must always depend upon the supply of water. Millions of acres of table lands would produce crops with plenty of water; and the truth is that with a perfectly economic and, of course, scientific system of irrigation there is hardly water enough in running and surface streams to produce crops on *all* the rich valley land.
5. Every kind grown in the temperate zone, including many of the fruits and fiber and root products of the tropics.
13. Yes; see answer to question 9.
14. Yes; see answer to question 9.
28. Yes. Surveys have been confined to the best lands, embracing springs and streams. Cattle naturally roam over such land, and they as naturally paw and otherwise rake fresh turned-up earth, and in some sections, to my own knowledge, where the most thorough work was done and conscientious attention was given to building corners with posts in dirt mounds, cattle closely followed the surveyors and almost obliterated mounds and pits. Then, in the valleys, the bearing trees are often taken by wood-cutters, who are mostly ignorant of what they are doing, and by campers generally. Indians and Mexicans pull up the posts for fuel. Other causes might easily be given. If more attention were required to the solid establishment of township corners with careful bearings, and in the open, smooth, grass plains the section corners be marked by some imperishable substance, planted at least two feet deep, the public would be much better served than now.

UNDER HEAD OF "TIMBER."

1. Impossible to approximate quantity without a careful inspection of mountains and cañons hundreds of miles in area. The timber of the mountains embraces pine and fir of commercial value, and oak, cedar, juniper, ash, walnut, wild cherry, and other varieties, of more or less value for building, but mainly for fuel. The rich valley land is mostly covered with mesquite, palo verde, and cottonwood, and the mesquite is abundant and the best fuel of all the timbers. Its abundance in valleys may be correctly inferred from the statements that it is the only fuel used in Tucson, that the town is perhaps two centuries old, and that this wood is yet plentiful within sight of the town, both north and south. East and northeast of Prescott there are bodies of excellent pine, interspersed with fir and other kinds, extending continuously from fifty to over one hundred miles over mountains and high, rocky, and grassy table land; and in the cañons and near the summits of all the mountains in eastern, southeastern, and southern Arizona, east of 111° longitude, there is pine timber of excellent quality for all kinds of building, including quartz-mills. The mesa or table land contains considerable scrub oak, cedar, juniper, and other inferior varieties, of much value, but almost exclusively for fuel.
2. Very little is planted. Cottonwood, willow, and ash are the kinds I have observed. Cottonwood is preferred, and the time of its growth evidently depends upon the size required or desired.
3. See reply to No. 9 (page 4 this letter) in first series of your questions.
7. Substantially answered in No. 9, first series, on page 4 of this letter.
8. No customs of which I am aware. Men in want of timber for their own use or sale generally hunt till they find it to suit their purposes and take it. The only protection they have from others is in the ownership of a costly private road, over which public sentiment justifies them in excluding travel or traffic in general and particular. To procure lumber at rates within any reasonable price private enterprise of this kind must be encouraged, otherwise lumber would have for the most part to be imported, or each person in want of boards take a saw-mill or whip-saw and go to the mountains, saw, and haul it himself—a practically impossible way.
9. Yes; vastly better executed than by special agents. District land officers mostly have local interests and are actual residents, and their reputation and good policy are

combined in their favor; but the best protection as well as encouragement to growth of timber will be found, in my opinion, in transferring as speedily as possible the title to timber-bearing lands from government to individuals.

UNDER HEAD OF "LODE CLAIMS."

1. As surveyor-general. No litigation.

2. Answered in following replies.

4. The highest point at which the ore or rock is found "in place," or between the walls of the vein, and not a "blow out," or part of ledge broken down outside of the walls. The "top or apex," in my view, is often not found until after costly and extensive explorations.

5. Section 2 of the mining act of May 10, 1872, provides that "no location of a mining claim shall be made until the discovery of the vein or lode within the limits of the claim located." If this provision of law were fully complied with, all rights of a discoverer can be fully protected under existing law.

11. Unquestionably it works to their disadvantage, and if the law were rightly enforced (as per section 2), no such locations would have a moment's consideration or standing before any tribunal or officer.

13. Yes, and the "legal attack" is aimed at the pocket of the honest claimant although the approach may be by way of the said "dip."

14. Yes, so as to not provoke honest litigation; but my observation of over fifteen years among lode mines convinces me that no law that the ingenuity of man can devise will prevent blackmailing litigation, if not in the respect referred to, in some other.

16. The mode generally adopted or followed throughout Arizona is that prescribed by the mining act of May 10, 1872, and the General Land Office regulations thereunder.

17. In my view, it is capable of lawful amendment, viz: A claimant in *undisputed* possession finds the record of location incomplete or wanting in lawful requirements. He relocates by reciting in his notice the fact of his original location and continued and undisputed possession; that the new location is made for the sole purpose of perfecting the original one and to meet the requirements of law and regulations, &c., and then have said notice duly recorded. Thereafter abstracts of title would show two locations, with the reasons therefor, by the original locators or their lawful grantees.

19. Emphatically, yes. To lode claims the same law and regulations should apply in all parts of the United States, and *all* local, State, Territorial, and district laws should be wiped out by an act of Congress which should prescribe, with all the clearness the English language is capable of, *just* what each claimant or locator should do and perform from the first act of location to the receipt of patent.

20. Emphatically and unreservedly, yes. An honest claimant contemplates with horror and despair in about equal proportions a contest which involves an array of attorneys, witnesses, and jurors, with their attendant demands, and without hope that after all demands are met the merits of his case will have little or no weight in making up the verdict.

21. I would retain all the provisions of the mining act of May 10, 1872, which experience has proven suitably adapted to acquiring title to lode claims. I would retain the old structure but cut off and build on. The public is familiar and content, so far as I have heard, with much of the act. I will offer but few suggestions in detail. I would retain the provisions requiring end lines of claims to be parallel in all cases wherein the ground at the time of location will permit, and provide also for locating and patenting in any shape in cases of remnants of unclaimed ground *between locations made in accordance with the law as now required.* Without such provision there will always remain small tracts, from a few feet to one hundred or more in length and of all conceivable shapes, unclaimed and certainly unsold by the United States. Most all such tracts could be sold at $5 per acre if provision were made therefor by law, no matter whether they contained mineral of much value or not. While I would give a claimant six hundred feet in width, I would modify the law with regard to limiting him to three hundred feet on either side of the middle of the vein. Locations made in good faith do not always and in the nature of things cannot be always made to strictly conform to this requirement, and before the error can be corrected subsequently acquired rights prevent a correction.

If a claimant have a clearly defined lode *within the limits of the* 600 *feet in width*, I would maintain him in the whole of the surface ground, and let him follow the dip of the vein as now provided. I would not permit the patenting of mill sites, even in connection with a *bona fide* mining claim, unless such mill site were practically occupied with ore-reduction machinery of some kind. Many choice pieces of ground are claimed and held under present law for merely speculative purposes, and owing to the refusal of Congress to appropriate money for the survey of pasturage lands *cienegas* or springs are sometimes taken and held for stock purposes, but done under the min-

ing law providing for locating and patenting of mill sites. I would also permit mill sites to be located upon mineral land, since the full price of $5 per acre is exacted. It often happens that the choicest mill sites (for steam machinery) are on mineral land, though rarely of great value as such, yet under present law the fact of its being mineral prevents the best and most necessary use to be made of the land at *any price*, unless claimed and patented as mineral land.

22. Emphatically no. Continuous possession, with practical work thereon, should be regarded *in law* as the very best of title. To limit the time, upon penalty of forfeiture of claims, in which to acquire title or patent (as I presume patent is meant) by purchase would open perpetual occupation to the army of blackmailers. If the law could and would fix the limit of time in which such creatures should establish a superior right, then a like limit might safely be fixed for the continuance of a possessory title in the case of honest claimants.

Without perhaps taking fully into consideration all the points in the premises, I would favor a change in the laws so as to not exact payment for land of any class (save in sales at private entry and auction) until patent should be placed in the hands of the local land office for delivery. It seems as if government should not, as it does now, demand payment long in advance of giving patent. An actual and *bona fide* occupant of public land is least able to pay, as a rule, when patent is applied for, and I certainly would give him the benefit of the use of the price of the land up to the very day government were ready to hand him a patent for his money. If Congress fail to appropriate money to enable the General Land Office to promptly examine applications for and issue patents to land, I would not punish an honest man by compelling him to pay for it in advance—sometimes several years—of receiving title. It is not, in my judgment, a sufficient answer to say that government exhibits large liberality in permitting settlers to live upon and have the benefit of public land several years without any pay, because thousands of settlers, owing to the uncertainty of life and human affairs in general, would prefer to promptly pay for their land if title could be had. With title the land is an available security, and the possession of patent is the best stimulant to care and improvement.

Very respectfully, your obedient servant,

JOHN WASSON,
United States Surveyor-General.

Grants of land by Spain and Mexico, in the ultramarine possessions of the Spanish Crown.

The ancient laws of Spain declare that the ownership and full dominion of conquered kingdoms belong to the monarch. (Law II, Title I, Partida II.)

Wherefore, the West Indies having been conquered by the arms of the Catholic king and queen, Fernando and Isabel, in the sixteenth century, in consideration of the fact that no person can live without the means of subsistence, and no city exist without the rents necessary for its support, their majesties thought proper to cede to the towns (poblaciones) of America and to the councils of the same certain portions of lands from which to derive their support, using the same for pasturage and cultivation, or in the manner that may be directed by the municipal ordinances; these lands were denominated *consejiles*, or *de propios*.

Another portion of the (conquered) lands was distributed by concession of the king to those who assisted in conquering the country as rewards for their services; and lands were also sold to individuals (particulares) for the purpose of obtaining means to supply the necessities of the crown. These lands, donated or sold, were denominated *de dominio particular* (of private property), as in fact they are, because the full ownership thereof was transferred to the donees or purchasers, and hence they are truly private property.

The usufruct of the remaining lands was ceded by the kings to all their vassals, that they might make use of their pastures, woods, waters, and other natural productions, for the support of their flocks and herds; which lands are called "common lands," because they are for the common use. They are also called *valdios* (vacant lands), because nothing is paid for the use of the pasturage, or fire-wood that may be cut thereon. They are also *redlengos* (royal lands), because the dominion and property thereof are reserved to the king by his right of conquest, although he ceded the usufruct of the same to his vassals. (Law III, Title VIII, Book VIII, del Ordenamiento; Law X, Title XV, Book II, Recopilacion; Law II, Title I, Book III, del Ordenamiento; Law I, Title V, Book VII, Recopilacion.)

For the disposition and settlement of the *realengo* lands of Spanish America, royal decrees were from time to time issued, and laws and ordinances passed, changed, or

modified to suit the circumstances of the times, having for their end a proper disposition of the *realengo* lands and the encouragement of the occupation of the country by the actual settler. The royal decree of the 24th of November, 1735, required petitioners for *realengo* lands to apply to the royal person of the king for a confirmation of their titles. This decree, however, was found to be prejudicial to the settlement of the *realengo* lands, the expenses attending such applications being so great as to prevent many persons from applying for these lands; wherefore to remedy this difficulty were issued the royal instructions of the 15th of October, 1754.

Article 1st of these instructions provides that from the date thereof the power to appoint sub-delegate judges to sell and compromise for vacant lands of the royal domain shall belong exclusively to the viceroys and presidents of the royal audencias of the kingdom, who are required to notify the sub-delegate judges of their appointments and furnish them with a copy of the instructions, the viceroys and presidents being required to give immediate notice to the secretary of state and universal dispatch of the Indies of the ministers whom they might appoint as sub-delegate judges of their respective districts.

Article 3d provides that all persons who shall have possessed royal lands, whether settled and cultivated or not, from the year 1700 till the date of the publication of this order, may prove before the sub-delegate the titles and patents in virtue of which they hold their lands.

Article 4th provides that persons in possession of royal lands by virtue of sales or compositions made by sub-delegates before the year 1700, although the same may not be confirmed by the royal person of the king shall not be disturbed in the possession thereof.

Article 5th provides that the possessors of lands sold or compromised for, from the year 1700 till the present time, shall not be disturbed in the possession thereof, provided their titles have been confirmed by the royal person of the king or by the viceroys and presidents of the audencias during the time that they exercised this faculty; but such possessors of lands as have not obtained such confirmations shall apply to the audencias of the district to have their titles confirmed. Under this decree or instructions the preliminary proceedings of survey, valuation, publication, and sale of the *realengo* land petitioned for having been taken by the minister sub-delegado of the district in which the land was situated, the expediente showing such proceedings was transmitted to the real audencia for approval; and if the proceedings were found to be regular, they were approved and the title was issued and registered in a book kept for that purpose.

The provinces of Sinaloa and Sonora belonged to the real audencia of Guadalajara, and hence the sales made of *realengo* lands in these provinces under the decree of 1754 were registered in the office of the real audencia in the city of Guadalajara.

The law of 1754 remained in force until the 4th of December, 1786, when to cure some defects and remedy some inconveniences found in the practical workings of said law the royal ordinances of intendentes were issued. Under these royal ordinances the Kingdom of New Spain was divided into twelve intendencias, exclusive of the Californias, one of which was to be the general intendencia of the army and province and to be established in the capital of Mexico, and one, the intendencia of Sonora and Sinaloa, the capital of which was established at the city of Arizpe.

The viceroy was to exercise the superior authority and the various powers conferred on him by royal commission and by the laws of the Indies as governor and captain-general, but the superintendency of the royal treasury, in all its branches and revennes, was committed to the care, direction, and management of the general intendency of the army and treasury, established in the capital of Mexico. A superior junta was established in the capital, having jurisdiction over all matters relating to the royal treasury and the army, and also over the public property and revenues.

Article 81 of these ordinances provides that the intendentes shall be the exclusive judges of all causes and questions that may arise in the district of their provinces in relation to the sale, composition, and grant of *realengo* lands.

Under these ordinances the proceedings preliminary to a grant of *realengo* lands were taken in the same manner as under the law of the 15th of October, 1754, but [illegible]se proceedings, instead of being referred to the real audencia for approval, were [illegible]mitted to the intendente, who referred the same for examination to the promotor fiscal, who made a report thereon; whereupon they were referred by the intendente to the "provincial junta de hacienda," and when approved were transmitted through the office of the comandante-general to the city of Mexico for final approval by the "superior junta de hacienda," and, if found to be correct, the proceedings were approved, the approval registered in the proper book, and the expediente returned to the province where it belonged.

On the 22d day of October, 1791, Don Pedro de Nava, comandante-general of western provinces, made a decree to the effect that, "notwithstanding what was provided in article 81 of the ordinances of intendentes," captains of presidios were authorized to grant house lots and lands to soldiers and settlers who might desire to establish

themselves under the protection of the presidio. These grants were, however, limited to the territory embraced within four square leagues, measured one league from the presidio to each of the cardinal points. The motives of this decree are manifest; they were that the soldiers of the presidio might make homes for their families, and that pueblos might grow up around the presidial establishments.

The ordinances of the 4th of December, 1786, were further modified by the royal decree of the 23d of March, 1798. This decree provides that when the value of the *realengo* lands petitioned for and sold by the intendente does not reach the sum of $200 it shall not be necessary to refer the proceedings to the superior junta for approval. The reason for the issuance of this decree was that the expenses attending a reference to the superior tribunal were often greater than the value of the lands sold, which prevented persons of small means from making application for *realengo* lands, and much retarded the settlement of the country.

Under these ordinances, with the modifications referred to, grants of *realengo* or royal lands continued to be made until the dominion of Mexico was lost to the crown of Spain by the revolution which resulted in the independence of Mexico in 1821.

From the foregoing laws, ordinances, and decrees it is seen that the constant policy of Spain was to encourage by all means the settlement of her possessions in the New World; that, while the absolute ownership of the *realengo* lands was retained by the crown, laws from time to time were passed for the purpose of enabling actual settlers to obtain titles to so much of these *realengo* lands as they required for their use and occupation in the pursuits of agriculture and stock-raising; yet, while the terms under which titles to these *realengo* lands could be obtained for actual use and occupation were made so easy as to be within the reach of petitioners of humble means, still the government guarded with jealous care their disposition by passing such laws as made it impossible for the vassals of the king to acquire them for any other purpose than that of actual use and occupation.

Grants of "terrenos valdios," or vacant lands, by the Government of Mexico subsequent to the year 1821.

The revolution of 1821 changed the form of the Government of Mexico without producing any radical change in the habits or thoughts of the people. In 1822 an imperial government was established, which, however, was soon abolished, and the republican form adopted, and in 1824 a federal constitution was formed, modeled somewhat after that of the United States. On the 4th of August, 1824, the sovereign constituent congress of the United States of Mexico passed decree No. 70, in which are specified the sources of the federal revenues, and the eleventh article of this decree recites "that the rents that are not included in the preceding articles of this decree belong to the States." As a compensation for this concession by the general government the sum of $3,136,875 was required to be paid yearly by the states for the support of the general government. This sum was apportioned to the different states according to their population and wealth, the sum apportioned to the State of the West (Estado del Occidente,) embracing the Spanish provinces of Sonora and Sinaloa, being $53,125. Under this law grants or sales of land were made in the State of Sonora from 1824 down to the time when the system was changed by legislative enactment.

After the independence of Mexico, the old intendencia of the Spanish Government, embracing the provinces of Sonora and Sinaloa, was called El Estado del Occidente (the State of the West), continuing united under that name until about the year 1830, when they were divided by the boundary as it now exists.

On the 20th of May, 1825, the constituent congress of the free, independent, and sovereign State of the West (Estado del Occidente) passed provisional law No. 30, regulating the system of selling the public lands. Under these provisional regulations the prices at which the public lands could be sold were graduated according to the location and quality of the land. The quantity allowed to one individual was limited to four square leagues, unless the applicant could satisfy the government that he required more for the use of his stock. Under this provisional law the State of the West, in making grants or sales of land, continued the system that had been established by the Spanish Government. The same formalities were observed; the lands were surveyed, valued, published for thirty days, and at the end of that time were sold at public auction to the highest bidder, the treasurer-general of the state occupying the same position under the state government that the intendente did under the Spanish Government. The grants, however, issued by the treasurer-general required no approval by the supreme government.

Between the time when grants cease to be made within the jurisdiction of the intendencia of Sonora and Sinaloa by the authorities of the Spanish Government and the time when they were made by the authorities of the "Estado del Occidente" under the law of the general congress of 1824 and the provisional law of the congress of the state of 1825, the granting power was exercised by an officer entitled *comisario general, provisional de hacienda, credito publico y guerra*, whose headquarters, as shown by

the records of the times, were generally at Fuerte, a town in Sinaloa, near the northern boundary of the State.

Report of special agent, Mr. R. C. Hopkins, states: "That notes on expedientes of grants of land in the government archives of Sonora show that about the year 1825 a number of grants were issued by the above-named officer, on proceedings which under the Spanish Government had not gone beyond the approval of the provincial junta de hacienda," having doubtless at that point been arrested by the revolution of 1821. In these cases no borradores or draughts of title are found in the expedientes, but notes are found of the register of the grant in *cuardeno* No. 2 in the office of the comisario general.

On the 30th of May, 1834, the constituent congress of the State of Sonora issued decree No. 10, which provides as follows: "Article 1st. Six months' further time is granted to possessors of lands who have failed to obtain titles of ownership thereof, as required by decree No. 10 of the 28th of June, 1833."

Article 2d declares that if at the end of this time, which shall not be extended, the possessors of lands shall not appear and make their grants effective, their lands shall be denounceable, and the claimants thereof shall be subject to the penalties imposed by the organic law of the treasury, which is about to be passed. This law was required to be circulated and published in all the pueblos of the State, the respective authorities being directed to furnish exact lists of the lands in their districts for which titles had not been obtained.

On the 11th of July, 1834, was passed the "ley organica de hacienda" (organic law of the treasury). Article 57 of this law provides: That any one having necessity for a tract of land for grazing or other purposes shall present himself before the treasurer general, applying therefor in the name of the State, accompanying his application with the testimony of three impartial witnesses in relation to the circumstances of the petitioner, character of land, &c.

Article 58 declares that to no new settler (*creador*) more than four square leagues shall be granted or sold, unless it can be shown that, on account of the abundance of stock owned by such new settler, he needs more; in which case the treasurer general will concede him only so much as he may need, as shown by the testimony of impartial witnesses.

Article 60 declares that the treasurer general, as the immediate chief of all the revenues, shall make sale of the lands and issue titles therefor.

Article 61 declares that those who possess lands to which they have not obtained titles, although the lands have been applied for and surveyed, shall present themselves to the treasurer general within the time designated by the law No. 10 of the 30th of May of the current year (six months from 1st of June, 1834). The lands of the proprietors, which may not be regulated in accordance with this disposition, shall remain vacant and denounceable, provided the proprietors thereof shall not present themselves and make application for their titles within the time prescribed by said law, setting out in writing the cause of the failure to obtain title.

Article 62 directs the treasurer general to refer these matters to the promotor fiscal for his opinion, whereupon the matter will be determined in view of the rights of the interested party and of the public treasury.

Article 63 requires grantees of lands to construct boundary monuments of rough stone and lime within three months after the issuing of the title, and failing to do so, they have to pay a fine of $25 and the cost of constructing the necessary monuments.

Article 64 fixes the value of the public lands as follows: For dry lands only suitable for grazing, $15 per square league; for such as may be irrigated from reservoirs and contain pasture, $40, and without these circumstances, $35 per square league; for such as may contain springs or rivers, but are dry and broken, $60 per square league, and $80 per square league for such as are very fertile and suitable for agriculture. These were the minimum prices, for less than which lands could not be sold in any case whatever.

Article 72 directs the surveyors to appoint as appraisers of the lands petitioned for persons who are free from prejudice and not especially partial to the petitioner.

Grants made subsequent to the passage of the foregoing law refer to the decree of the general congress of the 4th of August, 1824, and to the decrees of the congress of the State of Sonora of the 30th of May, 1825, and of the 11th of July, 1834, as the basis on which they were made; and all the grants of land in Sonora since the passage of these laws were made under the authority thereof.

Grants under the laws of colonization.

To encourage the settlement of the vacant lands of the republic, the sovereign general constituent congress of the United States of Mexico, on the 18th of August, 1824, passed a law, article 1st of which declares: "That the Mexican nation offers to foreigners, who may come to establish themselves in the territory, security in their persons and property, provided they submit to the laws of the country."

Under this law any lands of the nation that did not belong to private individuals or pertain to corporations or pueblos were subject to colonization, except such as were embraced within the twenty leagues bordering on a foreign territory, or the ten leagues bordering on the seashore. In the granting of these lands Mexican citizens were to be preferred to foreigners. To carry into effect this general law the congresses of the states were to form such laws and regulations as might be necessary, in accordance with the general constitution and principles established by this law.

The maximum quantity that could be granted to one person under this law was eleven square leagues; one of irrigable, four of arable, and six of pasture lands.

The concluding article declares that, in accordance with the principles established by this law, the government will proceed to colonize the territories of the republic.

Under this law grants were made in the territory and department of the Californias down to the change of government on the 7th of July, 1846.

On the 4th of April, 1837, a decree was issued "to render effective the colonization of the lands of the republic." This decree declares the government, in concert with the council, shall proceed to render effective the colonization of the lands which may be, or should be, the property of the government, by means of sales, leases, or mortgages, applying the proceeds thereof (which in case of sale shall be at a price not less than $1.25 per acre) to the extinguishment of the national debt, which has already been or may be contracted; always reserving a sufficient quantity to fulfill the promises made to the soldiers, as a reward for their services in the war of independence, and also sufficient to satisfy the concessions made by congress as Indian reservations, and to those who had assisted in the re-establishment of the government in Texas.

On the 15th of September, 1837, an agreement was entered into in the city of London between the agents of the Mexican Government and the holders of Mexican bonds to the following effect: Article 1 provides for the consolidation of the national debt at 5 per cent. interest per annum. F. de Lizardy & Co. were appointed as agents of the republic to act in the matter; these gentlemen to issue, in the name of the Mexican Government, the corresponding bonds of the consolidated fund in sterling money, payable in London on the 1st of October, 1866. A certain class of these bonds were receivable in payment for vacant lands in the departments of Texas, Chihuahua, New Mexico, Sonora, and California, as might be desired by the purchaser, at the rate of £1 sterling for four acres; interest to run on the bonds until the purchasers of the lands should be placed in possession thereof.

Article 7 of this agreement provided that the payment of the principal and interest of these bonds should be secured by a mortgage, in the name of the Mexican nation, on one hundred millions of acres of the vacant lands of the departments of the Californias, Chihuahua, New Mexico, Sonora, and Texas.

On the 1st of June, 1839, the foregoing agreement was approved by decree of President Santa Ana.

Attempt of President Santa Ana to annul grants made in the territory of the republic after 21st of September, 1821.

On the 25th of November, 1853, President Santa Ana issued a dictatorial decree declaring: "That the vacant lands (*terrenos valdios*) being the exclusive property of the nation, could never have been alienated by any title whatever, by virtue of decrees, orders, and dispositions of the legislatures, governments, or authorities of the states or territories of the republic; wherefore such sales, cessions, and alienations as may have been made of the vacant lands, without the express order and sanction of the general powers in the form prescribed by law, are declared null and void." On the 7th of July, 1854, President Santa Ana issued a second decree in relation to public lands, requiring all titles of the alienation of public lands made in the territory of the republic from September, 1821, to the date of the decree, given either by the general authorities or by the extinguished states and departments, shall be submitted to the revision of the supreme government, without which they shall be considered of no value, nor shall they convey any right of property. The foregoing decrees of President Santa Ana were annulled as follows: "On the 3d of December, 1855, Juan Alvarez, president *ad interim* of the Mexican Republic, issued a decree abrogating in all their parts the decrees of the 25th of November, 1853, and of the 7th of July, 1854, issued by President Santa Ana, and declaring that all the titles issued during the period referred to in said decrees of 1853 and 1854 by the superior authorities of the states or territories, under the federal system, by virtue of their legal faculties, or by the authorities of the departments or territories, under the central system, without the express authorization or consent of the supreme government for the acquisition of said lands, the same being in accordance with existing laws in relation to such alienations, shall in all time be considered as firm and valid, the same as the titles to any other property legally acquired, without in any case being subject to a new revision or ratification by the government."

This decree further declares: "That the alienations of vacant lands that may have been made by the authorities of the states, departments, or territories, without the requisites mentioned in the foregoing article, and in contravention of the requirements of article 4 of the law of congress of the 18th of August, 1824, are null and void, and the possessors of lands in such cases shall be subject to such penalties as may be imposed by the laws of the republic."

Article 4th of the law of the 18th of August, 1824, above referred to, is as follows: "The territories embraced within the twenty leagues bordering on a foreign nation, and the ten leagues bordering on the sea, cannot be colonized without the previous approval of the Supreme Government." Decree of President Alvarez further declares: "That the concessions or sales of vacant lands which may have been made by competent authority and in accordance with the laws in force controlling the same, under the express obligation of colonizing them within a fixed time, on a failure to comply with this condition shall be void, the land in such case reverting to the nation." The decrees of President Santa Ana of 1853 and 1854 were also abrogated by the act of the Mexican Congress of the 16th of November, 1856. But even if the dictatorial decrees of President Santa Ana had not been declared null, they could not affect the Mexican grants in Arizona, since the treaty was signed on the 25th of September, 1853, while the decree of Santa Ana was not issued until the 25th of November, 1853, and that although ratifications of the treaty were not exchanged until after the 25th of November, 1853, these ratifications have a retroactive effect, relating to the date of the treaty, (September 25th, 1853), and bound both governments from that date.

From the foregoing historic sketch of the laws, ordinances, and decrees of the governments of Spain and Mexico in relation to the disposition of public lands is gathered: 1st, that under the ancient laws of Spain the full dominion of a conquered kingdom was claimed by the monarch by right of conquest. 2d, that the lands of the conquered kingdoms were divided into three classes; *first*, such as were conceded for the establishment and support of pueblos, which were denominated *consejiles* or *de propios; second*, such as were granted by the king to those who had assisted in conquering the country, and such as were sold to individuals, for the purpose of obtaining means to supply the necessities of the crown, which lands were denominated *de dominio particular;* and *third*, such as remained of the conquered kingdom, which were called "common lands," "vacant lands," and "royal lands." 3d, that the usufruct of this last-mentioned class of lands was ceded by the kings to their vassals, under the provisions of such laws as from time to time were passed in relation thereto. 4th, that these royal lands were granted for use and occupation, and that the quantity granted was limited to such an amount as the applicant might need and was able to use and occupy. 5th, that up to the 15th of October, 1754, grants or concessions of royal lands required the approval of the king. 6th, that from the 15th of October, 1754, to the 4th of December, 1786, grants of land were issued by the real audencias, and did not require the approval of the king. 7th, that from said 4th of December to the date of the Mexican independence grants of the royal lands were made by the intendentes or governors of provinces, and required the approval of the "superior junta de hacienda" established in the capital of Mexico. 8th, that the exceptions to this rule are as follows, to wit: On the 22d day of October, 1791, Don Pedro de Nava issued an order permitting captains of presidios to make grants within the four jurisdictional leagues of the presidio, and in 1798 grants of the royal lands of a value less than $200 did not require the approval of the "superior junta de hacienda." 9th, that on the change of governments in 1821 the *realengo* or royal lands of the Spanish Government became the public lands of the Republic of Mexico, and continued to be disposed of to settlers, by valuation and sale, much in the same manner as they had been under the Spanish Government. 10th, that the act of the Mexican congress of the 4th of August, 1824, gave to the State of the West (Estado del Occidente), composed of the states of Sonora and Sinaloa, the public lands embraced therein, requiring from the state for this concession the annual payment into the federal treasury of the sum of $53,125, and that based upon this act of the general congress the congress of the states of Sonora and Sinaloa united, on the 20th of May, 1825, passed a provisional law providing for the disposition of the public lands, which provisional law was followed by the organic law of hacienda, passed by the congress of the state on the 11th of July, 1834, confirming the provisional law of 1825, with some amendments thereto. 11th, that on the 18th of August, 1824, the general congress of Mexico authorized the colonization of such lands of the nation as did not belong to individuals or corporations, directing the legislatures of the states to make such laws or regulations as might be necessary for the carrying into effect the provisions of this general law within their respective jurisdictions. 12th, that the provisional regulations made by the congress of Sonora on the 20th of May, 1825, for the disposition and settlement of the public lands, may be considered as authorized to be made by the act of the general congress of the 18th of August, 1824. 13th, that on the 25th of November, 1853, and the 7th of July, 1854, General Santa Ana, by dictatorial decrees, attempted to annul the grants of land made subsequent to the 15th of September, 1821, which decrees were abrogated by decree of

president Alvarez on the 3d of December, 1855, and by act of the Mexican congress, passed November 16, 1856. 14th, that grants of the *realengo* or royal lands were made by the Spanish Government, for settlement, use, and occupation, and that grants under the Mexican laws of colonization, and under the provisional regulations made by the congress of Sonora and Sinaloa, of the 20th of May, 1825, and the organic laws of hacienda of the 11th of July, 1834, were made under the condition of occupation within a limited time, under penalty of a forfeiture of the right granted, unless a good cause could be shown why the condition of occupation had not been complied with.

Wherefore, since grants of the public lands were given on condition that they continued to be occupied, and if abandoned they were subject to denouncement and could be regranted by the government, it is manifest that these grants of the public domain by the government were conditional, and did not pass the absolute title or fee of the land.

Mines and minerals.

In accordance with Interior Department instructions, I have collected information from authentic sources in reference to the laws of Spain and Mexico respecting minerals and what conditions attached to grants embracing mines.

From the earliest European settlement of the country mining for the precious metals constituted the principal branch of industry in Spanish America, and being the one that yielded the largest revenue to the government, laws and royal ordinances were from time to time passed for the encouragement of the adventurous prospectors and for the protection of the fortunate discoverer of mines of the precious metals; yet, although these laws and ordinances dignified the mining profession by attaching thereto the privileges of nobility, still the government went no further in its liberality than to grant the miner the exclusive privilege of working the mine he might have discovered in the manner required and under the conditions imposed by the laws and ordinances in relation thereto; and when these conditions were disregarded or violated the ownership of the mine, or rather the exclusive right to work it, was lost, and the same reverted to the government, to be acquired by any one else who might undertake to comply with the conditions under which it had been granted to the former owner, the absolute ownership of the mine ever remaining in the government.

Joaquin Escriche, in his Diccionario Razonado de Legislacion y Jurisprudencia (a standard authority), under the head of Minas, says: "According to the ancient Roman law, mines of gold, silver, copper, iron, and other metals pertained to the owner of the land on which they were discovered, *erant privati, juris, et in libero privatorum usa juris comercio*, because they are benents bestowed by nature, to be enjoyed by the owners of the land producing the same. Subsequently the Roman emperor appropriated one-tenth of the products of the mines of every character.

"Under the Spanish law a different rule was adopted; mines of gold, silver, lead, and other metals could not be worked without royal permission, since they (and also salt pits) belonged to the king. Any one was permitted to 'dig' in search of minerals or stones on his own lands, or on the lands of others with the consent of the owner, under the condition that the discoverer should receive one-third part of the net proceeds of the discovery, the other two-third parts to be given to the government. Every Spaniard or foreigner was permitted to 'dig' in search of minerals on public or private lands, under the obligation of compensating for the damages occasioned. In Mexico, Venezuela, and Chili the matter of mines is governed by the ordinances of the 22d of May, 1783." (Escriche, new edition, printed 1869, Mina.)

As early as the year 1383, Don Alonzo XI issued a "pragmatica" in which it is declared: "That all mines of silver and gold and lead, and of any other metal whatever, of whatsoever kind it may be, in our royal scigniory shall belong to us, therefore no one shall presume to work them without our special license and command; and also the salt springs, basins, and wells which are for making salt, shall belong to us, wherefore we command that they revert to us with the produce of the whole thereof, and that no one presume to intermeddle therein except those to whom the former kings, our predecessors, or we ourselves may give them as a privilege, or who may have held them from time immemorial." (*Vide* Book VI, Title XIII, Law II, Recopilacion de Castilla; Book IX, Title XVIII, Novisima Recopilacion.)

The law of Philip II, 1559, declares: That inasmuch as the discoverers of mines, after having discovered and registered them, pretend that by that act alone they have acquired such a right to them that no other person can, within the limits and space of such mines, enter, or try, or work, and that they can thus keep them encumbered without working them themselves or permitting others to do so, by which they prevent the principal produce and profit which belongs as well to us as to our subjects and to the public welfare, since that principally consists in the working and reduction of mines and metals, and not merely in their discovery, we declare and command that such discoverer of the mine or mines of silver, after having made registry in the manner pre-

scribed, shall be obliged within six months to sink and excavate to the depth of three *estados* (a measure of about six feet), and not sinking and excavating his mine to the depth of three *estados*, it may be denounced before the judge and registry made thereof as of a vacant or undiscovered mine. Also, that we reclaim, resume, and incorporate in ourself, in our crown and patrimony, all the mines of gold and silver and quicksilver of these kingdoms, in whatsoever parts and places they may be and are found, whether in royal lands, or in those of lordships, or of the clergy, and whether in public, municipal, or vacant lands, or in inheritances, places, and soils of individuals, notwithstanding the grants which by us and by the kings, our predecessors, have been made to any persons, of whatsoever condition, rank, and dignity they may be. (Book VI, Title XIII, Law IV, Recopilacion de Castilla. Also, Book IX, Title XVIII, Law III, Novisima Recopilacion.)

Royal ordinances for the direction, regulation, and government of the important body of mining of New Spain and of its royal tribunal general, May 22, 1783.

Article I, Title V, declares: That mines are the property of the royal crown, as well by their nature and origin as by their reunion declared in Law IV, Title XIII, Book VI, Nueva Recopilacion.

Article II, same title, declares: That without separating them from the royal patrimony, they are granted to the subjects of the king in property and possession, in such manner that they may sell, rent, donate, and pass them by will, either in the way of inheritance or legacy, or in any other manner alienate the right which in the mines belongs to them, on the same terms on which they themselves possess it, and to persons capable of acquiring the same.

Article III, same title, declares: That this grant is understood to be with the conditions that the grantees contribute to the royal treasury the prescribed portion of the metals, and that they shall work the mines in the manner prescribed by the ordinances, so that they shall be considered forfeited whenever a failure shall occur in complying with the ordinances in which it is provided, and that they may be granted to any person who for that cause may denounce them.

Article I, Title VI, declares: That the discoverers of one or more mineral hills, absolutely new, may acquire on the principal vein which they may select as many as three *pertenencias*, continued or interrupted, according to the measurements which shall be prescribed, and if they may have discovered more veins, they may have one *pertenencia* on each vein, said *pertenencia* being determined and marked out within ten days. (A *pertenencia* was in extent two hundred *varas*, measured on the vein, the width being determined by the dip or angle thereof, being sufficiently wide to prevent the vein from being cut by a shaft sunk on a side claim, at a depth of less than two hundred *varas*, this being the depth beyond which, in those times, it was considered unprofitable to work a mine.)

Article X, same title, declares: That if the denouncer of a mine does not put his working-shaft in order nor take possession within sixty days, he shall lose his right, and the mine may be denounced by another.

Article XIV, same title, declares: That any one may discover and denounce a vein or mine, not only in common land but also in the private lands of any individual, provided he pays for the land of which he occupies the surface, and the damage which immediately ensues therefrom, according to the valuation of the experts appointed by both parties, and a third in case of disagreement.

Article II, Title IX, provides: That no one shall be permitted to work mines without the direction and continual assistance of one of the intelligent and practical experts who in New Spain are called *Mineros* or *Guarda-minas*, who must be examined, licensed and affirmed by one of the professors of mining, which each *Real* or *Asiento* must have.

Article XIII, same title, declares: That as mines require to be worked continually and incessantly in order to procure their metals, and as they require in them works and operations which can be executed only in a long time, and as their re-establishment, if their working be suspended and interrupted, will cost as much as in their original undertaking, therefore to obviate this inconvenience, and also to prevent any owners of mines who cannot or will not work them, from keeping them without use, and for a long time impeding by pretended working, the real and effective labor which others might bestow upon them, I order and command that any one who shall for four consecutive months fail to work a mine with four operatives regularly employed and occupied in some interior or exterior work of real utility and advantage, shall thereby forfeit the right which he may have to the mine, and it shall belong to the denouncer who proves its desertion.

Article X, same title, declares: That no mine shall be abandoned without first informing the deputation of the district, in order that it may be published by fixing notices on the doors of the churches and other accustomed places, so that all may have notice thereof.

Article II, Title XIX, grants in favor of scientific professors of mining the privileges of nobility in order that all persons who devote themselves to this important pro-

fession and occupation may be considered and treated with all the distinction due to so noble a profession.

According to Escriche, the laws of Spain passed prior to 1821 and the laws of Mexico passed since that date have not changed the fundamental principles laid down in the ordinances of the 22d of May, 1783, in relation to the ownership of mines and the manner of acquiring title thereto; hence these ordinances have been in force in Mexico since the date of their passage in 1783, the Mexican mining laws passed since the year 1821 not having essentially changed the spirit thereof.

From the foregoing it is manifest that under the laws and royal ordinances of Spain, from very early times down to the date of the independence of Mexico, and under the mining laws of Mexico down to the publication of the new edition of Escriche (1869) the miner could acquire no absolute title or fee in any mine discovered by him in any part of the Mexican territory, the usufruct thereof being all that was granted him by the government, and this under such regulations, instructions, and conditions as were imposed by law; and when these conditions were not complied with, the right to work the mine was lost, and could be acquired by any one else who might undertake to comply with the conditions and regulations inseparable from the privilege of working mines. The Spanish and Mexican Governments, in granting lands in Mexico, never in terms reserved the minerals contained therein, for the reason that under the constitutional laws they were reserved by and for the government. For this reason, in the many grants of land made by Spanish and Mexican authorities in Sonora, as well as in California, no mention is made of minerals.

Pastoral and mining pursuits were separate branches of industry, and in a certain sense independent of each other. Both were cherished and protected by the government. To the grazier and agriculturist was granted so much of the soil as he had means to occupy and improve, together with such appurtenances thereto as were necessary to make the occupation of the soil possible and the use thereof valuable; and to the miner were granted the minerals he might discover in the soil and the usufruct of the mine in which they were found. But to neither of these parties was the grant unconditional. To the grazier were granted lands on condition that he occupied them usefully to himself and to the government, and the abandonment thereof was followed by a forfeiture of title, in which case the land reverted to the government to be regranted to a more industrious applicant. To the miner was granted the exclusive right to work the mine he might have discovered, on condition that he observe certain rules and regulations established by law and paid to the government a certain portion of the products of the mine; a violation of these conditions was also followed by a forfeiture of such title as he possessed, the usufruct of the mine reverting to the government to be regranted to a more vigilant and "honest miner."

The objects of the government in granting lands for settlement were the increase of the wealth and population of the country, the spread of the holy Catholic faith, and the extension of the power of the Spanish monarchy; and the motive that induced the granting of privileges to miners was that the royal treasury might be supplied with American gold. No grants of lands or mines were ever made by the Government of Spain or Mexico for speculative purposes. It is true that lands were sometimes granted as a reward for distinguished services, but in all other cases on condition of occupation.

From a careful consideration of the foregoing laws and ordinances, as well as of the usages and customs of Spain and Mexico, I am forced to the conclusions:

First. That the grantee of land under the Spanish and Mexican Governments acquired no title to the minerals contained in the granted land.

Second. That the title to the minerals contained in the tract granted remained in the government notwithstanding the grant of the land.

Third. That under the Spanish and Mexican laws and ordinances any one had a right to "dig" in search of minerals, under certain conditions, on his own lands or on those belonging to individuals or private persons.

Fourth. That the Government of the United States under the treaty of 1853 for the purchase of a portion of the territory of Sonora succeeded to all the rights and obligations of the Mexican Government in relation to the ceded territory at the date of the treaty.

The result of these conclusions necessarily is: That since our government succeeded to all the rights and obligations of the Mexican Government in relation to the ceded territory it is bound by the treaty to recognize and confirm all rights, titles, and privileges which had been granted by that government to private individuals prior to the cession of the territory, and to carry out the intentions of the Mexican Government toward those having ownership in lands and mines precisely as if there had been no change of sovereignty.

It is therefore clear to my mind that any one has at present a right to prospect for minerals on such portions of the ceded territory as may have been granted by the Mexican Government to private individuals, and a right to work any mines that may be found on said lands, under no more onerous conditions than the reasonable ones imposed by the mining laws of Mexico. See Article XIV, Title VI, Ordinances May 22d, 1783, heretofore cited.

Testimony of William Ashburner, of San Francisco, Cal.

WILLIAM ASHBURNER, who resides in San Francisco, testified, October 11:

I have lived in San Francisco since 1860; I have been through the Sierra Nevada Mountains a great deal, and am very familiar with them.

Question. Give us a little account of the timber, and the way in which the timber is destroyed.—Answer. The timber on the plains of California and near the coast range of the Sierra Nevada Mountains is very scarce indeed. It consists mostly of oak, of no great value except for fuel. When you reach the foot-hills it becomes larger and there is more of it; as you rise to an altitude of two thousand or twenty-five hundred feet the evergreen sets in, and from until you reach the very summits of the Sierra Nevadas the timber is very thick. On the summits themselves there is a smaller pine, which is of peculiar growth, being almost Alpine in its character. For a range of perhaps thirty or forty miles in width, extending very nearly the whole length of California, is a region very thickly timbered, and it is very valuable. In the neighborhood of towns and settlements the destruction of timber has been enormous, both for the purpose of building and sale. In the lower foot-hills and for mining purposes a great deal of it has been wasted by burning and clearing up agricultural lands. This has occurred in the central portion of California, and also in the northern part as far south as Kern County. They would claim the timber for agricultural purposes, and it would be wasted. I think it would be for the best interest of the government if they should provide for the sale of it at a certain price, allowing the people to buy it for certain purposes. If they wished to use the timber for building or saw-mill purposes, they should have that privilege. No wanton destruction of it should be tolerated, and should be made even a criminal offense; because if the waste goes on for fifty years as it has been during the past twenty-five years it would seriously affect the climate of California. The rain and snow fall in the mountains, even if it was as great as it is now, would be dissipated much more rapidly, and the usefulness of the water would consequently be much impaired.

Q. Can the government dispose of this timber in small quantities to actual settlers?—A. I think men would settle on 160 acres, but not at the present time; but they would before long, because probably in twenty-five or thirty years the timber will be much more valuable than it is now. In the mountains it is being destroyed by fire, and I would put very severe restrictions over its use. The sheepherders go through the mountains, and are very careless in building their fires, which catch in the timber and rage through the mountains for weeks, and I do not know but for months, during the summer, as soon as the woods become dry, and they continue frequently until the rain. Some years ago there was a great deal of difficulty in the great tree groves of Mariposa County. At that time fires annually used to run through these groves. They were started by the sheepherders, and perhaps by the Indians, but that has been stopped without any difficulty. There have not been any fires there for six or seven years. Some little care is exercised by the persons in the neighborhood, but it is very slight indeed; yet it is sufficient to stop the fires. I would recommend that the government make reservations of the big trees and the redwood groves. There are several localities I cannot indicate at this time which are almost inaccessible now for saw-mill purposes. They could be reserved without doing any injury to any parties. They are on government lands. If the destruction of the redwood and big trees is allowed to go for a few years there will be none existing. There are the Calaveras grove, the Mariposa groves, the Fresnel groves, several in the Visalia district (extending over a very extensive area, as much as twenty miles in length). There are several saw-mills in these, cutting the big trees; and, in addition to this, there are several small groups containing a very small number of trees. The Mariposa grove has 365 trees in it. The Visalia grove has several thousand. I would recommend the reservation of all the big-tree groves. The timber in these groves is not very good, the trees are so very old, and if they were destroyed entirely they would never grow again. I would not only recommend the reservation of the big trees, but also the reservation of other species of sequoias. They exist in other places, although I am not familiar enough with the localities to tell off-hand where they are. There are maps, however, in this land office that will show you.

Q. Are not these irrigable lands, which are valuable for agriculture only by irrigation, somewhat extensive? What would you do with them?—A. They are very extensive indeed. In the San Juan country there are thousands of acres that can be made available only by irrigation. I do not feel myself competent to suggest any change of the laws. This question is a very complicated one. I believe the experiments of the Indian government have proven that irrigation works have not been remunerative to those who built them. Whether in this State the State government or general government should build these ditches and sell the water is something I cannot express my opinion about. Individuals are not able to take out the streams for irrigation purposes; it is simply out of the question for them to do it. There is a

great deal of land that by irrigation could be made exceedingly valuable, more valuable than any other land in the State. I have seen that very frequently in Nevada. You know what the general nature of the soil is there. It is a barren wilderness but nearly all of that soil can be made to bloom and blossom like a garden. There are some valuable farms there, which have been made so entirely by irrigation. They produce a very large and valuable crop.

Q. You recognize that there is a large body of land valuable only for pasturage purposes; what system of disposition should the government adopt for these lands?—A. I think they should be sold as ordinary lands. I do not think it is judicious to allow very much holdings on these lands by private individuals unless they pay for them and pay taxes upon them.

Q. How many acres will support a beef?—A. I cannot say. If you could irrigate this land it would take very few acres; but if you cannot irrigate it, it would take a good many more acres to support a beef than it would by irrigation. It seems to me that eight or ten acres would be equivalent to one acre under ordinary circumstances. There is a great deal of difference in different portions of these pasturage lands. I see very large ranches devoted to small bands of cattle all through the State, particularly in the central and southern portions. The grass dries up with the wet immediately after the rain and the cattle then live upon the burr clover. They lick it up from the soil. After the first rain, when the rain drives the seed into the soil again, from that time until the grass grows up again the cattle lead a very precarious existence.

Q. If a man was allowed to select this land would he not control large areas of it by controlling the water?—A. If the pasturage lands were thrown open to settlers the persons who located upon them would secure the streams of water (whatever streams there might be), and thus inevitably control a very much larger portion than they selected. I cannot suggest any remedy for this unless the government will take control of the water courses and springs.

Q. With reference to some comprehensive plan of irrigation, how would it do to survey the land in tracts covering all the water, so as to give the water privileges to the greatest possible number of tracts?—A. That would be best, if it could be done; but would not that under the present law inevitably compel a change in the land system.

Q. It would change the forms and the tracts to be surveyed?—A. You would have the price graded then. I see no objection to that being done provided there was not a uniform price for the land; otherwise a very large amount would remain in the hands of the government indefinitely and never be sold. The pasturage lands, I think, should be sold according to their value, with reference to their producing power and their proximity to water.

Q. In disposing of timber land and pasturage land in the several portions of the country some of it might also be mineral lands. Should the right to prospect and discover mines be abridged and the land sold for pasturage, farming, and other purposes?—A. I think so, sir. I think in California that we have had a very fair chance to prospect the whole State. We have been engaged in that business for twenty-five years; and when land is taken up for agricultural or mining purposes it should be devoted to that only. Persons who have no rights interfere with the rights of another; I should put mining and agricultural rights on the same footing.

Q. Would you not sever the subterranean rights from the surface rights and let the government dispose of the surface rights for pasturage or timbering purposes, reserving the mining land?—A. If you did that, it would be returning to that principle of other governments that all minerals belong to the crown. They are there especially reserved and worked under the authority of the government. If that were done, it would work a complete change in the whole system. Individually, I see a great many advantages in the government reserving rights over the minerals, for the reason that they can control the manner in which it should be worked. Take the Comstock, for instance. It has not been worked very scientifically. The waste of precious metals there has been very great, and this seems to be the case with most of the precious-metal mines in the United States. There are many mines in California that have not been worked judiciously and carefully. They might be producing to-day, had they been worked under some system, whereas they have been abandoned, and probably will remain so for an indefinite time. So far as the government does not claim any right over the mines, I see no reason why a special reservation should be made in favor of the miner. I think at the time that the reservation of the mineral lands was made, which I find was very shortly after the discovery of gold in California, that all lands within five miles of any known mineral belt were reserved for mineral purposes. That I think was very judicious at the time it was done, for the reason that California was not considered to be of any value for agricultural purposes; it was valuable for its mineral only; it was a mining territory. The discovery of gold brought people here, but their only object was mining for gold. That time is now past, and in connection with the mines there are small agricultural settlements in the mountains, and the value of these agricultural places is quite as great for agriculture as they would have been for mines. I think the prohibition on these reserved lands should be removed, and I think they

should be taken up according to the desire of the locator, either as agricultural or mineral lands.

Q. Please give a statement of the facts relating to the Spanish claims in this country which are supposed to arise from their non-settlement. Have you any remedies to suggest for this state of affairs?—A. I have never had any experience with these claims, not being a landholder, and all that I know about them has been learned from personal observation. I have never had any personal experience with them at all. I can merely say that in my opinion they exercise a very injurious influence upon the settlement of California. I wish to say a word in regard to this hydraulic mining. There has been a great deal said in regard to its injurious effect upon the agricultural lands of California and upon the harbors. Undoubtedly the mining streams which flow down into the valleys and which receive the tailings and debris from mines have been filled up, but most of this work was done in the early history of mining in California. The material which is now being washed down in the greatest quantity is very much heavier and consists of very much larger rocks and coarser gravel than the surface dirt which was washed down ten or twelve or twenty years ago; and in my opinion a very large proportion of it remains within a short distance of the mines; but the floods of winter scour the rivers and bring down now, and will continue to bring down for years to come, accumulations of past washings. If we take in consideration the value of the gold produced by direct washing and the value of the land that is being injured, the one is out of all proportion to the other. I consider that the annual production of gold here, from what is known as the hydraulic mining of California, does not average less than $11,000,000 per year, while the amount of land which is being directly injured is very small in comparison to this. Should hydraulic mining in the mountains of California be stopped it would render not less than one hundred thousand people homeless and destroy their means of support as well as destroying eight or nine counties. It is probable that not less than $100,000,000 are invested in hydraulic mining in this State alone. I also consider that the amount of damage done by mines of this kind has been very much exaggerated, and that the effects of the winter rains upon the loose soil on the steep hillsides plays a very important part in helping to fill up the streams which flow through the valleys. Frequently in the winter season I have seen streams on which there is no mining whatever flowing down toward the valleys with the water yellow and almost as thick as cream from the dirt being washed down from the hillsides. I consider that the mud in the streams of the Sacramento and the San Joaquin Valleys is largely due to cultivation of the soil and the removal of the chaparral and grass which naturally cover them. This is especially the case with pasturing, for the streams in the coast range, where there is no mining in the winter season, are always heavily charged with vegetable and mineral matter in suspension. In Fresnal and Napa Counties there are large tracts which have been filled up by means of the ground washing down during the winter season when the torrents are frequent.

Testimony of G. F. Allardt, San Francisco, Cal., on the effect of mining debris on the agricultural lands and navigable waters of California.

To the honorable the United States Land Commissioners:

GENTLEMEN: My name is George F. Allardt. I am a civil and hydraulic engineer by profession; have been actively engaged as such for twenty-six years, and in this State since 1858. My business office is in San Francisco.

For several years past I have made a special study of the subject of mining *débris* and its effect upon the harbors, rivers, and agricultural lands of the State. In 1878 I had occasion to make a reconnaissance of the Bear River country and its hydraulic mines; this year I made a detailed instrumental survey of the Yuba River and its tributaries, extending from its mouth at the city of Marysville up to the head of the hydraulic mining belt in the Sierras. In this connection I have also surveyed and otherwise examined all the hydraulic mines located on the water-shed of the Yuba and depositing their tailings into the same or its tributaries. I am enabled, therefore, to submit a few leading facts and figures relating to this important matter that may tend to disprove many of the random statements and positive misrepresentations that have been made to your honorable committee, either by parties grossly ignorant of the subject or by parties holding large interests in hydraulic mines.

One of your informants states, for example, "that the value of te farming lands destroyed by hydraulic mining, when compared with the value of the mines, is not over 2 per cent.," and in the next sentence he declares "that the *débris* of the mines is, on the whole, beneficial to farming lands."

Now, from accurate surveys made by the State engineer of California, it has been ascertained that over eighteen thousand (18,000) acres of valley land on the Yuba—land that was once the finest bottom land in the State—have been utterly destroyed

and buried beneath the mining *débris*, so that now this vast area has been transformed into a barren desert of sand and slickings, alternating with impenetrable jungles of willow swamps. Probably as much if not more of equally good land has been similarly destroyed on Bear River.

Although these lands have been exposed to sunshine and rain for years they produce not a blade of grass, nothing but willows and kindred semi-aquatic plants that derive their nourishment chiefly from the stratum of water percolating underneath the surface, and not from the soil itself.

This gentleman further says "fully 95 per cent. of the tailings are lodged in the cañons (gorges) or near the mines, and the remaining 5 per cent. finds its way down the lower portions of the mining rivers." The reverse of this percentage would be nearer the truth, would in fact be remarkably near the truth. From the beginning of hydraulic mining down to the present time the enormous aggregate of 162,000,000 of cubic yards of material has been sluiced out of the hydraulic mines into the Yuba and its tributaries, while the amount now retained in the river above the valley, or lodged in the cañons, will not exceed 12,000,000 cubic yards. This we have from actual surveys.

Thus, 150,000,000 cubic yards of solid material have passed the foot-hills and have been deposited on the bottom lands of the Yuba into the waters of the Feather and Sacramento Rivers, the bays of Suisun and San Pablo, and finally into the Bay of San Francisco. (One company alone, the Excelsior Hydraulic Mining Company at Smartsville, admit in a published circular that they have sluiced 1,800,000 cubic yards into the Yuba.)

To present to the mind this enormous mass of 150,000,000 cubic yards of material in a more familiar form, it may be stated that such a mass deposited on a farm of 160 acres would cover it to a depth of 581 feet; or, if spread evenly one foot in depth, would cover 93,000 acres or 145 square miles of land, and absolutely destroy the same for agricultural or any other purposes.

The bed of the Yuba at Marysville is now filled up to the level of the streets of that city, where prior to the era of hydraulic mining there was a well-defined channel of clear water from 20 to 25 feet in depth. The authorities of Marysville have just closed a contract amounting to upwards of $50,000 for raising its levees and protecting the city from the further encroachments of the mining *débris*.

The Feather and Sacramento Rivers have shoaled in a lesser degree, but still sufficiently to almost destroy their usefulness as highways of commerce. A resurvey of Suisun Bay recently made under the direction of the United States Coast Survey Department has developed the fact that tules are now growing at points where fifteen years ago there was several fathoms of water.

The complete filling-up of this bay is a mere question of a few short years, after which San Pablo Bay will become the next settling reservoir, to be followed, finally, by the rapid shoaling of San Francisco Bay, and the eventual destruction of its harbor.

This result is sure to follow, the laws of nature make them enevitable, unless, indeed, hydraulic mining be discontinued or unless some adequate works be constructed for arresting the tailings before they reach the valleys or enter the navigable waters of the State.

On this head our survey has given us sufficient data to warrant the belief that such works are not only feasible, but entirely within the bounds of a reasonable expenditure of money.

Your informant further avers "that of the material deposited in the rivers the farmers contribute 12 and 15 yards where the miners contribute one yard," an assertion so palpably absurd as scarcely to admit of argument. The farming lands of California are exceptionably free from wash, the soil being generally of a resisting and tenacious character with a comparatively level surface. Moreover, nearly all the farming lands adjacent to the rivers actually lie *below* the plane of the present river banks, hence "farming *débris*," if any there be, must run up hill to enter the rivers.

As to the few scattering farms in the foot-hills or on the mountains, their aggregate area is too insignificant to cut a figure in the case. Indeed, I have failed to discover any material wash in any one of them, and I have seen them nearly all in the course of my explorations.

The same may be said of the washings from wagon-roads. One of your informants says, "the cutting of wagon-roads along mountain sides is a fruitful source of sediment, large masses of earth being washed down from them during winter rains." Now, I have traveled hundreds of miles over these mountain roads, observing them closely, but have found no slides or washings originating from them worthy of mention. It is evident that if the roads were subject to slides or washings to any extent they would soon become impassable, while in point of fact they are, almost without exception, in a very fair condition. And tendency to slides or wash is promptly checked by the owners if they are toll-roads, or by the authorities if county roads.

Now, as to the present condition of the Yuba and its hydraulic mines. It is admitted that during the dry season 17,000 miner's inches of water are used daily by the

hydraulic mines of the Yuba, and that such miner's inch removes not less than three cubic yards of material in twenty-four hours. This gives a daily total of 51,000 cubic yards. Fully one-half of this amount is held in suspension by the running waters, and carried down the river in the shape of muddy water, or more correctly speaking, in the shape of *liquid mud*, and is deposited as before stated, partly on the bottom lands of the Yuba and partly in the rivers and bays beyond. That is to say, and I wish to emphasize this fact, 25,000 cubic yards of earth and sand, say 43,750 tons, are daily poured from the mountains into the valleys by the hydraulic miners. To use a familiar illustration, suppose it were required to transport this amount on railroad cars; it would take one hundred and ten trains of forty cars each (one train every thirteen minutes) to accomplish the daily task.

In the rainy season more water is used and correspondently more material is sent down; moreover, the winter freshets invariably clean out the cañons and sweep away the heavier material that has accumulated at the mining dumps during the low stages of the river. The lighter material runs down with the stream, the heavier material rolls along the bottom with varying velocities, depending on the height and volume of the freshets, and in due course of time finds its way to the level reaches of the river in the foot-hills and the valley.

It is estimated on competent authority that there yet remains between the South and Middle Yubas 700,000,000 cubic yards of known gold-bearing gravel deposits. At the present rate of hydraulicing this will be worked out in about forty years. The hydraulic miners contend that it can be worked successfully only by the present hydraulic method. As it is well known, however, that the gold-bearing stratum in these mines, the "pay-streak," as it is called, is usually at the bottom of the deposits, next to the bed-rock, and that the large masses of superincumbent earth seldom, if ever, pay working expenses, it may seem pertinent to inquire just here whether the hydraulic method is really the only and the most economical process and whether the method of *drift mining* would not average more remunerative results. The drift miner, namely, runs his tunnel through and along this pay-streak, and brings to the light the pay-gravel only, from which he extracts the gold in the usual hydraulic way. As all excavations are done by manual labor with pick and shovel, the *débris* arising from that source is necessarily limited in amount. At a liberal estimate the material taken out of all the drift mines on the Yubas will not exceed a half million cubic yards, the greater portion of which being heavy material remains in the dumps at the mouth of the tunnels and never reaches the water-courses.

There are quite a number of so-called drift mines in successful operation in the Yuba belt, some of exceeding richness, notably those on Bald Mountain at Forest City. It is officially reported that the gravel extracted averages over $3 per cubic yard.

Quartz mining is also an industry of growing importance in this section. It consists in exploiting a gold-bearing quartz lode, crushing the quartz in a stamp mill, and obtaining the gold by means of amalgamating pans. One of the largest and most productive quartz mines in the State is the "Sierra Buttes," near Sierra City, on the north fork of the Yuba. Over three hundred men are steadily employed in and about this mine. The tailings from quartz mines are inconsiderable, and their effect upon the flow of the rivers is scarcely appreciable.

It remains to mention still another method of gold mining known as *river mining*, or the reworking of the old tailings in the river-beds. This class of mining is confined almost exclusively to Chinamen; it creates no *débris*, but merely shifts it from place to place, and does not, therefore, enter as a factor in the *débris* problem.

Much weight has been laid by the miners on the importance of hydraulic mining in supporting a large population, alleged to exceed one hundred thousand inhabitants. This figure is undoubtedly exaggerated. According to my observation, the total number of workmen actually employed in the hydraulic mines of the Yubas does not exceed 1,500 all told, three-fourths of which number, probably, are Chinamen, the white men being engaged only for the higher grades of labor. It is but fair to name the Excelsior Mining Company, of Smartsville, as an honorable exception to this custom, all of its employés being white men, most of them men of family.

On the other hand, the number of men employed in the quartz and drift mines is very large, all of them, with few exceptions, being white workmen.

The Sierra Buttes Company, for instance, employs three hundred men; the Derbec Company, near North Bloomfield, about one hundred; the Bald Mountain mines support a community of over eight hundred souls. Grass Valley and Nevada City, with a joint population of some ten thousand, depend almost exclusively on their quartz mining industry.

CONCLUSION.

In this paper I have confined my remarks mainly to the mines in the Yuba belt, yet there are many extensive hydraulic mines in operation on the Feather, Bear, American, and Mokelumne Rivers, all of which are constantly pouring their tailings into those

rivers, thus contributing their quota toward destroying the farming lands and shoaling the navigable waters of the State.

Viewing the whole subject of mining *débris* in its various bearings, and fully recognizing the magnitude of the hydraulic mining industry, and the vast amount of capital invested, yet a candid and impartial observer must necessarily arrive at the following general conclusions:

1st. The process of hydraulic mining is destroying the best agricultural lands of the State.

2d. It is threatening the very existence of the cities of Marysville and Sacramento.

3d. It is rapidly shoaling the navigable waters of the State, and, if continued, will eventually destroy the harbor of San Francisco.

4th. Hydraulic mining, from its very nature, is destructive and ephemeral, and can never become a permanent or desirable industry in any community.

5th. It is chiefly in the hands of rich and powerful corporations who monopolize the water privileges and thereby control all the contiguous mining ground, to the exclusion of the citizen miner of limited means.

6th. As the water is made to perform the principal work of the process, the number of laborers employed can never be large.

7th. Justice to the farming interests, the public safety and welfare, alike demand that in future the hydraulic miners be compelled by law to take care of their tailings by means of dams or settling reservoirs, from which the water will return to its proper channel in a condition of comparative purity.

Respectfully submitted,

G. F. ALLARDT,
Civil and Hydraulic Engineer.

SAN FRANCISCO, *October* 25, 1879.

Testimony of John A. Ball, mechanical engineer and contractor, Oakland, Cal., relative to agricultural and timber lands.

The questions to which the following answers are given will be found on sheet facing page 1.

Answer to questions 1 and 2. John A. Ball; residence, Oakland, Cal.; occupation, mechanical engineer and contractor. I was born in 1831, in New Jersey; removed with my father to Northern Illinois at the age of thirteen years, where my occupation was farming nearly all the time to the year 1862. I was in California in 1850 and 1851. I came to this State the second time in 1862, and have farmed the greater portion of the time in Nevada County until I came to Oakland in 1871.

Question 3. In 1871 I pre-empted 160 acres in Rough and Ready Township, Nevada County, but relinquished my rights to another party before perfecting title.

Question 4. My living, a farmer, in Northern Illinois and in Nevada County, in this State, at the periods above named has afforded me many opportunities for learning the practical workings of the public-land laws.

Question 6. Yes. The desert-land act and pre-emption laws should be abolished. No one should obtain public lands by any other way than by homestead entry.

There are several enactments of this State's legislature relating to swamp, overflowed, and tide lands—*lands under water*—that the general government should, by prompt action, put an end to.

Lands that are covered by water at *ordinary low tide*—navigable natural channels of water—and the lakes should not pass into private ownership, but should be the government's property, and under its control.

If there are any enactments by the United States that have caused a surrender or have ceded to any State any such lands they ought to be abolished, and Congress ought to, by its authority, make all such State acts null and void.

My reasons are that by individuals or incorporate companies owning any *natural navigable channels, harbors,* or *water fronts* of any city or town prevents the government from making improvements essential for the commercial interests of the country. The present state of affairs in regard to the Oakland Harbor is an example of the evils produced.

If said lands, under water, are not owned and controlled by the government there is danger of the government being embarrassed when engaged in defense in time of war.

I refer you to a map of the bays of San Pablo, San Francisco, and tributaries, published by the State board of harbor commissioners.

Question 7. In answer to questions with regard to the county in which I reside I refer to Nevada County, in this State, where I have formerly resided. The county is mountainous, lying on the western slope of the Sierra Nevada Mountains, extending from the summit into the *foot-hills*, nearly to the great valley of the Sacramento.

There are several valleys in the county of considerable size that are fertile, and very many small valleys, especially in the foot-hills—I mean the lands that are below about three thousand feet altitude. Except it be limited to a few small spots the whole county is mineral land—placer, deep gravel, and quartz mines. The quartz mines are principally gold. There are some paying copper mines near the western or lower boundary of the county. The whole county, except small spots of *bald hills* and some portions of the valley lands, are timbered.

The timber on the foot-hills is principally oak, with some *nut-pine.* The latter increases in proportion as the altitude is greater, until at about twenty-five hundred feet the oak and nut-pine begin to give place to heavier forests of yellow or Norway and sugar pine, spruce, balsam, &c., and at an altitude of about four to eight thousand feet the growth of timber is the heaviest, with considerable black-oak in some places.

A great deal of the timber has been felled and used for lumber and fuel for the mines and mining towns and the adjacent portions of the Sacramento Valley farms.

More than half of the county is adapted to agriculture. The soil in the valleys is very productive for cereals and vegetables. The latter requires irrigation, but the former does not, not even on the hill lands. The soil on the hills is generally light.

Fruits and vines flourish exceeding well where thoroughly cultivated, without irrigation in nearly the whole county wherever a plowshare can find a sufficient amount of earth for their support.

The *rainfall* is generally abundant in winter from the 1st of November to the 15th of April. The county ranks as first of importance as a mining county, and always has from the early days of mining in this State.

Questions 8 and 9. Some lands are valuable for and adapted to either agriculture, horticulture, grazing, timber, or mining purposes, and others are only adapted to one industry.

The present occupants (I mean the farmers) are seldom utilizing these lands to the uses they are, *by nature,* the best adapted.

When our State shall have nearly attained its full growth in development, we may expect advancements in the facilities for and systems that will bring about transportation and fares to rates so as to accommodate the warranted demands of every locality. We must expect these changes to take place gradually and to require considerable time.

I think that the miner should be allowed to prospect or mine on any lands in the country, but should pay for all damages to the occupants before him, before he occasions any damages.

After lands have been occupied for mining purposes and abandoned they should be open to the homestead settler, and he should also be allowed to take up timber lands that have been "skinned" and abandoned or unoccupied.

Question 10. So far as disposing of the public lands by the government require it, I think there is no need of any classification of the lands in the State or the United States except it be to class them as either *valley or mountain land.*

The government should not dispose of any lands in large tracts to individuals or incorporations for grazing or other purposes, for the reason that nearly all of the lands—including the *desert lands*—that can be irrigated would be more valuable when highly cultivated by the aid of irrigation. It is only a question of time what systems shall be in vogue; whether the owners of small or moderate-sized farms shall till the lands in a manner similar to that of the settling of the Western Atlantic States, bringing the best results to our *social and political* welfare, and insuring universal contentment, or whether large land owners shall hold and only half utilize large tracts, hiring the cheapest labor, thus causing the majority of our population to be hirelings degraded to a level with the slave.

Suppose there is no other way of entering save by the homestead entry of 80 to 160 acres of valley lands or 160 or 320 acres of mountain lands; to allow each county, or the State, to regulate the privileges of grazing on the *public domain* or common. By common I mean land unfenced and untilled, whether owned by the government or other parties.

The grazing man enters his homestead for his home, does not say whether it is for grazing or what use in particular, and by the local laws he may control adjoining lands for grazing; but his possession shall not debar other men from entering homesteads on the same, except one homestead shall not lap one over the other.

The homestead settler to occupy the land as a *bona-fide* home for ten years before he shall be entitled to a clear title.

I would rather the government to own the land *perpetually,* and the homesteader to have control and full use of it so long as he lives upon it as his home, and to be allowed to enter lands as a homestead as many different times in his lifetime as he chooses. His being required to occupy the land of a specified amount before he can make an entry provides there shall not be any confusion caused by his having more than one entry.

The man who has a homestead can relinquish his rights to any one at any time, but the second party shall show proofs to such effect, or that the land is unoccupied, before the government grants the second homestead on the same land more than once.

Questions 1 and 2, relating to agriculture. To describe the climate of our State would require a volume of writing, it is so varied in different localities, even within short distances. We have as desirable and as pleasant a climate in California as there is in the world.

The annual rainfall in some parts of the *valleys* there is scarcely anything, perhaps four or five inches, and in some parts of the mountains the rainfall is seventy-five inches and often more.

In the greater part of the State that is most inhabitable the seasons are a perpetual summer. The rains fall in the valleys in winter; the snow seldom whitens the ground. In the higher mountains it seldom rains, but the snow falls to a great depth. In this way *nature* has provided an abundance of water for all purposes for nearly the entire State; but it requires the aid of *man* to properly *engineer* and carry out a plan for a *general* system of reservoirs, and canals for irrigation, transportation, reclamation, manufacturing purposes, and the supplying of water for the cities and towns.

Fifteen years ago I supposed that before this present time that a general system by the government would have been farther advanced than it is. The large land owners (individuals and incorporate companies) have fought all legislation on the subject of a general system, and in fact all schemes of irrigation except where they have an individual interest to monopolize the water and the land in large tracts. Irrigation companies, formed of small or moderate land owners, are almost always hindered by the large monopolists in the lands or in the water rights.

The snow is falling in the mountains in winter season within plain view of the farmer while he is plowing and planting in the valleys, and that, too, while the weather to him is generally clear and pleasant as summer.

There is only a small portion of the farming lands in the *great valleys* that produce a full crop with certainty every year. For want of sufficient rain in winter the crops always fail partially or entirely. Annually, in spring and the early summer months, the water that has been stored in the mountains in the form of snow, as it melts comes down the natural channels through the valleys on its way to the ocean, causing long-continued freshets just when crops most need it but does not now benefit them.

Often the crops along the streams are destroyed by floods in harvest time, and at the same time the crops on the plain or valley lands are scorched up by drought to the very edge of the water that is thus allowed to pass by unutilized, whereby the *whole land* should be made to bloom the whole year round, producing immense crops once, twice, or three times a year.

I favor a general system of canals, under direction and control of the government, in all the States and Territories where irrigation and reclamation is necessary.

When I speak of the government providing and carrying out the system of canals I mean the main canals and reservoirs, but not the distributing ditches. I approve that the government should bear the burden of providing and executing such a system of canals in order to place the lands under the best possible condition to be reached by the occupancy of the tillers of the lands themselves. But rather than the present course to run any longer I would say let the government devise some plan whereby a return shall be had for the necessary outlay incurred by moderate taxation upon the products of the land, each acre at its just ratio.

Lands owned by other parties than the government should be, by special laws, taxed to bear their proportion.

The water to be free to all, and under control of the government, except each district elect its officers for distributing and allotting to each consumer.

There is an abundant supply of water if properly stored, as the surface of the country provides many sites for reservoirs.

Question 6. Throughout the State, where wheat is a common crop, if it be properly planted twenty to thirty inches of rainfall during winter will insure a crop; but if the land is plowed deep two or three times for each crop, much less water is required. Twice plowing is the best practice to remunerate the farmer for his labor.

If water is flooded over the ground repeatedly without the soil being stirred to loosen it, while in proper condition after being irrigated, the soil settles and bakes by the heat of the sun, and therefore the land is seriously injured. But if properly pulverized after each irrigation, when the soil is not too wet the process will tend to enrich the land, because it decays the vegetable material that is mixed with the soil, and also other substances to decay, especially where, in some localities, the soils have never been thoroughly wetted by the rains—for example, the desert lands of Kern County. In the localities where fruits and vines thrive well they should not be irrigated in summer. If the ground is once well saturated with water in the winter by the *proper stirring* and keeping the weeds from growing, to prevent their taking the moisture from the soil, leaving it loosened deep, it will retain sufficient moisture *all through the dry season.*

The fruits are far better in flavor, and as well developed as can be raised.

Question 9. As the ditches are now managed it is very wasteful and unsatisfactory to those using the water. No systematic regulations in regard to waste.

Questions 10 and 11. About two-thirds of the streams leading into the *great valleys* of the State are taken up, so that late in the dry season the canals are not more than half filled. But for eight or nine months out of the twelve the canals do not take all the water that flows down the natural channels.

The annual percentage of water taken up by the canals is small compared with the whole amount shed from the Sierra Nevada Mountains.

The present system of taking the water by individuals and companies causes numerous conflicts. They all seek their own individual or local interests. Strife and contention is the rule under the present system.

Question 14. As homesteads only, as before stated.

Question 15. Up to the present time the *foot-hills* are principally occupied for grazing, and are the most valuable for such use of any lands in the State, but as the country advances the present occupants, or others in their stead, will use the lands for the purposes to which they are best adapted—for the vines and fruit trees. Then the stock-grazing would appear insignificant.

Question 16. There are no families or occupants in the foot-hills that depend solely upon stock-raising for their support. Generally they cultivate small or larger tracts of the valleys or hills and graze the adjoining hills. They raise vegetables, fruits, &c., for their own use, and often to sell, and generally hay and other feed for their stock in winter. The storms are severe, often cold rains and snow, the latter lying on the ground sometimes several days. It certainly is *cruelty to animals* to wholly depend on the range for their stock to subsist upon.

Questions 17 and 18. Perhaps twenty or twenty-five head. If the cattle had the range to themselves exclusive of other stock a square mile would not support more than thirty head. The grasses have diminished in consequence of being overstocked. The wild oats and some other varieties of grasses have nearly disappeared.

Question 19. They seldom fence their ranges. Stock can be safely kept inside of *good* fences on the ranges, and there is generally an abundance of material to make the fences on the land, but it will not pay the *large stock* man to keep up good fences for the range only.

Question 21. Springs only.

Question 23. A few sheep will diminish the feed so cattle will not do well on the same range.

Question 25. There are many conflicts. Generally the local laws do not allow sheep to be a *free commoner*.

Question 26. I think the large herds comprise about one-half of the amount of stock in the county.

Question 2, relating to timber. None planted except for ornamental use, &c.

Questions 3 and 4. The heavy timbered lands are chiefly in the higher mountains, and are valuable for lumber, which, to make it remunerative to any one, must be transported long distances to find a market.

These lands perhaps might better be classed as *milling timber lands*, and the timber be sold to those who will make lumber of it and supply the market. But the timber ought to sell at a higher price than five or ten dollars per acre; the timber to be sold, not the land; the purchaser to have possession only sufficient time specified for him to cut the timber, and then vacate the premises.

My object in advancing this idea is to preserve some of the timber that is the most valuable, for future generations. Some of the trees in these forests were standing just where they do now, but were smaller, when our Saviour was on this earth. It is wrong, I think, to encourage any system that might cause men to make oath to settle upon those lands for a home, when in reality his desire is to aid some rich man or company to obtain the privilege to cut the timber without its costing anything.

Questions 5 to 7. The second growth of timber is very rapid. The pines, cedar, spruce, &c., come only from the seed, which seem to be plentiful when the large trees have been taken off the land. They spring up thickly together, and soon make valuable timber for common lumber, fuel, &c., but not of the quality of those that have had a growth of two thousand years.

Penalties should be enforced for wasting the timber or for depredations on the timber lands, but windfalls and deadwood should be free to any one.

Question 9. Penalties could be more efficiently executed if under the care of the government.

I will write some suggestions with reference to mining on the government and other lands as soon as convenient.

Respectfully,

JOHN A. BALL.

NOTE.—The writer of the foregoing remarks having long since been awakened to the importance of a general system of irrigation has been prompted to devote the last thirteen years of his life to endeavor to introduce *steam* machinery for excavating and dredging, the results of which are to some extent known.

J. A. BALL.

OAKLAND, *October* 18, 1879.

Testimony of Aaron Bell, late register of Shasta land office, California, relative to agricultural, mineral, and timber lands, and irrigation.

Mr. AARON BELL, late register of Shasta land office, testified as follows, October 2, 1879:

I have been in the United States Land Office ten years and over, and register of this office for six years past, until within a month or two, resigning the office to accept a position on the bench. The general character of the unsold public lands in this land district would be mountainous timber land, with some good agricultural land, what you would call second and third grade agricultural lands. I would say that there was one-fourth of it agricultural land. These agricultural lands are adapted to the raising of anything that is raised in this climate, as wheat, barley, oats, hay, fruit, and vegetables. The lands in this northern country are extra lands for wine culture. It is very good also for cereals. Wheat would average twenty bushels to the acre, annual crops. We do not have to resort to irrigation except for vegetables. The average rainfall this year was about eighty-four inches. Last year there was ninety-six inches and over. That would not be so all over the district. There is a greater rainfall in this place than there is probably in any other section of the State. Some valleys in this district will raise more wheat than is stated above. For the purpose of irrigating vegetables, water is obtained out of torrent streams. There is but little difficulty arising out of the adjustment of water rights. The laws of this State generally regulate the supply of water. In order to obtain a water right in this State, it is requisite that a person shall post a notice at the intended place of diversion, and in that notice he must state where and for what he is going to use the water, and the size of the ditch, which is measured under a four-inch pressure, miner's measure; and he is required to commence work on the ditch within sixty days from the time of posting the notice, and also required within ten days from the time of posting the notice to record a copy of it in the county recorder's office for the county in which the water right is situated. He must then, within sixty days, commence work on the ditch and work continuously until completion, except he be interfered with by deep snows. These things give him a right to the use of the water against all other parties.

Question. The unlimited right?—Answer. Yes, sir; against every person excepting the United States.

Q. Can he take it in any quantity that ditch will flow and use it for any purpose?—A. Yes, sir; if he is the first locator he can. He must make the use of it that he stated in his notice. When he ceases to use it the right ceases, but he can use it at his own discretion. The oldest location carries with it a right to take as much for actual use as the locator sees fit. In other words, he has the exclusive right to whatever water his ditch will flow. He cannot enlarge that ditch afterward, as against subsequent parties. If there is not water enough to furnish that first man with water for artificial purposes, as against the second person wanting it for natural purposes, he can use all the water his ditch will carry. The use indicated is not necessarily accompanied by the ownership of the land. It would be possible for a party, under the State law, to take up the whole stream without acquiring any land, and deprive any person purchasing land from the United States of its use without himself owning any land. There are some considerable bodies of public land in this district which are rendered useless to purchasers unless water privileges are purchased from the owners of ditches. About one-third, if not more, of the lands remaining unsold in this district are what I would call timber lands, and about nine-tenths of the land in this district is still unsold. It is mostly mountainous land that is not fit for any purpose or use. Some might be used for the purpose of pasturage but a great deal would be of no use whatever, being rocky and barren, having neither timber nor grass upon it. Nearly one-fourth of the land unsold would be in this condition. About one-tenth, or very nearly one-tenth, of the lands in this district are non-mineral in character.

Q. How large a part of the district has been reserved, by withdrawals, for mineral purposes?—*A. I cannot say any of it has been withdrawn for mineral purposes in this district.*

Q. Does not this fall within the general belt of reservations made for mining purposes, as designated, which would put the onus of proof upon an agricultural applicant?—A. That is so as regards the whole district. Applicants for agricultural claims are required to file an affidavit of the non-mineral character of the land.

My experience in connection with the administration of the land laws leads me to the opinion that at the present time the existing land system is not the best that could be adopted as regards this State, in the matter of restricting sales to agricultural settlers in one-hundred-and-sixty-acre tracts, for the reason that the better portion of agricultural lands have already been taken up and the remainder that are agricultural in character are of a second and third grade, and a great deal would be classed perhaps as more valuable for grazing purposes than any other. For grazing purposes one hundred and sixty acres of land is not enough. That amount would be totally inadequate.

Q. Under a system that purports to extend 160 acres only to a settler, how many different claims can a man in fact get?—A. He can get a homestead of 160 acres and a pre-emption of 160 acres more. There is but little land in this district that could be taken up under the timber culture act, because land destitute of timber would be hard to find. I do not know of any desert land. As regards additional homesteads a man may locate them without restriction, and so with Sioux and Valentine scrip. So that in fact, under the present law, there is no bounds (except a money availability) to the amount of land a man may acquire. I think it would be best if the government should take away the restriction as to the amount of land and the whole land in this district should be reduced to one dollar and a quarter per acre. The lands actually valuable have been bought up at $1.25. I think a system of putting the land up at a fair valuation would work more advantageously to the poor man than the present one does. Under the present system a poor man can only acquire 160 acres, while a rich man may acquire as much as he pleases. Up to the present time I think about one-third of the filings made in this office or a little over that number have been consummated. A great many of the balance have been abandoned. Unless it was the intention of the government to give settlers the right to take more than one claim, or 320 acres of land, I do not think that there would be any occasion for both the homestead and pre-emption law to remain in operation. Were one abolished, and the amount of land represented by both given by the remaining one, it would be better for the settler.

Q. Were any of the lands in this district offered at public sale; and, if so, at what time and in what proportion?—A. They were offered from 1859 up to 1867, and there is now a little offered land remaining unsold. The lands sold since this office was opened have been in very small quantities. I do not know that we have sold over 320 acres to any one person, but there were entries made here before this office was open, by parties, in large quantities. I am of the opinion that a system of private entry would not tend to create a monopoly of lands—at least such as are in this district.

I do not know of any special benefits to be obtained by the present law requiring settlers to advertise in newspapers. I think it puts them to some trouble and expense without any corresponding good to the settler or to anybody else. They have to pay the printer for the publication, and the whole expense of advertising the public lands has ranged from three to ten dollars. My idea is it is an imposition of an expense without corresponding benefit.

As regards the cancellation of a homestead entry, I could never see any necessity for sending the case away from the local officers, who generally have the whole matter before them and understand it fully, when it is canceled; that is, unless there is a contest. The present system tends to speculative frauds, and the parties who initiate an attack upon an abandoned homestead do not always get the homestead; other parties frequently step in and get the benefit of it. I think the law should give the person who makes the application to have the homestead canceled the privilege of making the entry for, say, ninety days. If it is necessary that it should be passed upon at Washington, his application could be received subject to the cancellation, and the application dated back.

A great many of the mineral lands here are placer and lode, the greater portion being placer. It is deep gravel mining—principally deep hydraulic mining. They have some difficulty in hydraulic mining as regards dumpage, by reason of running the tailings on other people's land. Those difficulties are generally settled in court, and the courts here generally give the parties the right to an outlet and the right to dump tailings on the land of another, if they are satisfied they could not utilize the mine without such right, by paying whatever damage they may do. Most of the dumpage of tailings is on lands totally inadequate to cultivation, but not having mineral under them they are only subject to agricultural entry. Some provision should be made in this State for selling agricultural lands. It would greatly facilitate the sale of placer mines. I know of cases where there have been suits between the agriculturists and mineral men arising out of this kind of difficulty. Sometimes the tailings are run on quite good agricultural lands. As regards the interval between the dumpage and the mine—where the agriculturist takes up the land—it is generally done to blackmail the mine; but I do not know of any such in this district.

I think that it will be better to abolish the local customs and rules under which miners commence their titles, because there often is a different custom and rule in different places. Take the records of a given district—at one time they have all been written out, but they have become lost or destroyed, and one can hardly know what they are, and the local records should all be abolished. The districts are all the way from a mile to six miles square, just as the miners happen to take the notice; so that, under the present local laws and regulations, it is possible for a space of six miles square to be subjected to a new system of laws adopted arbitrarily by men to subserve their own purposes. There is no guarantee for the security of the records kept by the recorder. There is no provision in this State for the transfer of the custody in case of his death or departure, and no security against their destruction or manipulation;

and yet, under the present system, the United States has to accept any certified copy of that record as the whole foundation of a claim, which I think is a great absurdity; and in my judgment the whole thing should be transferred to the United States and let the parties commence there in the first instance. It would be best, and avoid unnecessary conflict between miners, to require them to commence with an official survey in the first instance, so as to avoid any overlapping of mines, though there should be some provision to make them as little expensive as possible. It would be well to provide by statute what the cost of survey should be. The usual expense of a survey now varies according to what a man sees fit to charge. It runs from twenty to forty, and even to sixty dollars.

In cases of controversy arising between claimants to land or mineral claims, I think they should be adjusted by the Land Department. It would be a proper place and a great deal less expensive to parties, and nine out of ten would prefer it. I have no idea of the period of time it takes for the courts to settle such controversies, though I know of some who have been in the courts for the last six months and no decision reached yet. It is quite costly to many, much more so than it would be to contest a case in the Land Office. The jurors who pass upon a case are likely to have their views in the matter—the district court here, for instance; the only thing they decide is as to the right of possession. In fact I have known cases to be tried when I knew that neither one of the parties had complied with the United States land laws in locating their claims or in working them, and the courts will decide such a one is entitled to possession, and he comes in and files the judgment of the court and gets a patent without complying with the regulations and the laws at all. If the same party had undertaken to come here and make proof that he had complied with the law, he could not have done it.

Q. Do or do you not see any reason, Mr. Bell, why the mineral lands should not generally be sold in the same manner as agricultural lands, in sectional tracts?—A. I know of none. I think it would tend to prevent litigation and render mining very secure.

Q. Are there any mines in this district that would be imperiled by restricting them to their side lines, provided you gave them sufficient tract to protect them in ordinary deep mining?—A. I know of none. Deep mining has not progressed here very far. I do not suppose there is a mine in this district being worked that is one hundred feet down on the vein, and even under the present law twenty-one acres would protect them for an indefinite period. There is often much hostility between lode claims where they cross each other, as they often do in various directions. The angle at which a lode dips in this district varies considerably. They have no uniform dip. There are no flat lodes; I think all are true fissure veins.

Q. What is your opinion as to the applicability of the timber laws to the public uses and to governmental interests in the future?—A. I think this act for the sale of timber lands is a very good one. However, they have never taken advantage of it in this district. I do not consider the law inopportune unless for a man who is engaged in the timber business, and in that case he should be allowed to purchase more than one hundred and sixty acres. That is the only objection I have to that law. There is no doubt that this law by giving permission to cut timber for purposes of mining, domestic, and agricultural uses tends to create an unlimited trespass under the color of law. There are no means of determining the character of the lands except by unsupported evidence. These things have been called to our attention, but we could not tell whether it was mineral or not, and without proper complaint to us we can take no notice of it.

If the effort was made to enforce the law for trespassing upon mineral lands, I think, as a general thing, the effort would substantially fail; either by reason of the infirmities of the law or by lack of public sympathy. As a general rule the efforts on the part of public officers to enforce that law would be inoperative.

I think the timber lands would be better protected if they were reduced to private ownership. I am satisfied there would be less waste and destruction. In this country fires are set and destroy much timber. It is hard to tell how they originate. They destroy thousands of acres of timber lands, and no one feels interested in trying to stop them. This summer I traveled over a place where miles of timber had been destroyed by fire. I do not know how long it takes timber to reproduce itself in this section. The timber is generally pine; some sugar-pine and white and yellow and spruce pine, and some fir. There have been large bodies of these timber lands taken up by additional homestead entries in this district, and also by the agricultural college act of this State. Titles to many of these locations have been secured by patent under the homestead right, but under the agricultural college act I do not know that any have been secured.

Q. What would you think of reserving alternate sections of valuable timber to the United States and selling the timber on the others, reserving all title to the soil?—A. I think that would work; but, as a general thing, the land here is not worth much after the timber is taken off. It might be valuable to the government to reserve it

for the protection of growing timber upon the same land. I think a person would get as much for the timber as he would for the timber and land. The mines are usually located among the timber. It would therefore be necessary sometimes to insert a reservation of the mineral, even though the land were sold; otherwise you would be disposing of the mineral lands while selling the timber. In other words, reserve the right for miners to prospect and develop the lands the same as now. There is no doubt but what there is a great deal of land that people would want only for the timber, and would pay as much for the timber as for both the wood and land. The timber in this district is generally marketed at Red Bluff, carried there by flumes, and I think at Tahama and Chico, and it is generally shipped from there by railroad.

Q. Can you suggest any ways in which the administration of the settlement laws can be made any more economical and expeditious for the benefit of settlers, either by the new law or a modification of the present system?—A. I think the buyer could be more readily accommodated by selling the land at private entry, or a portion of it at least. If they were sold at private entry they might select the amount for themselves to prevent their getting into the hands of monopolies, though in this district it has not generally had that effect where large bodies of land were sold. I do not think that idea of monopoly is a practical danger. If a person sought lands for speculative purposes he would almost at once seek customers, and would be more active even than the government would be. My opinion is, taking into consideration the lands in this district, that there would be no danger in throwing them open to private entry. I think it would be a good thing, and I think that the price should be reduced to $1.25 uniformly. At present the price of $2.50 per acre is too much. The land is not worth that. The bulk of lands in this district, forty miles wide, are within railroad limits, and are only subject to entry at $2.50, the even sections. I think it would tend to the more speedy development of the public lands if the government could make arrangements with the railroad companies to take the land on one side of their roads, or aggregate the lands on each side into alternate blocks. It is often the case now that a party does not buy the government section because he does not know at what price he can buy the railroad lands adjoining. A system of alternate sections between the Government and the railroad tends to prevent the sale of lands rather than to facilitate their disposition. It would be much better for the railroad and for the government to each get their lands in a body.

I would suggest the following: There are great masses of lands in this district and other districts in the State in which there are some mineral. Some portions of these lands might be more valuable for agricultural than for mineral purposes, but it is all returned as mineral land. I think such land should be disposed of to the settler without requiring proof of its character, and let him do with it what he pleases. The settlers are often put to great cost and expense in disproving the alleged mineral character of lands they desire to possess, and I believe they should be allowed to pre-empt a homestead, or purchase it without inquiry being made whether it was mineral or not in character. I think it would be better for the government, either when it surveys the land or in some other practical manner, to classify it and afterward to stand by the classification, although it might not be right. It would still be better for the government interest and cheaper for the settler.

Q. Under the present system, do you, in point of fact, pay any attention to the classification made by the surveyors?—A. Yes, sir. For instance, they return a townsl ip as mineral land. A homestead applicant comes in to make an entry, and we do not allow him to make it until he disproves the mineral character of the land. As a matter of fact, we allow the surveyor's official report to be put on trial at the instance of any person who attacks it, although the surveyor is sworn to the correctness of it; it only throws the proof on the other side. Under the present law, I do not know how a classification established by law upon reports that were not proven to be fraudulent would work, but I think it would be beneficial as a general thing. The lands here are put upon the market at $2.50 per acre, which is the same price that we ask for mineral lands for placer mines, and I never could see any good reason for putting the settler to the expense of disproving the mineral character of the land when he has to pay the same price for it as though he was buying it for the mineral. I think that part of it should be abolished.

Q. In your judgment, would or would it not be well to cut off these possessory mining titles and fix some limit of time within which claimants must consummate their titles?—A. I would say that when a mining claimant makes his application there should be a time set within which he could make his final proof and payment for the claim. As it is now, he makes his application, which withdraws that land from sale or entry, and never pays for it, perhaps. There are many such cases on file in this office now, and perhaps the lands involved in them will never be paid for.

As regards placer mining, I would make a rule that where a man works a claim continuously he should be required to pay up within a reasonable time, but where the claim is of little or no value they should not be required to acquire title of the United States at once. The government price for the land is a small price, and I think a man

should pay for it; and while there should be some limit to the time a man may work a mine without paying for it, and the government should be liberal to him in the way of time, just as they do in pre-emption and homestead cases, he should not be allowed to keep the land for any considerable time without compensating the government. I think it would be well if a new law was introduced to fix some limit of time within which all these old claims should be consummated or else wiped out, or some similar arrangement made.

Q. Is it very expensive to mineral claimants under the present system of making out their abstracts of title?—A. I think it is; and I think it could be simplified in some way. So far as filing their abstracts of title is concerned, I never could see, for my part, the necessity of doing that. For instance, a party comes in and makes an application, and the names of claimants are set forth in that. In adverse claims, parties are required to come in and file their adverse claims within a certain time. If no adverse claims were filed, and the parties desired to push the matter to conclusion, the idea would be to allow them to made the entry without going to the expense of making up their showing. That publication, without conflict on the part of others, should be sufficient evidence of their possession of a mine.

Testimony of C Bielawski, draughtsman in United States surveyor-general's office, San Francisco, Cal., relative to surveying the public lands.

UNITED STATES SURVEYOR-GENERAL'S OFFICE,
San Francisco, Cal., October 17, 1879.

Honorable Public Land Commission appointed by act of Congress approved March 3, 1879:

GENTLEMEN: Having been asked by you for my opinion about the system used heretofore of surveying the public lands, and for some suggestions for improving the same, I beg to state:

1st. That the present rectangular system, if faithfully executed in accordance with surveying instructions, is the best and most economical one to prepare vast and sparsely populated lands for settlement. This system has been tried for a long period of time, and the simplicity of its construction, as well as the practical way in which it exhibits the boundaries of the lands subdivided, made it so familiar and I may say so useful to our people, that it has become a part of their elementary education.

2d. If this system is faithfully executed, the four miles bounding every square mile will be found so well blazed, when passing through wooded wilderness, in all cases so well marked every half mile by substantial and prominent corners, and their topography as well as the quality of the land generally so well described, that everybody in search of a new home, and provided with a few notes obtainable at the land offices, can easily follow the same, and in such a way find out by himself which parcel of land will best suit his purposes.

3d. To require more extended topographical details in the survey and a more scientific research about the quality of the soil and other resources of the land than the present system prescribes, would double or even treble the expenses of the same without any remunerating practical results for the settler.

And besides that, I am of the opinion that minute topographical surveys and other scientific researches, except along the coast for navigation purposes, should not be made by the United States in the subdivision of public lands; and that they should properly be executed by the people of the State in which these lands are situated.

As soon as a State becomes sufficiently populated, it certainly will not omit to develop its resources and institute geological surveys, irrigation schemes, and settle *débris*, questions, as California is trying to do now; and its counties will gladly pay for accurate topographical maps and a true classification of the land for the sake of a just taxation.

4th. All the United States should do in leading the way of progress is to spread over the whole country a system of large trigonometrical triangles, the points of which, carefully determined as to latitude and longitude, should be permanently established on prominent landmarks, and their position and description communicated to the respective surveyor-generals.

This triangulation system, I believe now partially in process of execution, combined with a general scientific research, will form a substantial basis to connect the public surveys with and to correct the unavoidable geographical errors made in the latter.

5th. Having thus expressed my opinion about the merits of the present rectangular system of surveying, I now come to answer the question asked me:

Which way I thought best to execute the same, by salaried surveyors or by surveyors under contract?

My answer is, by surveyors under contract, controlled in the execution of their field-

work by examiners of surveys. These examiners should be appointed and paid in such a way that they can fulfill their duty independently of all outside influences, and should be selected from experienced *public-land* surveyors of well-known ability and integrity.

The main reason why I prefer the surveys to be executed under contract is that they will cost half or two-thirds less than those made by salaried deputies.

The salaried deputy must be paid the whole year around if employed in the field or not. The cost of the outfit of his party, of surveying instruments, assistants' wages, board and traveling expenses, repairs, &c., will amount to a great deal more than the price paid to the same deputy for the same amount of work done as a contractor. As such he will use the greatest economy in his expenses, push the survey ahead with all energy, and finish it in a great deal less time than when acting under a salary.

There is another reason why I prefer the contract system, and this is that it can happen that some of the salaried deputies are found out as unfit for the place and that their surveys are proven to be as erroneous as those of some deputy contractors. What other remedy remains but to dismiss the salaried deputy and appoint somebody else to do work over again? Whereas the bad work of the contractor will not be certified as being correct by the examiner, and therefore not approved and not paid for.

6th. It cannot be denied that some of the surveys made in this State are defective; but in justice to many of the deputy surveyors in California, whose contract surveys I examined and platted since 1854 to the present time, I must add here that a considerable portion of their work executed at that early date in several parts of this State still exists, and witnesses to the faithful performance of their work, although made under such imperfect control as was practiced then; and as it also must be acknowledged that the later surveys were executed in a far better way than the earlier ones. I do not see any necessity to recommend changes or improvements in the establishment of corner monuments. Those set in strict accordance to the surveying instructions will last many years if not destroyed by mischief.

7th. I think that from two thousand to three thousand townships have been surveyed in California, many of which are fractional. Of this number about two-thirds are settled upon, some only partially.

8th. To my knowledge some of the Mexican grants in this State have been, on a second survey, largely increased in size. I do not know the reason why.

9th. I believe that only a few Mexican grants remain unsurveyed; but there are more not patented yet. All these cases should be promptly settled in order to finish the everlasting disputes about land titles, the uncertainty of which disturbs the progress of our State.

10th. As to the prices paid by the government to contractors for surveys, there are higher and lower ones for the same kind of surveys made on different ground. In the mountainous, heavily timbered, and brushy parts of the State the prices are $16 for standards and meridians, $14 for township, and $10 for section lines. In open valleys and rolling, open hills the same lines are paid $10, $7, and $6. It is my opinion that even the highest prices are too small a compensation for the faithful survey of the part of the State yet to be surveyed. This is mostly mountain land broken by precipitous cañons, but containing many fine valleys, inviting settlements, excellent grazing lands, and very large tracts of valuable timber. Appropriations for surveys are small; and as the number of surveyors seeking contracts is increasing every year, the consequence is that only small contracts can be given out, in the execution of which the contractor is subject to heavy expenses in preparing his outfit and paying his assistants, while the rough character of the country he has to penetrate and survey obliges him to make but a very slow progress in his work.

11th. There is one more point to which I wish to call the attention of the honorable Public Land Commission, and this is the office of the United States surveyor-general of California. Please to get a good insight into the amount of work performed in this office, and ask how much work is left undone for want of clerical force; and I am certain that you will join me in the conclusion that the slow progress in the settlement of many kinds of surveys, of which California justly complains, cannot be attributed to want of industry and zeal of the clerical force of this office, but solely to insufficient appropriations made by Congress for the same.

I remain, respectfully, your obedient servant,

C. BIELAWSKI,
Draughtsman in United States Surveyor-General's Office.

Testimony of John Boggs, of Colusa, taken at San Francisco, Cal., relative to classification of the public lands, timber, and irrigable lands, water rights, pastoral and mineral lands.

JOHN BOGGS, of Colusa, Cal., testified at San Francisco, October 10, as follows:

I have lived in the State a little over thirty years. I have been engaged in farming and grazing, and have dealt some in lands and know something of them from experience and from observation. I have traveled nearly all over the State, and been in nearly every county.

Question. What would be a proper classification of the land under physical circumstances?—Answer. There would first be the arable land; that which would produce a crop of cereals without irrigation, and which lay in the the northern part of the State. Agricultural lands; that is the lands without irrigation, lands upon which crops can be raised with safety, without relying upon irrigation; they lie all north of the San Joaquin River, excepting a strip upon the coast that is watered by the fogs. Then there are the irrigable lands—those that lie in the San Joaquin Valley, and extending down into Arizona and Nevada. Then there are the timber lands.

Q. What would you do with the timber lands?—A. I have not paid much attention to the timber, except in a disconnected way; but I think it would be best for the preservation of the timber lands, and for their protection, either for the State to own them or reduce them to private ownership. There is a great deal of waste in the public timber now. It is not utilized as if it belonged to you or me. We would use up the whole tree, but I notice in the mountains that they will take some of the best trees and only use one-half of them, and allow the balance to go to waste, which makes food for fires; and when they do take fire they burn up the whole country.

Q. Do you think it practicable to sell or dispose of the timber lands to small owners?—A. In regard to them it might be better to do so, but I hardly think it practicable for this reason: it is very expensive to put up mills, and you have to manufacture the lumber where the trees grow. Parties putting up a mill must have some assurance that they will have sufficient material to manufacture. If it was in the hands of small owners the mills would have to depend upon them for the timber, and the small owners might form a combination and put the timber up on them; and nobody can afford to put up a mill for one hundred and sixty acres of timber land, because it is so expensive to construct a mill. Agriculturists would not enter this land because they are not contiguous to the agricultural lands. California is peculiarly situated in that respect. The timber is generally some distance in the mountains, away from the agricultural lands, and farmers can buy the lumber they need for building purposes much cheaper than they can have a mill constructed on the land and manufacture it themselves. It is a very mistaken idea that farmers that have a farm of a section or quarter of a section should own timber enough for building purposes. This is impossible here, because the timber and agricultural lands are not contiguous; and then to have to put up expensive machinery and manufacture the lumber takes aggregated capital. They cannot manufacture their material any more than they can build railroads or export their farm products; it is a business by itself.

Q. What have you to say of the irrigable lands?—A. The irrigable lands are in the southern part of the State, and I have not had much experience with them. I know that the land in that part of the State is of no value to the farmer without irrigation. I do not think our agriculturists can compete with other places, for they have to cultivate by means of irrigation. A great deal of the best wheat land is here on the low foot-hills, but it will be impossible to irrigate them without enormous expenditure for irrigation that the production of wheat will not justify. I think the small farmers can take out water—that is, where it is not too far from the streams—but I am under the impression that it is decidedly better that aggregated capital should build the water ditches, canals, &c., and take out the water and take it to the farmer. Then the farmer can use it. There cannot be a monopoly, because in some seasons they can do without water; if they put up the prices, they will do without it. I think the ditch companies would be compelled to sell the water for a reasonable price. I do not apprehend much danger of a monopoly in irrigation from water rights if the rights are granted in a proper manner.

Q. How should these rights be granted?—A. Well, I think it would be best, if they could all agree together, to have a community system of irrigation, but you will find in any community that have got to do it on the co-operative plan there will always be disagreements. You let a lot of community farmers own a water ditch, there is very apt to be many disagreements, and it would hardly succeed; but if a company owns it and they have capital in it, and manage it as they do steamboat companies or railroad companies, &c., there will not be any danger of monopolies. Yet, while I do not think there is any danger, it would be better, if it was practicable, for the parties owning the land to own the water rights.

Q. What have you to say concerning pasturage lands?—A. The pasturage lands are far greater in extent in this country than the irrigable lands. There is a great deal of land that is only fit for pasturage. These lands are situated in the foot-hills and mountains; the valleys in California are always, unless it is very dry, suitable for raising crops, except in the southern part of the State. The valleys, properly speaking, in the southern part of the State are all productive and are not now used for grazing, because there is very much sheep land that does not cost them anything to graze on, and which they use for grazing instead of these valley lands.

Q. How can pasturage lands be best utilized by actual settlers thereon?—A. I do not know. There are grades even in the grazing lands. You might say there is first, second, and third class grazing lands. The first class is suitable for horses and cattle; the second is suitable for sheep, horses, cattle, and goats; the third class is rough and rugged, and is only fit for sheep and goats. I think if some plan could be adopted to bring them into private ownership it would be better, for this reason: they could be improved and utilized, and would bring a revenue to the State and country. I think the grass would be better preserved. I have noticed that after the lands are closely cropped it only takes a year or two to reproduce the pasturage, and to get a crop as good as they had before. Most grasses out here are reproduced by the seeds; but some by the roots, as the bunch grass. These lands certainly cannot be pre-empted or homesteaded in small tracts, for the reason that there are sections that you cannot get water on, and then nothing smaller than a section could be utilized for grazing purposes. They certainly ought to be sold in large bodies. Thus they should be reduced to private ownership; they would be improved and would bring revenue to the State and government. Six hundred and forty acres would be enough for the first-class grazing lands; then, after that, it would take two or three thousand acres of grazing land to make the equivalent of 160 acres of agricultural lands.

Q. Are there any grazing lands where a man could live on 640 acres?—A. There are some few localities where they might, but it is owing, of course, to what their needs are. If I was going into the business of grazing I would want more than 640 acres of the best land, but there is a spirit that fears monopoly. It would be better, of course, if the stock men had a small area of irrigable land to go with the pasturage land. I think it would be better if the streams could be reserved, and that the owner of stock might raise a small allowance of grain off his farm and have his place where he could build his home. If each stock man could have 10 or 15 acres of irrigable land with his pasturage land it would be decidedly better. If such a system could be adopted I think it would be advantageous.

Q. What do you think of continuing the reservation of mineral lands?—A. I think in a mining district you cannot do otherwise than reserve the mining rights, but to some extent it would depend upon the size of the mines, as to how much timber would be needed to operate them. I am inclined to think that it would be a difficult matter to so separate the timber from the land as to preserve the rights to both the timber and the mines. I would not like to place any impediment in the way of discovery or in the way of working the mines, except that I would not want to have the washings from the mines go into the valleys and destroy the best lands we have. They have destroyed a great deal of valuable land in that way.

I should like to speak of an evil that exists under our present system, under which parties by throwing a brush fence around several thousand acres can hold it under a possessory claim and keep out settlers. I think that those who have the exclusive right to the land should pay some revenue to the State or to the government. As I understand it, most of the grazing lands are on the hills and mountains, and there are streams running through them. You cannot water stock very readily by digging or boring in the land. Whatever else is necessary for a stock farm it must have some water on it. I am decidedly of the opinion that it would be better if each farm should have a certain amount of this grazing land attached to it; but the farming lands and grazing lands are so remote from each other that it would be difficult.

I am satisfied that a great many farmers who are farming in the mountains want grazing lands. If they can get them a few miles off it would be of value to them and the two interests could be carried on together; but the fact is, that the valleys are suitable for farming and the grazing lands are in the foot-hills an immense distance off. In a word, if you could get them together and give each farmer a small portion of it, it would do, for he could utilize it, but I do not think in the grazing districts there are sufficient arable lands for a man to be a farmer and carry on his grazing. A great many men, however, now have a farm in the valleys and a grazing farm twenty miles off. That is a very good arrangement. I think this in time would bring the grazing lands cheaply into the market and would induce farmers to have a farm in the valley and to get hold of these arid lands and use them for grazing purposes when they could.

I want to make a little additional statement in regard to the timber lands of this State. There is a great deal of grazing now in the mountain districts. I find that pas-

turing it really is an advantage and keeps out fires. I think that the sheep never browse upon the fir and pine timber; but, on the contrary, they eat out the grass and undergrowth, and keep out the fires in that way. I do not think that the sheep and goats injure the timber in any way. It has been said that there is a tendency to destroy the young timber by grazing, but I think it is not so; stock would have to be very hard up to eat up the young trees.

Testimony of H. S. Bradley, Nevada City, Cal.

MARYSVILLE, *October* 28, 1879.

H. S. BRADLEY, of Nevada City, Cal., testified as follows:

Question. How long have you lived in the State, and what is your profession?—Answer. I have lived in this country 29 years, and am a land surveyor by profession.

Q. Upon what subjects do you wish to testify?—A. What I am now about to say applies solely to Nevada County. The rivers run easterly and westerly, that is, the main streams run east and west, and between them there are ridges. Nevada County extends clear over to the Nevada State line, and from the summit of the Sierra Nevadas to the State line there is a tract of country upon which there is no mineral, 10 miles wide by 25 miles in length. The western portion of the county, or rather the middle portion, is entirely a mining section, and it is about this that I desire to speak.

Q. What is the character of the mines?—A. Placer mines and quartz mines. By placer mines I mean gravel mines.

Q. Suppose, Mr. Bradley, we speak of this land in the order of timber land, agricultural land, and mineral land.—A. Very well. The ridge between these streams to which I have referred, and which run to the west, are high and are covered with timber. The formation of the surface is several hundred feet in depth, and is what we call up there "mountain lava." All the ridges are covered with this lava until we approach nearly to the lower end of the mountains, and as we come down in altitude the gravel appears on the surface, and the "lava" gives out. Extending easterly these same gravel deposits exist, capped by this "lava" and covered on the surface with timber. Originally it was very heavily timbered, but most of the timber has been cut off—more than half of it.

Q. Is there a new growth?—A. A new growth does not seem to take place there as readily as it does in the lower altitudes. In Grass Valley a growth is very rapid, and can be used for timber in the mines in a very few years.

Q. What was your proposition about this land?—A. This land comes under the head of mineral land, upon which under the laws of Congress they have made locations. They make locations under the law allowing 20 acres to each man. Probably the whole of it is located for "drift" mining, while not one hundredth of it is worked at present, neither by drift or any other kind of mining. It is held under the law of Congress, and without any expenditure of labor upon it either. It is held simply by filing, recording, and describing the proper subdivision that they claim. There are 100,000 acres of this land, all of which is claimed in that way. It is pre-empted legitimately under the laws of Congress. It is done in this way: I think well of a certain locality, and I get my own name and your name and 8 others and place my notice on that ground, describing what subdivision of land it is, and place it upon record in the county recorder's office. I then buy you all out, and thus hold the eight locations. I then go on and locate another 160 acres in the same manner. It is fraudulent in one sense of the word, still it complies with the law. There are men up there who hold thousands of acres. They do not have to expend any labor upon it. The law of Congress is explicit upon that point in regard to quartz claims only; as soon as they come to placer claims they evade it by saying that "if it is a local custom to put a yearly expenditure upon these claims, the locator shall do so; if it is not the case, he need not do so." Since '72 the local laws have not been recognized.

Now, the point we are getting at is this: These ridges between the water-courses are wide and flat upon the top, in some cases 10 or 12 miles in length, and very good grazing land a great deal of it. The timber is pine. Now comes up the conflict. Men go on this land and make their application for agricultural land; it goes through its regular course, and the parties are cited to appear at the land office, and if they do not appear in person they must settle by affidavits the character of this land, whether or not it is agricultural land. The man gets an absolute patent to it. To do this he must actually live upon it himself. He builds a little cabin, lives there, and makes a small clearing. When he gets his title he moves off, and as he does not want the land he moves off and goes through the same process again.

Q. Can he do that twice?—A. They attempt it sometimes twice, and it seems to me

that a man is allowed to file on land twice. If he does not file on it himself he gets his cousin or some one else to do it for him.

Now we will go on with this subject. This conflict is taking place more and more every year between two classes of claimants for this land; one wants the timber the other wants the mines. The deposit may be from two to six hundred feet in depth and the miner may have to develop it from the sides, or he may have to go down in shafts; at all events, he wants all the timber for mining purposes; he needs every stick of it. Now, I am not prepared to make any suggestions how the law can be modified to give the two conflicting interests their different titles. The miner wants the bottom and the timber, but he does not want the surface of the ground. If the two interests could be arranged satisfactorily it would be advantageous. As long as the mining population has to be there it must make a living as well as the agriculturists. Take the mining population, over here in Nevada County where there is not a foot of agricultural land, they cannot live on cabbages and oat hay, he must have some other commodity, so that any law that prohibits or curtails the mining interest stops it all, for the agriculturist cannot live in that neighborhood if the mines are stopped; they cannot haul their products to San Francisco; they must sell to the miners, and if they are stopped they cannot live there.

Q. Are you acquainted with the timber on this slope of the Sierra Nevadas?—A. Yes, sir.

Q. To what extent is it being cut off?—A. I am not prepared to say. I could have told you just how many feet is cut annually in that section of the country, but I cannot now.

Q. Is there large tracts being stripped of forests?—A. Yes. The entire area I have mentioned is being stripped of timber because it is available. The cañons are also full of timber, but I do not count them because they are inaccessible.

Q. Is there large timber tracts burned off by fires?—A. No. There are heavy fires there every fall, but I never observed that they destroyed much living timber. They burn underbrush and fallen timber and dead logs, but never standing timber. The worst damage done is to the young growth of trees which are destroyed by the fire.

Q. Is there any waste of timber?—A. Oh, yes.

Q. How is it destroyed?—A. The waste of timber has been caused, and is still to a great extent, by "shake" makers; they have destroyed almost all the accessible sugar-pine. You can pass through the woods and see it lying in every direction. The sugar-pine tree will have a few feet taken out of the end of it, and the rest left to decay. When the fires get in the dead timber burns out, but I have never observed that it destroyed any of the standing timber to any amount. Sometimes I have seen a tree killed here and there, but never to any great extent.

Q. How do mill men get their timber?—A. They get their timber now by locating this land I am speaking of, as mining land.

Q. Do they complete their titles?—A. No, sir. In some instances they do. One mill in Nevada County, above Dutch Flat, holds a United States patent to quite a tract; others, in some instances, have obtained possession by buying the locations made by third parties; others have located as mines, preliminary to applying for and obtaining a patent hereafter. As a general thing, they take off the timber and then abandon the land. This is true in many cases.

There is still another complication upon this land. The Central Pacific Railroad claims all the timber upon the odd sections, and they sell it to individuals in tracts from 40 to 160 acres, or any legal subdivision. They have sold considerable to sawmill men. They sell it for a term of five years; that is, the timber upon it, and allow a man to cut off what he can. Then, I presume, at the expiration of the five years he can go and buy it over again, but there have been instances where they have sold it after a mineral patent has been issued upon a grant. A man holds a patent and grant from the United States that says in consideration of what he pays he is to have that land with all its "privileges, immunities, and appurtenances." Another individual goes to the railroad authorities and buys the timber upon the same land and cuts it off. That leads to violence. There was one murder committed within the last two weeks on that account.

Q. Are these conflicts frequent?—A. They have not been carried so far as that, but there are several such threatened. I have never been driven off ground in surveying lines myself, but I have several times expected it, and I have heard men come jumping through the woods near where I have been and say: "Oh! it is you, is it? If it had been so and so, he would have had to 'git' from here." It has caused a great deal of feeling.

Q. What do you think of the government trying to protect its timber land and sell its timber, retainining the fee to the land?—A. My interests and feelings all center right upon this land I have been speaking of, and in that case I think the government should sell it directly to the miner from the surface down with all its timber. It seems to me that he has then a title as a basis to go on. He can sell it to whoever he pleases, and make his own conditions as to use hereafter. The miner really needs

the use of the surface and the timber upon it. He needs a portion of the surface for access to his mines.

Q. How much of that lava-carried gravel is there in California?—A. There is 100,000 acres in Nevada County, and there are some ridges running through Placer County, and they run through Sierra County. North and south of these two counties, I am not familiar.

Q. What would you do to prevent the damage by *débris*?—A. I should say at once in a general way that you cannot stop this damage that is coming on to Marysville and this lower country unless you can reverse the laws of gravitation. I say as an engineer that you cannot stop the tailings and coarse material too from coming down, but as long as the water flows this sediment comes with it, and it will deposit down here; that is what does the mischief. I do not think there is any remedy to it. I can convey it to the tule (too-li) lands, but it will be at the expense of taking all the water from the river. It would make excellent land of the tule land. What I say does not apply to Smartsville but above Smartsville. It must be at some point with sufficient grade to take out to the tule land. The dumps of the principal mines in Nevada County are some 1,500 feet higher than these towns.

Q. After this exceedingly fine soil called slickings is once deposited, is it easily taken up again?—A. It is easily acted upon by the action of the water, if there is any grade for it to move down.

Q. Does it not form another colored clay?—A. No; I think not, generally. I know what you allude to. Where hydraulic mines have a top to them of this red loam and this is run exclusively, that sediment looks like "adobe."

Q. Is not all of it of that character, mostly?—A. A very little proportion of that comes down is of that character. There may be about six feet of that earth on the surface and then the remaining 200 feet or more is sand, pipe-clay, and gravel underneath that.

Q. The coarser material does not come down?—A. Well, Mr. Saxie told me to-day that stones are beginning to come down more and more every year.

Q. What would be the cost of carrying the tailings to the tule lands?—A. The average cost of lumber would be $18 per thousand feet, and I cannot call to mind any particularly difficult places to construct a flume that would make it very expensive. Most of the flume would be on the ground or low tresstle-work. There is this difficulty: If you could take all the fall from the claim itself where it is high and the river has a little more fall you could dump it in the foot-hills, but the hydraulic miners must use the whole of this fall clear to the river itself for the sake of the gold, so you cannot take it out as high up as that—you cannot get height enough to be of any good.

Q. Suppose you were to dump it into the tule swamps, would it not choke up the flume very soon?—A. It would do that in many cases, but it would spread over a vast area. You would have to add on box after box and then divert it and add on more boxes. You cannot dump it in one place very long. It would take a big flume. Owing to the long distance up and the low grade, it would take all the water of the river. That is the difficulty; it would not do to take all the water of the river. I think that would raise greater trouble than the *debris* question itself, if the river was dry at Sacramento. Take out all this body of water that comes in from the Yuba and Bear Rivers there would be very little water in the summer season, notwithstanding the Feather and Sacramento Rivers. The Sacramento would be nearly dry. If the tailings were taken into the first tule swamp it is true that the water would return to the Sacramento River above Sacramento, but it would take an immense body of water.

I am personally interested in hydraulic mining, but I give it as my opinion that either Marysville or hydraulic mining must go.

Q. If hydraulic mining goes on, how long will it be before Marysville and the whole section of country is destroyed?—A. Marysville is in danger at any time. If you stop mining to-day the next severe winter that comes is liable to destroy Marysville.

Q. Suppose an injunction is procured against hydraulic mining, would the miners abide by it?—A. I think they would. I think the sentiment of the miners at Smartsville is that they are willing that this thing should take its course before the courts. The Smartsville people say, let this thing take its course and whatever is done we will abide by it.

Q. What would they do then if an injunction were procured?—A. They would become impoverished and this section would become depopulated; but I think they are willing ultimately to be recompensed, if their industry is destroyed, either by the State or general government, for the value of their claims. The government has sold us this land, and have recognized a certain condition of things here for a generation and protected us in it; the legislature has been in our favor; it has gone on for a generation, and the miners think it preposterous that it can be stopped at a moment's notice. They do not realize that it can possibly be done.

Q. Is it not possible for the miners to take care of this *débris* and still obtain a profit?—A. No, sir; I dont think it is.

Testimony of V. G. Bell of French Corral, Nevada County, California.

SAN FRANCISCO, *October* 15, 1879.

V. G. BELL, of French Corral, Nevada County, California, president of the Milton Mining and Water Company, testified as follows:

I have lived here since 1857, I think. Practically, in this matter of *débris* there is not sufficient account taken of the material collected in the rivers during the early mining in the State. In the first place mining that was done in the State was, as a matter of course, done in the cañons and gorges, and this went on for some years before the hydraulic mining process came into vogue. I think it was in 1854 that the first hydraulic mining I know of was done. Prior to that time mining had been going on in the gorges and on the surface altogether, and a lot of alluvial material was already removed and stored up, and after the hydraulic process came into use the principal part of the mining had been completed. The first season that we had a flow of tailings or *débris* was in 1862–'63. All old Californians will recollect that that was a very heavy season and it rained very hard, and the floods ensuing therefrom brought down the whole of this light substance and deposited it in the beds of the streams. That was the first year the Bear and Yuba Rivers were flooded up above their banks. This accumulation of course came from all this washing that had been going on from 1849 up to that time. This light material had accumulated to a considerable extent, but still the floods of 1862–'63 concentrated it and run it down and filled up the rivers and spoiled all the good farming land that there was in the country, which in our section—in Yuba and Nevada Counties—was the bottom land. Outside of the bottom land we did not then consider the land of any value whatever. In fact it seems strange to me that there is farming land in the country. I, as a miner, always looked upon it as a mining country, and I would not have taken a thousand acres of land lying between Marysville and Sacramento as a gift, because I looked upon it as a mining country. After the floods of 1862–'63 the *débris* covered up all that I considered farming land. This red land that we supposed of no value for farming has turned out to be a very good farming land.

Since the floods of 1862–'63, hydraulic mining has improved and got the more modern appliances, and facilities for that kind of mining have increased. They have run long, expensive tunnels to the bottom of the channels, but during the mining of the early days the tops were being washed off and it was the light material from the surface and the gorge diggings that went down. Now we are running off the bottom, and it is just as much as we can do to remove this heavy, rocky material from the mines, and when we shove it through to the river there it stops, and whereas the floods of early days carried down thousands of yards of material there is now really only a very small percentage that is being washed down. It has practically ceased, on account of the heavy nature of the material. There are large fields for hydraulic mining and there is still a great deal of this top material which may come in, but at the same time a very large proportion of it was washed off at an early day, and we are now mining the heavy material at the bottom.

The Milton Mining and Water Company during the last mining season spent $40,000 in giant powder to blow up the banks and blast and break the rocks; so that you can imagine something of the kind of work that we have to do in order to break up the rock and break up the material so as to get it into and through our sluices.

I do not pretend to be an engineer, but it looks common sense to me that by damming up these river channels and by stopping the heavy *débris* and not letting the light material go through, we simply prevent all the material that we are running down from going into the rivers. We have abundance of land in every section of the country which we could fill up with the tailings. We have two large tunnels, one to the South Yuba and the other to the Little Yuba, about 400 feet above the main channel of the stream. The inclination is about eight inches in fourteen feet, or two-thirds of an inch to the foot, and then from the mouth of our tunnels down to the river it is in the descent about 400 feet. From either one of these tunnels at present the dumpage down of this *débris* is comparatively small.

The lower country is still experiencing the effects of the old original mining done years and years ago. For instance, I know one or two persons who have helped to put in a great deal of this *débris* and now want to sue us for filling up the river.

Q. What do you think about the square location?—A. I do not pretend to be a lode miner, but if I was I would very naturally be inclined to think that one ought to have the right to follow the dips and angles.

Q. Do you wish to say anything about the timber?—A. No; except that the destruction of timber ought in some way to be stopped. The destruction of timber that is now going on is terrible. Timber is destroyed that is never utilized at all. For instance, there is a great deal of timber cut off for shakes or shingles; a portion of the tree is used and the balance lays there and rots; there are thousands and thousands of feet of timber of that kind. The sugar-pine, which is the finest timber in the coun-

try, is being all destroyed. Still, there is a great deal of it left, and I think it would be better for the government to put that land into private ownership—sell it to any one who would come in and purchase it for milling purposes, or for the purpose of utilizing it; they would take care of the timber then themselves. Very frequently it is the case that a miner will go out and cut down a tree to get only a few lengths, and in that way a great deal of timber is destroyed. The timber will be better protected in private ownership.

Q. In what sized tracts would you sell it?—A. I would sell it in tracts of 1,000 acres, and I would sell it from $1.25 up to $5 or $6 per acre, according to the growth and quantity. All the timber lands should be placed under the control of the district land office.

Q. What do you think about the locators of placer claims being compelled to pay up within a certain time?—A. I have had some experience in obtaining patents for placer mines, and I think a man ought to be compelled to pay up for his placer mine within a year from the day of entry. A great deal of litigation has been brought on by men going on to a prior location. Under the mining laws it has been a custom that the prior locator had original right. We have had considerable litigation from the fact that when we have made application for a patent some person who had probably located the land years and years ago, and about whom nobody knew anything, would file an adverse claim in the Land Office and cause us a great deal of trouble. That sort of thing should be done away with.

Just here I wish to say that this whole subject of contests should be left to the district land office.

With regard to adverse claims, I should say that the law should provide that adverse claimants should not (after a certain period) be allowed to come in and file an adverse claim. I would have a statute of limitation. We are fighting a case now in the Land Office. Our predecessors held a mine for twenty-five years, the location of which was made in 1853. Now there is an adverse claim filed against us. The surveyor testifies that there was a certain amount of work done, but he does not testify by whom this work was done. His affidavit does not say that the adverse claimant did it or who did it, and the fact is our predecessors did the work that he claims to have done. Now we have to go to work to show to the contrary, and it is a good deal of trouble, and in fact there is too much red tape about the land business. The first placer patent that ever I got through was held up about twenty months. Since that time I have one that has been pending since 1873 and is still pending. The evidence is plain and sufficient, but it was sent up some six or seven months ago on some little technical point. I applied to an agent in Washington, and he seemed to expedite it along. He expedited it so much that my partner and I thought he did it too quickly, and that there was some little underhand arrangement about it. I think persons should be enabled to get their patents at once, and not be compelled to pay agents in Washington. If this matter was left with the district land officers, they could facilitate matters very much. I do not think these questions should be taken into the courts, but that they should be settled in the Land Office, as they involve matters of fact. The questions that arise are generally questions of fact rather than questions of law.

Testimony of Patrick Carroll, Nicholas, Cal., relative to the effect of mining débris on the agricultural lands and navigable waters of California.

PATRICK CARROLL, of Nicholas, Cal., testified, October 27, as follows:

I have lived in this State twenty years exactly. I have been engaged in farming nearly all that time, except one winter I spent in the mines.

Question. Where do you live now?—Answer. I live close to Nicholas; about two and a half miles south of Nicholas.

Q. You are familiar with the extent of the silting of Bear River?—A. Yes, sir.

Q. Please state what you know of the matter.—A. Undoubtedly Bear River is filling up to a great extent. I think Mr. Justice stated it correctly when he said that at the point where he lived it was twenty-eight feet to the bed of the river at that point. Taking it at the mouth of Bear River—and I have been familiar with it for nineteen years at this point—I am confident that at the present time the loss of bed does not exceed five feet, and probably four. This loss arises from the filling up of the bed at the mouth. As I stated, I have seen the Bear River at this point when there was no *débris* in the river scarcely; and seeing it now and then ever since, it seems to me that the filling is more above, growing less as you descend. The filling has deen decreasing to the mouth, and there there has been a loss to the bed of about four feet.

Q. What has been the spread by this means of the flood plains?—A. I will answer that question by saying that the Bear River Valley is a narrow strip of land. Now, this portion of Bear River that is under water is not very extensive; that is, the land

on which the *débris* is now settling. At this point where the lawsuit has originated—that is, the point where the *débris* wants to spread out the most on to the land, and they have tried to confine it by levees—at this point Mr. Key's levees raise the water, as I think, about sixteen feet above the bed. The distance between the two points is about eighteen miles. In this eighteen miles the bed of the river has been raised about twenty-four feet; the consequence is that it has a rapider current. Since the capacity of the river has lessened they have been trying to control the water to prevent its spreading. The siltings are, of course, damaging the crops.

As to the character of this *débris*, I would divide it into two parts, the quicksand and that which is held in solution and carried through to the lands below. I call that fertile. It is not good for grasses; but for corn and potatoes it is exceedingly good, I think. At Mr. Key's, where the water wants to spread out, I think the quicksand prevails; and that is almost useless. As we come down from that point the quicksand drops, being the heaviest. At that point I think they have every reason to complain. Mr. Key is, I know, a great sufferer. He has been trying to control this water, but it breaks out of the levees on his tract and leaves the quicksand; and it is impossible to grow grain there, for it is almost sure to be caught by the *débris* and lost. There is no question of the justness of the complaint of the farmers along in the belt in which Mr. Key has his range. I don't wonder that they should complain; because the deposit is there so great, and it breaks out there so much, that it destroys all the crops. The nearer you get toward the hills the greater is the deposit, growing less as you come down toward the mouths of the rivers. Last winter I differed with my neighbor. Without knowing that it was the business of the State engineer, I set up a low-water notch at a point near Nicholas. I found the water at its lowest stage, and left it there, to see how much the river would rise at that point. On examining it this year I found that the water had sunk eight inches since the previous year.

My idea of the river *debris* is this: that there is a grading of the river taking place. The tributary streams I look upon as raising up at the upper end and getting a greater fall. I consider that the change of the Sacramento is merely the leveling of the uneven bed, as the water does not run up and down the various irregularities that we find in the river. When the water comes down charged with deposits I think there were deep holes that were filled up, but not the whole bed of the river.

Q. To what extent on Bear River have farms been destroyed and injured?—A. Mr. Key's and Mr. Brewer's farms have both been destroyed. Their lands were very well cultivated, but the *débris* has come on them so that they do not find it very profitable to farm their lands now.

Q. Are there any other persons similarly situated?—A. I believe at the point above it is about the same way. The quicksand is so great there that they can only raise potatoes, and the greater portion of it is grown up in willows. There is no fertilizer in quicksand. Generally speaking, I would say that the area of spread has not increased.

Q. How far from the mouth of Bear River do you reside?—A. Where my residence is situated is about four miles from the river; my land is next to the mouth of Bear River.

Q. How far from Bear River do you reside?—A. I live about four miles from Bear River; that is my residence. My land goes to the mouth of Bear River.

Q. Two years ago was there not a greater water plain over your section than you ever knew before?—A. No, sir, I think not, because the amount of water that broke out was not as much as when I had no levees. In 1862 the Coon Creek and the waters of the Sacramento came up next to my house, but since levees were built up of course the volume of water cannot flow in them that could in the early days; so that I claim the flood land plain has not been much extended.

Q. Do you build the levees yearly?—A. Every year. We build the levees in this way: Whenever we find them trying to hold the river on both sides we build our side higher. We built the levees on our side first. In trying to control the streams to do it you must level off the easements of the river; so in that way we have to raise the levees, and the loss to the river comes too in this way. We have lost in the depth, but gained in the fall, and have a rapider current. I will explain here why there has to be higher levees and why the levees are broken. The water coming from the foothills around the bends of the river surges strongly up against the banks of the levees. The consequence is the levees are too weak and break. You can see that over here at Yuba City.

Q. Where did you live before you came here?—A. I lived on the Mississippi River to some extent before I came here. But I did not take any active part in making the levees there. I have no knowledge of the levee system there.

Q. You said that you had land at the mouth of Bear River, and you had land between Bear and Feather Rivers, outside the levees?—A. Yes, sir; I have 160 acres, lying between the levee and Bear River.

Q. Do you notice any perceptible filling from year to year on that land?—A. On the land itself, yes, sir. On a portion of land that was thrown out by the levees into the water there was a hollow I expect about 200 feet and that hollow is filled up now.

Q. In general, are the areas of lands that lie between the rivers and levees filling up?—A. Yes, sir; and almost already are filled up, nearly all that it ever will; where the water stood 10 feet before, now it cannot stand over 2 feet, so that we have mud now instead of water.

Q. And is all the land along the Bear River between the foot-hills and its mouth—the bottom land—is it now in the hands of private individuals?—A. Yes, sir; I think it is now as far as I know; I don't know of any government land except that among the foot-hills; there may be some railroad lands. Whatever effect this *débris* is having, it is on private land.

Testimony of Charles H. Chamberlain, receiver of public moneys, San Francisco, Cal., relative to public lands, irrigation, pastoral lands, homestead and pre-emption laws, private entry, land laws, agricultural lands, timber lands, unsurveyed lands, contests, cancellations, records, framing of notice, timber unsold, timber laws, title, age of timber land, mineral lands, declaratory statements, claims.

CHARLES H. CHAMBELAIN testified at San Francisco, October 6, 1879, as follows:

I have been receiver of the land office at San Francisco since September 6, 1866.

I should say that perhaps one-third of the lands in this district yet remain unsold. There is very little mineral land in this district. Most of the remaining unsold land is grazing and timber land. The southern portion of this district and all south of the bay that remains unsold, reaching down to Santa Barbara, to within six miles of this city, is grazing land. There may be spots that can be cultivated, but principally they are grazing lands.

Question. If there are spots cultivatable, can it be done without irrigation?—Answer. From here down to Santa Barbara there cannot be much irrigation; there are no streams that amount to anything, except in the valleys in the lower part of the district right along the water-courses; there may be a little saline land that can be irrigated, but there are few streams on the slope toward the ocean; very little of the land in this district can be irrigated. The San Juan district does not come within my jurisdiction.

Q. State, in a general way, the area of this land district.—A. It takes a southward line five or six miles north of Santa Barbara; takes in a portion of Santa Barbara County, all of San Luis Obispo, and all of Monterey, and all of San Bunaventura. It runs from the line of Humboldt to the southern portion of San Bernardino and takes to the summit of the Mount Diablo Range on the east.

Q. In that range you stated that the agricultural lands remaining unsold are almost entirely pastoral in character.—A. Very generally pastoral in character. There are spots that can be cultivated, but most of them are grazing lands. They graze both sheep and cattle. They generally calculate that it will take one acre to one sheep and three acres to one steer. That is north of San Francisco. It is where they have plenty of rain. Our average rainfall here is nineteen inches, and is more as you go north. South of San Francisco, taking a good season, it would be about as it is north. It grows bunch grass, and bunch grass grows from the roots; other grasses grow from the seeds. If the bunch grass dies out the alfillaree grass comes up. When one grass dies another comes in next year. The grasses naturally reproduce themselves. The ground seems to seed itself; that is, where it comes from the seed alone. Then we have wild oats in spots, but it is mostly on the coast. These unsold public lands are very thoroughly used for stock.

Q. Under what law can title now be acquired to them?—A. Under the homestead and pre-emption law. There was some considerable amount that was put up at public sale some years ago. They cannot afford to pay very high for these lands.

Q. Are the pre-emption and homestead laws applicable to the sale of these lands?—A. Yes; though I would increase the amount that could be taken. I would allow them to take 640 acres, so that a man could support himself and family. I would require the land to be put to such use as it was fit for. This would require a slight change in the law. I would make a pastoral homestead law; that is, a residence on the land, with pastoral features.

Q. What would be the objection to allowing the land to be purchased in different sized tracts, as purchasers might desire to take it in?—A. The trouble is they would fall into the hands of a few men. It throws the whole land into the hands of a few men who would keep out population.

Q. Has that been the general result in this land district?—A. I think this would be true in the southern portion. A whole township has been bought up there by one or two individuals, and this township I think is still held by the same individuals. Another trouble that appeared in their system was that they bought up right along the streams; they controlled all the water by that means and thus controlled all the country back of them. By and by they found that there was danger of men going back of them and buying up the land along the river, above their possessions, and then they bought

up both the water and the land. There should be some provision by which they would be compelled to confine themselves to one section, and there should be some such provision precedent to the survey of that part of the country. Up north it does not make any difference, because there there is plenty of water. The land should be surveyed in accordance with the character of the water, so as to give each lot a certain amount of water. I do not think that can be done now because it is rather late. If that had been done at an early date it would have been better for the country. From my own knowledge I cannot tell whether it is practicable to do this now. I think it can be done in some parts of the country.

Q. Do you know of any streams where the United States has not sold the land?—A. There are streams on the map, but whether there is water in them or not I cannot tell you now. That portion of the district is driest. The surveys were made in early days along the streams. The land along the streams was taken up and the back country was left; and now you cannot tell from the maps whether there is water in these streams or not.

Q. You object to the system of private entry because it tends to create monopolies?—A. Yes.

Q. Under the present law, how much land can a man get?—A. He can take up 320 acres under the pre-emption and homestead laws, and he can buy from others. If they could raise timber, through the timber-culture act they could have another 160 acres. The desert-land act does not amount to much here; if it did, that would be 640 acres more.

Q. Do they require *ex-parte* evidence?—A. They require them to show the character of the land before they can locate it here.

Q. It is done by *ex-parte* evidence, is it not?—A. They never attempted it but two or three times in this district.

Q. If a man offered you his application and showed you the evidence, would you not be obliged to take it?—A. If they made *prima-facie* evidence I suppose I would.

Q He can come in and get it under that *ex-parte* showing, can he not?—A. I suppose he can, subject to having it set aside by the courts.

Q. Has there ever been an instance where a man showed you the proofs established by law and you have objected to it?—A. There have been such cases. We have never had but one or two such cases. I should refer the matter to the department. We refuse them if we know from the character of the country that it could not be cultivated.

Q. If I understand you, a man can take up 320 acres of land under the homestead and pre-emption acts, and it is possible for him to file on 160 acres more, and it is possible for him to buy 640 acres under the desert-land act. He might have, say, something more than 1,000 acres?—A. Yes, provided he can find land suitable that would come within the provisions of these laws. He could not always get a desert-land location alongside of his homestead.

Q. Under the law he comes with his *ex-parte* evidence as to the character of the land and pays you 25 cents an acre; you have only an arbitrary power to refuse that man his application?—A. Yes; that is true. It can be set aside afterward. That has never been attempted.

Q. In addition to that is there any hinderance to any man's taking any amount of land with additional homesteads?—A. None but the price we charge for them. I don't think they can afford to locate these common grazing lands. It is simply a question of cost; they will be paying too high for the use of the land for merely grazing purposes. They could afford to use the desert lands for that purpose and pay 25 cents an acre for them and hold them for three years and get the use of them for the 25 cents. It is simply a question of a man's means and whether it will pay him as to the additional amount of land he would get.

Q. Under this present law that restricts the claimant to 160 acres they in fact allow of a system of monopolies or taking up a much larger amount?—A. Well, the law provides that he can take 160 acres of pre-emption and homestead 160 acres; that is no evasion. He can take up timber-culture homestead, and if he really cultivates the timber he has benefited the country.

Q. Under the rulings on the homestead and existing laws can they take up any amount of additional land?—A. Under the laws they can.

Q. What objection is there to passing a law that would enable a man to take this large amount of land at once? Would not that be less expensive to the people?—A. Yes; that is what I say. I would give him 640 acres of these lands through his pre-emption or homestead—that is of these grazing lands—and change the law so that by keeping herds it will comply with the law as much as by agriculture. Then you might give them an additional 160 acres if they would cultivate the timber on it.

Q. Returning to the strictly agricultural lands, do you see any need of keeping both the pre-emption and homestead laws in force?—A. No, I do not. They could give them the right to pay for it and let their rights run back to the date of settlement.

There would be no necessity to keep them both in force; that will cover the whole thing.

Q. Can you state in this connection what has been the proportion of pre-emption filings proved up?—A. A little more than 50 per cent. of the filings made have been proved up. Down in the southern country there has been a great many filings made and allowed to run out. There are a great many cases where a man never paid for them. The sheep men who have their herds file upon these lands so as to keep control of the land, and then when the time runs out they have another man file on it. I think that is a common practice. I know in the southern part of the State but very few filings are proved up. Persons living in the southern part desire to preserve their ranges for their herds, and file a declaratory statement in order to maintain their control over the land. When that filing expires somebody else takes it. There are some sections where there must have been fifteen different filings made upon one section. It is simply done by the proprietor of sheep herds for the purpose of maintaining sufficient land to support his herds upon and keep other people off. They especially file upon the water. They have a shanty there for their sheep-herder. A stranger comes here and looks upon our books and finds that section filed on, and there is in reality a man there, and upon the face of it it is a legal claim. The government gives a receipt for the filing, but it will not prevent another man from settling there and fighting it out.

Q. Suppose it is a homestead application instead of a pre-emption filing, what would be the situation then?—A. It would have to be canceled. Nobody else could file on it. Under the pre-emption law it is a mere notice for him to do something, but under the homestead law it is an entry. In one case it is a filing, in the other case it is an entry. This filing can be done under the homestead application as well as the pre-emption, but under the homestead application it costs too much. It costs $16 under the homestead act; under the pre-emption act it costs $3, a difference of $13. That will hardly stand in the way, but it is very cumbersome. He has to come to the officer, and it gives him too much trouble. I don't think the homestead right is much resorted to in order to maintain control of their land.

Q. Aside from the pasturage-land entry under this dummy system, is the dummy system resorted to to maintain control of the timber lands?—A. No; I don't think it is used to hold the timber lands, although it may have been used to acquire title to them. I think that probably mill companies sometimes employ men to file on the land and enter it. Of course they commit perjury by doing so.

Q. Then you have reason to believe, from your experience, that entries under the pre-emption laws have often been used for the benefit of parties other than he who makes the entry?—A. Yes; from what I can see I should conclude they have been so made. Of course, men say they have entered for other men, but they are never willing to face the music.

Q. Is it your observation that these lands thus taken up were afterward held by a number of different claimants, or do they immediately pass into other ownership?—A. I have never been over these lands, and do not know exactly; but I think that a man who takes the timber land intends to sell it immediately to the best advantage. They sometimes use it. They sometimes work the timber up themselves.

Q. What is the rule as to the unsurveyed lands?—A. They violate the law in that they cut the timber off for sale. The trouble is you cannot get the courts to punish a man for cutting the timber. The only man we ever punished was a justice of the peace named Gilroy. He advised men to cut the timber, and cut it himself. We had him arrested and the court fined him $15.

Q. Are there many cases like these, where men engaged in lumber and timber enterprises have their employés file upon the land and hold it long enough to cut the timber off and then abandon it?—A. I don't know of any such cases.

Q. Suppose that a record claim under the pre-emption or homestead laws is filed in your office and the question of abandonment is afterward raised, what steps are necessary afterward to have that abandonment established?—A. The department have rules about that. A man has to make affidavit that it has been abandoned over six months. Then he will have to pay the expense of investigation.

Q. The expense of the investigation is upon the party who makes the affidavit?—A. Yes; the applicant has to pay the cost. We hold the investigation, and if we reach a conclusion that the homestead has been abandoned, we send the testimony up to Washington; and if they are satisfied with the proof, they cancel the entry and send the case back here. If the man who abandons the land make a declaration of forfeiture, we have no control in such case; it rests altogether with the department, just as in other cases. Until the cancellation is declared made by the department we have nothing to do in the matter at all, not until we are notified by the government.

Q. Under that system do parties who make application and deposits of money get the benefit of it?—A. Often they do, but sometimes they do not. I think there should be an amendment in that respect.

Q. Have you ever had any occasion to observe what proportion of original applica-

tions for abandonment get the benefit of the final order?—A. There are only one or two cases where some one else has stepped in and taken the land away from him, although he had to pay all the expenses.

Q. What is there to hinder an original holder from filing on that land again?—A. He cannot, because he has exhausted his privilege. That is the rule of the department.

Q. How long does it take before this notice of cancellation comes back from the department?—A. Generally about one month.

Q. How long does it take to get notice from a contest?—A. It takes on an average about one year.

Q. The expense of that contest to prove the land abandoned rests with the person who desires to file on it. What does it cost?—A. The costs generally would not amount to more than $6 or $7, probably not more than $5 where there is no contest.

Q. Do you think it would be proper to permit the land officers all over the country to make cancellations?—A. It seems to me that would be giving them too much power. The better way would be not to allow entry at all, but let them file on it without regard to the fact that it had been homesteaded.

Q. Suppose a man walks into this office, files with you a written abandonment of his claim, has the register or receiver the power to declare it abandoned?—A. Yes, sir; of course.

Q. Suppose he does not do that, but suppose a second claimant comes in and declares upon the affidavits of two persons that it had been abandoned, what objection would there be to permitting you to set that title aside?—A. Well, I suppose it would expedite business.

Q. The General Land Office keeps a duplicate of all township plats, and all entries that are made upon the original plat are also made upon the duplicate township plats in Washington. If you were allowed to make cancellations it could be recorded there, could it not?—A. Perhaps it would be the better way to do that.

Q. When the notice of that cancellation is received by you the land then becomes subject to application, by whom?—A. By the very first comer. But if there is a preemptor living on the land his rights will attach before any other person comes in. If there was a man living on the land his rights would attach the very moment that land is canceled. There have been cases of that kind decided, where there was an entry canceled, and the real man living on the land at the time has the first chance, in preference to the man who wishes to file with his scrip.

Q. All that you would have to do when that notice of cancellation came, would be to receive the first legal applicant that came. If anybody subsequently appeared, that would involve a contest, would it not?—A. Yes, sir.

Q. The relative rights of these two parties would be a matter for subsequent contest. You would be obliged to receive the first application, which might not be that of the man who had been making this particular effort for the cancellation of this claim?—A. Yes, sir. I think a man who makes an application for cancellation ought to be protected.

Q. How would you suggest a remedy for that?—A. I would amend the law so that the man who had settled on the land should have a right from the date of the settlement. The greatest trouble at present is the decision of the Supreme Court, which is, that occupancy and inclosure is sufficient to remove the land from the jurisdiction of the United States Land Office. There should be a change in the law that the mere inclosure or occupancy of United States land, without any claim under the United States law, should not be held to give a title to the land as against a United States officer. It would be better for them to hold it in that way; then they would not have to pay for it and pay taxes for it. The decision of the court (made by Judge Field) is that the possessory right holds.

Q. How long after the filing of the township plat does the settler have to place his claim upon record?—A. Three months.

Q. Suppose he does not do it?—A. Then it is subject, under the law, to other claimants.

Q. What form of notice do you have?—A. There is no form now. There was a provision under which we used to advertise. We have a blank now, and as soon as there is another applicant we mail that blank to him (the first applicant).

Q. There is no legal form of notice as to filing upon that land by some one else. If, then, the settler resides a hundred miles from this office, would it not be possible for speculators to cover over the whole of that land before he could get in to file upon it? Don't settlers often neglect to file within ninety days from lack of knowledge?—A. Yes, sir; there are some who do not file for a year. I do not know of but few cases where they really lose anything, because if any other settlers came in squatter location could not keep them off.

Q. The law provides that these lands shall be open to entry and settlement. That notice which is sent is sent by the courtesy of the officer, and not by law. It is only on the old surveyed land that it is likely to occur. On other lands a man does not

file in time. It simply illustrates that parties who are on the ground can keep parties off this land. The person on the ground has great advantage over those at a distance?—A. Yes, except that the other has three months to file on it.

Q. And should there not be some modification of the law prescribing the framing of notice?—A. I think there should be some provision by which (as it was some time ago) the surveyor-general should publish a notice that on such a day he should put in such and such a range. But the publication notice would not do it all.

Q. Would it not do to have the register and receiver, when application was filed, to publish a notice in the paper nearest to the township letting the time of the pre-emptor run from the date of that publication?—A. I think our way is about as well as another. We send to the nearest post-office and have the notice stuck up there, and unless the postmaster has some interest to prevent it from being stuck up that would be as good a way as any.

Q. Would not the whole thing be simplified in the form I suggest by authorizing the register and receiver to publish it in the newspaper nearest to the land?—A. Yes, but it would not reach in all cases. In some cases there are no newspapers published. In the district of San Luis Obispo, which reaches away back to the mountains, there is no paper published.

Q. What proportion of timber in this district remain unsold?—A. I could not say. It is chiefly redwood, and there is some oak. It is only used for fires, but the bark is used for tanning. That is the great trouble; they cut the timber off for the sake of the bark for tanning purposes. The land in that vicinity is mostly in private ownership, so that there is not so much depredation.

Q. In your judgment, does the present timber law work beneficially or not?—A. It does not. It does not seem to have done much one way or another. I do not think there has been more than three or four applications in this district, though there is so much timber cut. Where it is accessible from the coast the timber has been pretty well taken out; back from the coast, where it requires considerable outlay of capital, there is a great deal left. There is pine and spruce timber. Where they cut off the redwood the spruce and pine sprung up. There has been a good deal of timber taken off the government lands on that coast. You cannot tell much about it. Nobody ever complains unless they have an ax to grind. You cannot get a man for $3 a day to hunt up timber depredations.

Q. Do you not think the timber laws of the United States would be better executed under the jurisdiction of the land offices than by any body of agents here?—A. The land officers themselves cannot leave the office. The care and charge of the timber land would be better subserved by the district land offices than by anybody else.

Q. Under what forms do they get title to the timber?—A. They used to get it by State selections; most of the large companies got it thus, but this is stopped now. That is the way it used to be. There is but little buying of the timber land at present. So far as they have taken the timber it has been by State selections and additional homestead; so that, while there is a timber law, the timber is disposed of under other laws and the timber law is not operative. Persons up in the mountains cut and sell the timber.

Q. How do the provisions of the present law as to taking it on mineral lands for domestic, mining, and agricultural purposes operate?—A. I guess it is a free license to take all the timber there is there.

Q. Would you have the subterranean rights reserved from the surface rights? Would you sell a man the timber, reserving the land to the government?—A. I would give a man the timber from his land. I would make no distinction. I would subject the mineral lands to the same laws that I did the agricultural lands in the same tracts.

Q. Would you sell the fee to the timber land and make no provision for the timber for the future?—A. No; I would compel them to keep a certain portion of their land in growing timber. I would only allow them to cut certain sized trees.

Q. Suppose you sold the standing timber in alternate blocks, and reserved in each alternate block the fee of the land to the government?—A. You misunderstand me. I mean that I would let them buy it all, but they should be regulated and compelled to keep certain portions of it in growing timber.

Q. If you sell a man a tract of 640 acres of land and undertake to put a condition to the title, would that amount to anything as a question of law?—A. That might be; I do not know how the courts would hold it.

Q. Is not the general policy against forfeiture of title?—A. Yes, sir, I believe it is; but I believe that Congress could make a law by which they would forfeit the title if they did not comply with the law.

Q. Do you think that the natural morality of this section is such that they would prefer to steal rather than to use their own timber?—A. Human nature is about the same everywhere.

Q. Is human nature such that when a man possesses a thing he wants to go and steal his neighbor's?—A. They don't look upon it as thieving.

Q. Now, they practically cannot get it, and they must have it. Is that the case?—

A. Yes, sir. That is just the reason why they take it. Many men who take timber now go and cut it without any intention of making the land from which they cut it their homes; but there is an inducement that leads them to enter the land and cut the timber. The man who cuts the tree does not take into consideration the interest of the community.

Q. What is the age of this timber land?—A. I do not know that anybody has ever counted the rings on the trees. They average eighteen hundred years. Redwood springs up very quickly.

Q. Suppose we have a law passed by which the timber land can be sold in quantities to suit purchasers for building purposes, &c. Frequently the timber lands as a general thing are mineral lands. Now, what will be the effect on discovery and prospecting for mineral if title to the land passes from the government to individuals as timber land? For instance, suppose I could buy 640 acres of timber land *as* timber land; but that land is also mineral; what effect would that have upon the discovery of mineral?—A. If it was in the mineral region I would confine the entry to 160 acres.

Q. Would you sell the surface rights and reserve the subterranean rights?—A. If it was mineral land I should sell the timber (because if you do not the government gets nothing for it) and reserve the subterranean rights.

Q. Suppose the land is mineral and timber land both.—A. If you reserve it at all, I would sell the timber and reserve the mineral land.

Q. How would it do to sell the title to the surface of the land for agricultural and timber purposes and reserve the subterranean rights?—A. We sell land now and the title goes to the people; but if there is mineral discovered, the government can claim the title to it.

From what I can learn about the redwood, it sends up twelve to twenty sprouts. If they would take pains to cut those sprouts out and leave from one to three, the timber would grow very rapidly.

Q. Don't you think a man should have the right to make as many declaratory statements as he pleases?—A. No; because then a man would have an opportunity to file on the whole country. A man fails to make his improvements; he cannot hold the property; another man comes along and buys him out. Then, under your theory, he would jump another claim and make other slight improvements, and sell it.

Q. Why not allow a man to do that?—A. The law says that no man shall file under this section more than once. If he had used up his homestead pre-emption right prior to the act of 1873, he would have the privilege again; because the statute says, since the passage of that act.

Q. Suppose a man does not prove his title and moves off from and sells the land to some other party, and goes off somewhere else and again files on a piece of land, why should he not be permitted to have a second claim?—A. Why should he have the privilege of tying up land two or three times?

Q. Does it do the government any harm?—A. No; but it is a mere speculation.

Q. Still, would it not be a speculation beneficial to the government, to the country; does it not make a home for some other person?—A. Well, yes, if he has improved the land at all; but the other man has to pay him for his improvements.

Q. Would not the actual fact be that the man coming there has the benefit of the land?—A. Yes; the old law in 1853 provided that anybody who had had the benefit of the pre-emption in any other State should not be prevented from filing on lands in this State.

Testimony of S. R. Chandler, Yuba City, Cal.

MARYSVILLE, *October* 28, 1879.

S. R. CHANDLER, of Yuba City, made the following statement:

I came to this place in October, 1849, and have been here ever since most of the time. We did not suffer in Sutter County much until 1865, and in 1867 we made an effort to build a levee. There was a committee appointed to make services and estimates, and I was appointed a sub-committee of one to attend to this matter especially, and I made estimates and superintended the building of the first levee. It was from Yuba City north to the opposite side of Feather River, to keep off the slough. About Christmas the water came, and what we supposed to be an enormous pile of dirt the water ran over and washed away. We then got a law passed by which we could form a district known as the levee district No. 1. This district contained about sixty acres of land. We proceeded to levee. Our law would permit only 2 per cent. tax to be levied on all of the property in the district. We did not come quite up to that. We worked at first on the 2 per cent. tax, but that was insufficient for the purpose. We afterward got the law changed, allowing the commission just what taxes they needed. Last year we levied a tax of 3 per cent. for leveeing purposes, and expended

all. This season we have levied a tax of 4 per cent. and are again building our levees, but it is very likely they will break again from the fact that the water just above the mouth of the Yuba River at low tide is at least twelve feet higher than it was when I first came here in 1850. A keel of a boat would be twelve feet higher now than it would have been in 1850. In consequence of this the water stands so high that, were it not for our levees, the water to-day would be running waste over some of the most valuable land.

Q. What amount of land is exposed in this manner?—A. About six thousand acres in levee district No. 1, every acre of which would be destroyed if the water came over the levees, and there is two or three times as much, which is equally valuable, liable to be destroyed in the same manner just in that neighborhood. Taking it all, there would be 150,000 acres which would be destroyed to-day were it not for our levees. The tax is from 3 to 4 per cent. on every article of property in the district.

Q. What is the condition of the land between the Yuba and the flooded lands to the east, spreading from the Yuba to the Bear River?—A. I do not know the number of acres, but it is fifteen or sixteen millions, and were it not for the levees they would be destroyed. Much of it is already destroyed.

Q. How much land would be destroyed if the levees break?—A. An area, say, of ten or fifteen million acres. It is not destroyed yet, but it has only been saved by the expenditure of large sums of money. It has probably cost as much money as the land would sell for to-day to save it.

Q. There is a large body of swamp land west of Feather River. How far back is it from the river before you reach that swamp land?—A. Well, from six to eight miles. The land descends gradually toward Feather River west until it reaches what is termed the tule or swamp land.

Q. What is the area of that tule land?—A. That is perhaps 100,000 acres. I do not know exactly. There is a large amount of it in the levee district No. 5—95,000 acres of it, and there is some other besides that, which would make it about 100,000 acres in all. This tule land and the lands bordering on them is only for haying. Much of it is valuable for grazing, and then again much of it is not valuable for anything.

Q. Is it on the next river below the Bear?—A. American River.

Q. Are you acquainted with the condition of affairs on the American River?—A. When you have the history of the Bear River you have the history of the American River.

Q. Is the area destroyed as large on the American as on the Bear River?—A. The property there was not so much flooded as on the other rivers.

Q. Has there been as much mining?—A. There has been a large amount of mining, and the land is badly injured and would all have been destroyed but for the levees.

Q. What is the next river south?—A. There are three or four little rivers. I am not well acquainted with that region. I have been from the country and I am not well acquainted with it. The history of one of these rivers is the history of all of the rivers where there has been hydraulic mining. There has not been so much hydraulic mining on those rivers as on this, in consequence of the filling up of the Yuba and the damming of Feather River. There are some very valuable farms on the Yuba side of Feather River that were the oldest and most valuable orchards (with the exception of the Briggs orchard) that we had, and they are all gone.

We have used, for the purpose of saving our lands, large sums of money and for the mining hundreds of thousands of dollars. If it continues three or four years longer it is utterly impossible, even with an assessment of a hundred per cent., to save them. That is my conviction, having studied the matter as thoroughly as any other man. I wrote the first law in which we attempted to levy a tax and the revised law. I have paid especial attention to it for the last twelve years, almost to the exclusion of other business.

Testimony of Galen Clark, Yosemite Valley, Mariposa County, California.

YOSEMITE VALLEY, CAL., *December* 7, 1879.

1. In reply to a few of the questions submitted by the Public Land Commission, I will state that my name is Galen Clark. I reside now in Yosemite Valley, Mariposa County, California.

I am one of the commissioners appointed to manage the Yosemite Valley and Mariposa Big Tree grants, and am the guardian appointed by the board of commissioners to look after the local interests of these public grants.

2. I have lived in California 26 years, and in Mariposa County 25 years.

3. I settled on public land in Mariposa County, township 5 S., R. 21 E., Monte Diablo meridian, in March, 1857.

In 1871 I, with three others in the township, deposited money with the United States surveyor-general in San Francisco to pay for sectionizing said township.

In January, 1875, the surveyor appointed to survey this township had not yet filed his plat of the survey in the land office at Stockton, and the land not yet being subject to pre-emption, I sold my claim and interest in my improvements to other parties, having put $20,000 worth of improvements upon it.

I have never sought to acquire title to any other public land since, and still hold my certificate of deposit, and also one issued to my son at the same time, who died before the completion of the survey.

6. Yes. As by the present law these certificates are not transferable, the law should be so amended that if a person dies, or other circumstances take place so that he cannot make use of his certificate of deposit in entering land, either he or his heirs may get his money back again. There are a great many such certificates now lying useless in California, while the Land Office Department has long since had the benefit of the money.

7. The physical character of the public lands in this county is hilly and mountainous, and nearly all either pastoral or timber land, very little being fit for cultivation, or mineral.

AGRICULTURE.

13. It is practicable to establish homesteads on the pasturage lands for small stock-raisers, more especially for raising Angora goats, as this land is mostly covered with brush and scattering, scrubby timber up to 2,500 feet above tide-water. Each settler should be allowed not less than one section, and as much as four if he can pay for it. The price should not be more than one dollar per acre.

14. It is advisable that these lands should be put in market as soon as convenient. Perhaps the quantity might be judiciously limited to about six sections taken in one body.

23. The growth of grass has diminished where sheep have been pastured in the foothills and mountains.

24. Cattle will not graze on the same land with sheep or goats, if they can get off of it.

28. Most of the corners of the lands surveyed are well defined and marked.

TIMBER.

1. All the eastern mountainous portion of the country is timber land. From an elevation of about 2,500 feet above tide-water up to about 6,000 feet the forests are composed of Pinus ponderosa, P. lambertiana, Picea grandis, and Libocedrus decurrens, all very fine, with black oak and live-oak in some localities. Above 6,000 feet the trees are mostly Pinus jeffreys, P. contorta, P. monticola, Pinus flexilis, and Picea amabilis.

2. No timber is planted in this country.

3. All the timber land in the Sierra Nevada Mountains should be sold up to an elevation of from 5,000 to 6,000 feet above tide-water; in regular lots up to one section or two, to one purchaser. The price should be not less than two dollars per acre. All above about 6,000 feet elevation should never be sold to private parties or subdivided into sections. It had better be given to the State of California upon the express conditions that it shall be forever inalienable, and the strictest laws passed for its protection and preservation; none of it ever to be cut except in certain localities by special permission, to be used in mining interests of the same locality.

The sheriffs of each county, or some other suitable person, should be made a deputy marshal to look after this higher unsold portion of the timber lands, with a compensation for every arrest and conviction for trespass, either by cutting timber or setting fires, such as will make it a matter of self-interest to be vigilant in his duty. Perhaps some localities with fine meadows and grazing lands might be leased to stockmen to graze horses or cattle, each county in which the land is located to have the larger portion of the lease-money for the benefit of its public schools; but neither sheep nor goats should ever be allowed upon any condition to be ranged on this reserved public mountain domain. Every possible safeguard should be made use of to protect and preserve the forests of the higher Sierra Nevada Mountains. If these mountain forests ever in any way or from any cause become in a great measure destroyed it will cause a large portion of the richest part of California to become uninhabitable and comparatively valueless, rendering it annually subject to great floods and severe drouth, and ruining all the mountain streams as a source of water supply for irrigation.

5. When pine forests are felled in California there is a second growth of the same original kind starts up and grows very rapidly when fires are kept out of it.

6. Fires originate in the mountain forests in various ways; by hunting parties and camping parties, of either whites or Indians, from carelessness in leaving their camp-fires. But many originate with stockmen, especially sheep herders, who set them to

clear up the country to enlarge their grazing grounds. Fires at present do not spread to so great an extent as formerly, before any stock were driven to the mountains, but are more numerous, and destroy great quantities of trees, both great and small. Large quantities of stock herded in the mountain forests tramp up the dirt and make trails, which prevents each fire from spreading to very great extent; but being more numerous the damage is about the same. The only way to prevent fires that I know of is to make the penalty so severe for setting them, and the reward of the deputy marshal for arrest and conviction of offenders so liberal, as to make him ever vigilant. This question of the prevention of fires in mountain forests is a very difficult one to solve. If fires are kept out of the forests for a considerable term of years there is such an abundance of combustible matter, such as pine cones, leaves, dead limbs, and fallen trees, accumulated that if a fire does get started by any accident it is very difficult to stop its spread, and it is liable to destroy large sections of the forest, the heat being so intense as to kill nearly all the trees in its course. I have personally known several fires to originate by lightning.

7. The only way to effectually stop the depredations on the public timber is to sell all of such portions as I have recommended below about 6,000 feet elevation, and let private interests protect its own domain by its own vigilance and the laws of the State.

The foregoing remarks are respectfully submitted.

GALEN CLARK,
Yosemite Valley, Cal.

Testimony of J. T. Clark, Livermore, Alameda County, Cal., relative to public lands, irrigation, water rights, pasturage lands, titles, homesteads, Spanish land grants, government patents.

J. T. CLARK, of Livermore, Alameda County, Cal., testified at San Francisco, October 10, as follows:

I have lived in the State fourteen years, and have had ample opportunities to become conversant with the public lands of the State. I have been for the last ten years connected with litigation growing out of the land system of this State. I know but little about timber lands; my experience has been altogether with the arable and irrigable lands. I do not know that I have paid as much attention to the classes of lands as to the means of obtaining them. In so far as the arable lands are concerned, I differ from most persons. I believe that a great portion of the lands called irrigable lands are, in fact, under proper cultivation, arable lands. Indeed, I have observed that fine crops of corn and vegetables may be grown upon the adobe lands by cultivation. I think that the arable lands of the State, as well as the irrigable lands, should be held for actual settlers instead of for speculative purposes, as has been so often the case.

Q. Take the lands in Southern California; can they be cultivated without irrigation?—A. Possibly the great volume of these lands can't be made arable, but there is a large quantity of lands in the State that are regarded as not being susceptible of proper cultivation without irrigation which I believe can be cultivated without irrigation. I think the arable lands cover a greater extent of country than most people think they do. There still remains a large amount of irrigable land, and as I stated before they should be held exclusively for actual settlers in small quantities. I believe that has been done in Tulare, Fresnal, and other places. All the water necessary for irrigating purposes will be brought upon the land by the labor of settlers, and I believe that the troubles which grow out of the extortionate water rates would thereby be avoided. My opinion is that the people who would make homes upon the land and add to the taxable property of the State by building school-houses and developing the resources of the country, the men who need homes, ought to have them, and they will bring the water upon their homesteads and reclaim them. I would not, except in very exceptional cases, charter water companies. I think the streams could be taken out by the actual settler, and I think if they were forced to do so they would do it. I think that in course of time people would settle on the Colorado Desert and take out the water of the Colorado River to irrigate it with. There are thousands and thousands of men who need homes, and my opinion is that these men will adopt a system of irrigation which will be successful, and by which that country, like a great portion of the San Joaquin Valley, will be reclaimed and then made exceeding valuable.

Q. Have you thought of a plan or law by which the water right shall inure to the land?—A. It unquestionably should, because the land without the water is worth nothing in those districts that are only susceptible of reclamation by irrigation.

Q. What would be the effect eventually in this country on the agricultural industries if water companies are organized and have control of the water?—A. If water companies have control exclusively it strikes me it would be ruinous, since it places in the hands of a corporation the power to sorely oppress the agriculturists. I do not

think it would be judicious to permit a corporation or association of individuals to have control of that without which the lands of the State are valueless.

Q. You recognize as being a physical basis of classification the body of land I call pasturage land; how would you dispose of that?—A. That class of land, of course, is only useful for persons who own herds, and herds require a great deal of food, and food is, to a considerable extent, scarce upon a large portion of this land. Thus it would necessarily require more land than is now allowed by law if a person desired to live upon that land with his herds. Of course the quantity of land that should be given to a man for grazing purposes would depend upon various circumstances. I think that one or two sections would, ordinarily, be sufficient. Sometimes it would require very much more, and sometimes less.

Q. Suppose the water of the small streams was reserved for the use of pasturage farms, so that when a man acquired title to a pasturage farm there would be water sufficient to irrigate a few acres of land?—A. That would give him a portion of land that might be irrigated for the purpose of raising a small amount of grain, &c., and would necessarily diminish the amount essential for a pasturage farm.

Q. What are the means of obtaining titles?—A. It seems to have been the policy of the government in the homestead act to provide homes for people who need them, and it strikes me that this is one of the best provisions that has ever been attempted by the government. It is founded on the idea that men need homes and the government needs people to own homes to make the country prosperous. It strikes me, however, that the pre-emption feature might be abolished, since it is surrounded with a great deal of fraud. People oftentimes take up a piece of land under the pre-emption law under a previous contract to sell the land to somebody else, as soon as the title is obtained. It appears to me that the homestead law is right in policy, and that the length of time necessary to obtain title should be extended. No titles should be granted at all. It is a question in my mind whether the title should ever pass to the individual. I think, instead of that, that the right to the occupancy of the land should be granted upon condition of continuous cultivation, and the government should have the right to give the lands to somebody else in case an occupant sought to abandon it. I think the fundamental idea that "homes for the people and people for the homes" is the one that should be adopted by the government. The prosperity of the people depends upon their having homes. It is a question in my mind whether, having obtained homes, they should be permitted to alienate them.

Q. What effect would that have upon the improvement of the country?—A. I can understand that that argument might be presented with considerable force. I think the policy of furnishing a homestead upon which people have been required to live for five years has been so effective and beneficial to the country that I should like to see it carried out to its logical sequence, which would seem to indicate that you have the same right to require a man to live on the same homestead ten or twenty years that you have to require him to live there five years. I can understand that there are exceptional cases, and that there might be exceptions to the rule, but in my judgment it would work great good to the country. As the system exists now, the moment a man gets into embarrassment he hastens to mortgage his homestead, oftentimes at ruinous rates of interest, and eventually he loses it all; and he not only loses his property, but the State loses a valuable citizen, and the community is to that extent damaged. The effect is that the poor men who need homes and who cannot live without them get them tied up in such a manner that they lose their homesteads, which pass into the hands of men who do not utilize them, but hold them for speculative purposes. It strikes me it would be well for the government to exercise a fatherly supervision over the welfare of the people.

Q. Suppose your system was adopted and you permit men to sell their homes, would their improvements revert to the government?—A. I am offering this as a suggestion, and possibly it might be unjust not to permit the occupant to sell his improvement.

Q. The improvements include a great deal; the horses, barns, cattle, sheep, orchards, even the cultivation of the soil, are improvements.—A. Of course it is an idea that can't be successfully contradicted that no government can be successful and prosperous whose people are not prosperous, and the prosperity of every branch of industry depends directly upon the success of private interests. When they are prosperous, all branches are prosperous; and when they are bankrupt, the country becomes bankrupt also; and it is with this in view that I believe that the homes of people should be secured to them, and that they should be kept in possession of those homes independent of exterior influences; then they can't become bankrupt. They may lose the produce of this year's labor or next, but they have the soil to depend upon for the year to come, and they can't to any irreparable extent be ruined. The condition of affairs which exists all over the United States to-day will show the fact that the farmers of the State are, to a very considerable extent, either bankrupt or in process of reaching bankruptcy; and if that be true, a ruin that can't be measured will be the consequence; and if our people can be independent, if they have a home which under the most adverse circumstances they own and which can't be alienated, the country can't be otherwise than prosperous. There has been a law in force, and I believe it is

in force now, under which the State receives from the Government of the United States title to every 16th and 36th section. This, in my judgment, has been of very great damage to this State, and should be repealed. There has arisen here the following custom: for instance, John Smith held a grant under the Mexican Government (prior to the acquisition of this territory by the Government of the United States) for an indefinite amount of land, say five leagues, within certain definite exterior limitations, perhaps forty leagues, within whose exterior boundaries would of course fall many 16th and 36th sections in townships, and persons in this State who wished to acquire title to valuable lands anywhere within the State, and particularly in the land district, would go to the State surveyor-general's office and show by the lines of the land claimed that those Mexican grants covered the 16th and 36th sections, and make application for one-half or for one section of land through dummies, in lieu of those 16th and 36th sections claimed under the Spanish grant.

It has been the custom to have this land approved to the State from the general government, and after having been listed thousands upon thousands of acres of such lands were turned over to the State which should have been held for pre-emption and homesteads, and which fell into the hands of men anxious to obtain large bodies of land by the payment of $1.25 per acre for lieu lands. When these Spanish grants came to be surveyed, instead of taking in forty leagues of land, they would be cut down to five leagues of land, and the 16th and 36th sections, for which land had been improperly taken off in the good portion of the State, would fall outside the grant, and as a rule they too were applied for by these men who were anxious to obtain large tracts of land; thus they got both. A law requiring the settlement of the title to these Spanish grants would settle the matter. I think all these grants ought to be settled within one year, or they should be forever barred. I am opposed to the granting of land to a State or to any individual. If they are granted to anybody, they should be granted to the citizens of the country, who should be compelled to live upon them.

Q. Do you know of an instance where lieu lands have been granted and subsequently the original lands for which the lieu was made have fallen into the hands of the State?—A. Yes, sir; I can give you an instance where the government ruled on one section of land in my neighborhood. A section of land was claimed under a Spanish grant. It was settled up by four men. After the Spanish grant was cut down to its proper limits, they made application in this land office for the land. In the mean time, however, they had settled what that land was, and it was restored to the public domain, and before it was possible for anything to be done with it it was listed to the State, and the parties paid the State for it. In the end, the listing to the State was canceled, and other parties were permitted to make their proof in this land office, and they did so, and paid the government for the land, and got a patent from the United States Government for the land, and the original men drove them away from their homes five times, and, finally, they lost their lands, although they had actually paid for it.

Q. Do you know that, after land grants have been settled by Congress and their boundaries defined, the deputy surveyors in surveying the grant for the owner changed the boundaries as defined by the approved grant lines, and that persons have obtained rights to them in that way?—A. It strikes me there is a very notorious case of that kind in Los Angeles County, where there were two grants lying about four miles apart. I know of a case in Alamada County, in which the deputy surveyor sent down to survey some land that was claimed under a Spanish grant surveyed a township on account of the Mexican grant, and at the time he was making this survey other parties were making applications for the even-numbered sections of land under the lieu location.

There is one thing more I would like to say. I suppose the scope of your investigation is intended to reach all classes of public lands, and I presume you have been in Tulare County. If so, I have this to say about that: The land grant of the Southern Pacific Railroad was through a certain district of country, and certain counties were named through which the road should pass. There were parties at a distance of 125 miles from where the railroad was being built who had brought water upon their lands and irrigated them by means of miles of ditches, and after they did that the railroad procured a joint resolution from Congress to change their route and run their road through the lands of these settlers, and the road is attempting to drive them off. They are not respecting the rights of these settlers at all.

There is another thing. I recited to you awhile ago the case of four men who received patents from the Government of the United States for their homes, though it was decided by the government to have been an error to have listed the lands to the State, and the parties purchasing from the State took away from the pre-emptors their homes, for which they held government patents. It seems to me that this error having been committed by the officers of the United States, it is the duty of the United States Government wherever they issue a patent to defend it. This case was finally carried to the Supreme Court of the United States, and the decision of the State court was overruled. The decision of the district court was in favor of the pre-emption patent, but it was overruled by the Supreme Court of the United States.

Testimony of J. W. Clarke, of Livermore, Cal.

J. W. CLARKE, of Livermore, Cal., testified at San Francisco, October 15, 1879, as follows:

I have lived in this State since 1860. My object in coming before the Commission is to call its attention to the manner in which settlers on public land are treated. My own experience in the State has been that it costs more to pre-empt land than it does to buy it outright. My theory is that when the Interior Department declares land public land that the settler should be protected in his rights upon that land. Take Livermore Valley. In the first place, settlers took up the whole of the eleven leagues that was claimed in the Livermore grant, whereas the grant was only entitled to two leagues, as decided by the government, which declared that all outside of the two leagues was public land; accepting which decision, we filed upon it and have been in constant litigation ever since. We were on the State lieu lands. My experience is that it costs every man $500 to pre-empt one quarter section of land. Litigation has cost me $500 on my quarter section. I would do away with the pre-emption right entirely. Make it a homestead, but require a long residence to confirm the title. I would do away with the 16th and 36th sections of school land for the reason that they have caused more litigation than all other causes combined in the State. Surveyor-General Minnis tells me that he found over three thousand applications for lieu land that were delinquent. He brought suit in the district courts to set the purchases from the State aside, and they were set aside. The land speculators had located lieu scrip on large bodies of land. They paid 20 per cent. when they located their tracts, and then, from that time, 10 per cent. per annum, and, having failed to make these payments, General Minnis held them to be delinquent and brought suit in the district courts to set the purchases from the State aside. Mine with many others were set aside by the decision of court; and one year after that suit was brought against me, claiming that I held a United States patent in trust for these lieu locations that were made in 1863 and had been declared forfeited. These are the evils that we have to complain of. I think the United States law should be so amended that whenever the Secretary of the Interior declares a piece of land public domain the United States Government should protect the settlers from litigation, and this is one of my reasons for wanting the 16th and 36th section law done away with. Let the government make donations instead of that. I would not have any person acquire title to the public domain except by homestead, and I would grade them according to the quality of the land.

I object to the theory that some gentlemen have advanced in regard to the homestead pasturage—the theory of allowing persons to accumulate all the land they saw fit. I am opposed to the holding of land in large bodies. In Livermore Valley there is an instance of that. In 1871 the Secretary of the Interior declared all the land outside of two leagues public lands and ordered the register and receiver to treat them as such. Every quarter section outside of the two leagues, instead of the eleven leagues that the grant-holders were trying to obtain in the valley, was settled upon our schools. We filled up some seven houses with the school establishments, and then the railroad came and claimed the odd number of sections and went to litigating the settlers one by one and dispossessing them. The consequence was that it took more than one-half of the land from those seven schools. Now that railroad land is farmed—perhaps one or two sections by one man—and rented. The tenant has no children, perhaps, and you can't have schools and villages where the land is held in large tracts. I think this hilly and mountain land might be graded, and if you confined a man to six hundred and forty acres of land it might do, but to allow him more than that would be bad policy.

As to the surveys, that country was all surveyed in 1867, and I guarantee that there are no two surveyors that can take the field-notes of that survey and run the same lines by those field-notes. The settlers there have had two or three different county surveyors take the field-notes and go to one of the township corners to start, but they could not find the next township corner they were running to. I think it was the fault of the surveyor, because if the survey had been made upon the ground the corners would have been established, and they would have been found, at least some of them, but there is a scope of country from twenty to twenty-five miles square that I venture to say you can't find five corner stakes in. This is in the Livermore Valley. Where stakes have been put in the ground they were of California oak, and they rot out in two or three years. Then another great trouble has been the large landholders, I think, destroy the stakes. I never saw them do it, but it was generally understood that they obliterated the corners wherever they possibly could. The fault was with the government in not compelling the surveyors to establish the corners more permanently. I think the present system of surveying is a good one, and the true system.

Question. Has there been much destruction of timber?—Answer. I find that there is a great deal of timber being destroyed all over the country wherever the timber is accessi-

ble. Men will go and squat upon a piece of heavily-timbered land. Perhaps they will file on it, if they think they are in danger of being molested. Then they have two years and a half in which to prove up, and by working on that land for that length of time they will cut off an immense amount of timber and sell it. All the wood that is hauled in the town of Livermore is hauled off of land that the government has never been paid for. Private individuals, when they get hold of it, protect the timber, and it will be safer in private ownership than it will be in any other way. I would confine the sale of the timber to 640 acres; I would not exceed that. It ought to be graded, making a distinction between timber that is suitable for milling purposes and timber that is suitable only for fuel. The timber is being greatly devastated, but not so much by fire as by cutting. There has been some fires this year that run over thirty or forty thousand acres perhaps. It is to the interest of the farmers to protect the timber. That interest would be intensified if they owned the timber land.

Q. Have you had any experience in irrigation?—A. Irrigation is difficult in some years. It would be an immense benefit to that country, but I have had very little experience in irrigation. We are without the means of irrigation, though we think we are pretty well off if we summer-fallow. That is the next thing to irrigation.

Q. What is the difficulty in the way of irrigating?—A. The difficulty is with the supply of water. It would be impossible for us to get a supply of water without taking it away above where we are, out of King's River, in order to get it over the Livermore Mountains. Artesian wells would be our only means of irrigation. There was one artesian well bored to a depth of four hundred feet, and the water rose to within two feet of the surface.

Testimony of Sherman Day, of Berkely, Cal.

SHERMAN DAY, Berkely, Cal., testified at San Francisco, October 14, 1879, as follows:

I was formerly United States surveyor-general of California. I have lived here for thirty years. There is a subject I would like to make a statement to you about now, because it is not quite certain that I will have another chance while the commission is here, and which relates to surveys. When I was in office here, I noticed that the State of California had very great difficulties in getting appropriations for the survey of public lands from Congress. A great many people have been disposed to blame either Congress or the Commissioner of the General Land Office, or the surveyor-general, because those appropriations did not come and because we did not get all that we asked for. We cannot expect all we asked for, because we are brought into competition with the necessities of many other States, and get our full share of public appropriations. The Army and Navy have to divide a good deal of their appropriations on this coast, and we are not likely to get all that the Commissioner of the General Land Office and the Secretary of the Interior recommend, or even the amount we ask for; though I do not blame Congress, because they are trying to economize. Now, under that state of things, it has occurred to me that if Congress would limit the use of the appropriation for public surveys in California to the townshiping lines, that that would bring the United States land survey and its stakes and established corners within the reach of something like four times the number of people that it does now, by spending a portion of its appropriation in townshiping and a portion of it in sectionizing. There are twenty-four miles to be surveyed around a township, and there are sixty miles to be surveyed within the limits of a township after the township lines are run, for the purpose of subdividing and sectionizing it. The difference between the price of surveying the township lines and section lines would enable us to survey other townships. For two or three hundred dollars we can bring the stakes of the United States survey within three miles of any legal subdivision of a township. We can survey (by saving the money paid for sectionizing) something like four times the number of townships that we can when we use it for sectionizing. Then, if they want more appropriations for sectionizing, the best place to get that appropriation is right there in the township, or in the neighborhood of the township, where there are persons who are interested in having that subdivision made. By a proper system of special deposits, they can have their lands surveyed in the locality that way, or in any other manner the government shall devise. This is the principal idea I had in regard to spending the money that is received for surveys annually; and instead of waiting ten or fifteen years to get through the survey of such public lands as must necessarily be surveyed in California, we can do it in one-half the time.

Q. How much land has been surveyed which has not yet passed out of the hands of the government?—A. I do not know. There was a great deal of desert land surveyed on the Colorado Desert, and some other places where it was very easy to run the lines. In order that they might get their pay under the contract for surveying, they would

bring in the returns and show on the map a large amount of land surveyed. Whether the stakes are there or not I do not know. Since that (that occurred during the first years of the country) I suppose there must have been in different parts of the State a good deal of land surveyed that has not been purchased or pre-empted or homesteaded, for the reason that there must always be in the public lands a portion that is useless. They cannot all be rich and desirable. The surveys would naturally go over a considerable portion of land which would be common, in proportion to other parts that would be surveyed in a township. To pick these out and state exactly where they are and to classify them I am unable, because I have not been during the last ten years in the land business. I have been doing some surveying and examining mines, which has taken me to different parts of the State.

There is another class of land which has been spoken of here which remains in the possession of the United States for the reason that some party has pre-empted all the water which pertains to this land. Take, for instance, a township in Mendocina County. There may be a great deal of desirable timber and sheep and mountain land, &c., and the desirable timber land will be taken up and the other lands adjoining these timber lands (probably good homestead lands) are not taken up, and when you come into what is called the sheep-grazing land there you will find the same reason why the government has not sold all that land, because settlers have gone there and cannot get the water. The streams are taken up by somebody, and they were driven off on that account, so that poor men cannot take these homes which are desirable. The land is counted in these districts as surveyed lands, and, while they have in reality been, no one can settle on them. I think since these old-fashioned desert-land surveys, which were thought desirable land to be surveyed by the surveyor, and which were surveyed many years ago—I think the disposition of the surveyor-general has been to find out where the lands were wanted by the people in the neighborhood to be surveyed, and I think that principle has been followed in the administration of the land office. There has been some difficulty with the surveying. Sometimes the surveyor has sought out a piece of smooth land, where he could make his money under his contract. Those are the actual desert lands, the dry lands. I think there are no places where you can go to survey a new tract without hitting some group of land searchers or settlers outside the boundary line of settlement.

There is one other point I want to speak of. A proposition has been made to apply the geodetic system, or the Coast Survey triangulation system, as it is generally called, to the survey of the public lands. I do not see any necessity for superseding one with the other, but I think one may help the other. In the surveying instructions we worked by years ago we were not allowed to triangulate or shorten the mode of making the survey, except in cases of impassable rivers or inaccessible mountains, but generally we were required to keep the same line, staking as we went. My idea in introducing the geodetic survey is that it should not be introduced for the excessive accuracy which prevails with the coast surveying, but to introduce as an assistant in the rectangular survey. My idea about it is in surveying that if a surveyor has a certain township to survey, and he starts from some established corner, he will very often find smooth hills, from which he can run lines a long distance, and he will find natural points to which he can triangulate. He may find ledges upon the land upon which he can also run triangulation lines to set the evidence of the survey, not attempting to obtain extreme accuracy, but to use the geodetic plan in marking out his prominent points, so that from them he can go with short chaining and establish his township corners. And he can go over there and secure the second corner, which his plat must have shown him is there, or near there, and so on with each corner of the township. In many cases, where he is to go down steep cañons and go up and down hills, he will find that he has got his township in much better form for closure and much better adapted to closing than if he had not had the privilege of introducing the geodetic system where it was needed or expedient. To do that successfully you must employ men who are capable of understanding that system, and men at the same time who are not going to waste their time in excessive minute accuracy. I think if these suggestions which I have made concerning the surveys were acted upon it would facilitate the surveys of the public lands, and leave the main body of the appropriation to be made by the people themselves in the localities where surveying has to be done. I have had in the course of my life as surveyor-general, mining surveyor, and mining engineer to survey by the chain and compass, and thus while traveling around I have had an opportunity to see and become acquainted with, almost all the classes of land that you have in view in your series of printed questions. I have been all over the tracts of desert land or what may be called desert lands, that is desert without irrigation. I have been in many of what are called sage-brush deserts, down in the mountainous portions of the State. I have not settled on this land but I have seen crops cultivated where they got water, and I may profess to be an expert in those matters. On different occasions I have had some experience with people who are occupying unsurveyed lands, and want to keep them in large quantities, and who had in some way put brush fences around the land and thus fenced off every accessible point to per-

haps several thousand acres. I remember on one occasion I sent out a deputy surveyor in the Mendocina County. I sent him somewhere along in October to survey three or four townships. He had not been out very long before a number of stock men who had been herding their cattle there, and who had been there for a long time and had fenced in tracts here and tracts there, in a rude way for the purpose of holding the land as ranchers, came in and complained that these surveyors were in their settling stakes, and subdividing the townships, and that their camp-fires set fire to their grass and they were being injured, and they wanted me to stop the survey. I told them that we were not authorized to stop the public surveys; that they were needed and that many people wanted to take up the lands; that I could not see any good reason for stopping them, &c. They complained that until the rains came they had no places to go to, so I suspended the surveys until the November rains came, and let them then go seek other places. That showed me that there was a good many people on this land who desired to take up large tracts of it, but did not care to pay a very high price for it; but at the same time there is danger that classifying these lands as pasturage lands and allowing them to be sold at low prices in quantities of 2,500 acres, there will be some one who in one way or another will get a good deal of land, and that capitalists may secure a good deal of land and a good deal of water that may be used for cultivation, by taking up land that may be classified as pasturage lands and sold for twenty-five cents per acre. And that is where the government will have to exercise some caution; not that the system should be objected to, but that they should use great care, so that the lands of one class will not, to a considerable extent, get included in another class in that classification.

Q. What disposition would you make of the timber land?—A. I suppose the timber land must be sold in such tracts as will enable capitalists to put up saw-mills and be properly supplied with timber, or there would be danger that the small owners of timber would combine against the saw-mill men, and destroy their whole capital. The suggestion has been made that the timber-land should be sold in 160-acre tracts. I have often thought, in traveling over the timber and watching the manner in which it was secured by large mill-owners, why cannot poor men have some of this land; why cannot they avail themselves of their pre-emption privilege; avail themselves of 160 acres of this land as well as the large landholders, the timber-men; why should they have the whole privilege, and the poor man not have any? At the same time I can see the difficulty of regulating these two classes, the mill-owner and the settler on the small tracts of land. The same difficulty occurred here some time ago, and exists at the present time, between the ditch owners and the mining companies. The ditch owners were one class of men not owning the land, and the mining owners were another class of men wanting the ditch water. The ditch owners began by asking something like forty cents per inch, and afterward they gradually came down to twelve and a half cents; the miners always growling and declaring the price was too high, and refusing to use the water. Then there was a combination of the settlers against the ditch owners, and the case of the strongest came in. Now, that is the same thing that would occur in the timber land unless there was some provision to prevent collision and combinations of some sort. Just what the law should be to meet these cases I do not know.

Q. How would you arrange it so as not to have one right interfere with another; for instance, so as not to have them acquiring large tracts of pasturage lands destroying the right to prospect for minerals, &c.?—A. There is to be considered in this connection a proper guardianship of these lands and their occupation for the uses to which they can be properly adapted; thus the timber lands for milling, the pasturage lands for pasturing, and the mining lands for mining purposes. There is to be considered the difference between our general government and the government of Mexico, and the government of any particular State, as regards the regulation of the mineral land particularly.

Mexico has the law of the Spanish Government, and is expected to be always, by her mineral system and by the long existence of the traditions of her people, the proper guardian over the private interests of her citizens and to distinguish between them; adjust the laws whenever they come in collision, endeavoring always to harmonize the many different interests of her people, &c.

Now, under the Mexican Government, there never could have arisen any controversy over the title to the Alamadan mine, and if a controversy should have arisen it never would have arisen over getting possession of the mine through pasturage title.

There are places here where the pasturage lands and the mining lands lie together, and large tracts of mining land might be taken up as pasturage land. There is a great deal in that idea. There are some things in the Mexican law which might be very well adopted by our government, while at the same time the spirit of our government has been to keep aloof from meddling with private affairs as much as possible.

Q. How would you dispose of the pasturage lands?—A. I would classsify them in each locality and sell them in tracts of a certain number of acres, say perhaps a quar-

ter section, or 1,200 acres, or some multiple of the legal subdivision out and out, and have done with it; but if you want to combine that with another system, and where the mineral lands are allow people to prospect all over them for minerals, you will have to prepare a system which I do not think it is politic for the government to do; that is, a system of holding supervision or guardianship over such of these lands as are not yet appropriated. I think the policy of the government is like that of the merchant who has been out here for thirty years and who wants to close out his business, sell off his goods and be rid of them.

Q. There are in the United States very large areas of pasturage lands; say, fourtenths of the whole area of the United States are valuable only for pasturage purposes. Would you allow a man to take up 40 or 80 acres along the water-courses?—A. No, sir; I would not. I would locate the water-courses and springs in such a manner that every one might have a part to use, and in that way a spring could be utilized for perhaps ten miles around. I should say it would be better to locate the land so that every man might reach the water of that spring. If there was a water front I would adopt a system of ranches along that water front, having them extend back in a long strip, so that each man could have his measure of the water front. That is the way that either the United States or the State government must do to deal fairly with the public; for the moment you allow this monopoly of land, that moment you have given away to an individual some four or five or fifty times the water he should have, and thereby he utilizes large areas of land that he does not own. There has been a great deal of that already done here. The location must be made with discrimination, and then some governing power put in there with discretion to keep these people from taking more than their share of the water. In regard to the guardian powers, the legislative power, and the modification of these land laws, it seems to me that eventually, and before a great while, a State egislature may be found to be the proper place to inaugurate this legislation.

So far as California is concerned the members of Congress who go from this State know very little about the State and its peculiarities. They know very little about this constant collision of water rights and the wants of the dry land and the pasturage land and of the mineral land, as compared with the agricultural land. They know very little of this *débris* question, and they are not fit to legislate on this subject. When Congress legislates for this coast it legislates through a small body of members who do not know much about it; while in the State legislature the whole legislature is posted on the subject, and therefore it would be better if this matter could be regulated by the State.

Q. Have you any suggestions to make in regard to the irrigable lands?—A. I think the irrigable lands must in some way follow the irrigating streams and be attached to them in some manner and by some mode of law which shall give a man who has all irrigable land along a certain artificial water-course the right to always have his measure of the water that flows there. Just in what way that can be done I do not know. Then again, in regard to the control of the irrigable land and the control of the water-courses, it is advocated sometimes that it should be in some general United States system, or the State should control all the irrigable lands in the State. There are certain points which a general State law may arrange or provide for, just as there are certain points which it is the duty of Congress to provide for; for instance, in regard to the commerce and the postal system, or something of that kind; but to make one law which will apply to every irrigating district in the State is not an easy thing to do. I think the general law and the system that was recommended by General Alexander and the commission that sat with him in regard to the irrigable lands of the San Joaquin embodied the correct idea—that so far as possible, under some law, the control of a particular stream of water should be placed in charge of a body of men limited to the charge of some particular water-shed along its entire course. Take, for instance, the water-shed that comes from the Sierra Nevadas, and that water could be placed under one set of commissioners, and they have nothing to do with any other water. They must enforce the distribution of this water and see that the land owners got a proper share of water, and that the water companies shall receive their proper revenue.

Q. Are you familiar with these troubles concerning hydraulic mining?—A. I am not very familiar with it, but I have surveyed hydraulic mines and know many of the principal owners of the State. I am not sufficiently well acquainted with hydraulic mining to be able to testify in regard to it.

There has been a statement made here in regard to the location of quicksilver mines and the disposition of them, and I would like to confirm some portion of that testimony. Quicksilver is not a regular deposit, and should be taken out under the square location. In the manner in which it is taken out at present it is not a profitable operation for the claimant, and he should not be required to testify that it is one vein, &c., because quicksilver is not found in veins. It is not found in regular veins or lodes, running in between regular walls like a fissure vein, nor is it found in stratified formations like coal beds. They are, to some extent lodes, though they are not regular and change very capriciously. Sometimes the deposit follows down on what you might call a reg-

ular dip, but after following it a little way it will turn around and run almost horizontally. On that account it should not be subjected to the law which requires a claim to be taken up in the direction of the vein. There has been a great deal of delay in the matter of the Spanish and Mexican grants. Taking the statement of the people in general, with their complaints of delay in the case of these claims, you might suppose they had some system of settling them in one year, and that if the government would only provide men for surveying the land that it would be done at once. Surveying is the first cure recommended by these people. So far as the government has made preparations for surveying these ranges at government expense it helps very much, especially where the owners have refused or declined to have them surveyed themselves. They have an interest in not having them surveyed, because they were holding under their grants two or three times as much land as they finally got when the claim was settled. During the interim, having no segregation from the public land, they had been enabled to sell quitclaims to the land within these boundaries that were claimed, although they had no title to the land; and hence it is not to their interest to have the surveys made, and they do not want the government to make them. When the government forces the survey upon them, that question of grant boundaries comes nearest settlement. Unless there is some dispute, a claim should go through within a year or two. The ranches still unreserved may be classified into as many as three classes. There is that class that merely requires the paying of a small sum of money to the land office by the owners in order to entitle them to a patent where there is no contest; only a little delay on the part of the owner to pay expenses. I do not know to what extent this class has been disposed of.

There is, next, a set of claims which involve contests of boundaries of disputed ownership, contests arising from overlapping with other claims, &c. These, I suppose, to a certain extent can be adjudicated by the surveyor-general under the present laws, and closed up in that way. There are still others which involve such important questions of litigation and such conflicting questions—that involve not only questions of boundary and surveys, but likewise legal questions that reach back to the jurisdiction of Congress; the jurisdiction of the Land Office—questions of that kind, which will eventually have to come before the ordinary courts of justice, and ought to be sent there from the surveyor-general's office, to be settled under the rules which have been adopted by the court to adjudicate such cases. They ought to be in the ordinary courts of justice, where testimony could be taken and where somebody can enforce the attendance of witnesses. The surveyor-general has no power to issue subpœnas or enforce the attendance of witnesses, yet he is called upon to hear these cases. When I came into this office I found there was something like two hundred cases in the office that demanded settlement. I sent out some thirty or forty cases, but to what extent it has been going on since then I have not known. I have not followed up in the office here the progress of the cases.

Testimony of W. H. Drum, of Marysville, Cal.

W. H. DRUM, residing at Marysville, Cal., testified, October 27, 1879, as follows:

I have lived here since 1857. I came here in that year.

Question. Are you familiar with silting that is filling Yuba River bed?—Answer. Yes, sir.

Q. Please give us a statement of that filling, in your own way.—A. In 1857 I bought a piece of bottom land on the Yuba, and paid a pretty good price, because I thought it was the best land I had ever seen. When I bought there, the banks of the Yuba were from 20 to 22 feet high at low-water. The stream was clear, with plenty of salmon-fish everywhere. My piece of land was two miles from Bear River, and I had no difficulty with the water. The high water of 1853 barely came out of the river channels, over the banks, and filled a few of the smallest sloughs, but it never came up to the ridges. We got no sediment here, as we call it, until 1862. In that year our water was very high, and it covered the whole bottom, in some places 6 feet deep; but it was comparatively clear in appearance. Yet when it went down we found large banks of sand and much of sediment. The current of the Bear River was rapid. After the fine stuff had passed down, the deposit left was chiefly sand, and not a great deal of it. The first flood left very little, but the succeeding ones, afterwards, left more of it. This has kept going on, from time to time, as the river grew riley and thick with mud, during the winters, until it has now covered the bottoms. I had about 1,030 acres and it has covered them. It has been doing that now, from time to time, until it has reached the height of 25 feet. All my places are level. I was over there a year ago, looking for some wild cattle I had in the waste, and I could just trace the line of the telegraph poles. The land has filled up within a few feet of the top of the telegraph poles. I am satisfied that it was not so deep as on the other side. It was only from 12 to 20 feet deep all through that body of land. I had about 90 acres that I protected with levees; the remainder was destroyed eight years ago. In 1875 these 90

acres which I protected with levees were destroyed; the water flowed over the levees and filled the ground over 4 or 5 feet. It did not destroy the levees, but flowed over them, thus destroying the remainder of my land. I had a garden, fenced with a strong fence and posts. The tops of these posts have been 5 feet under for the past six years. They destroyed all my land. My house was 20 feet above the low-water mark in the river, and last winter the water was up to the top of and around the house, and left a sediment of 8 inches. My buildings all set there still, but they are useless. It cost me $3,500 to put them there, and I had to go away and leave them on that land. I raised 94 bushels and 34 pounds of wheat to the acre on that land. That was a sworn statement before the agricultural fair. I had raised 103 bushels of barley per acre. I raised the first grain that was grown this side of Sacramento. All that land has been destroyed; it is nothing but a swamp now, and you cannot go into it to-day. If I had that land to-day, in good condition, it would be worth $175,000.

Q. Can you give the Commission any idea of the extent of the damage to the land on the Yuba?—A. It has been destroyed; it is stripped three miles wide and twenty-two miles long.

Q. To what extent has this sediment invaded the plains land?—A. The water has now got up so that the levees will not prevent it from spreading over ten miles; that is, the snow-water that comes down; and the water is at times 2 feet above the high-land. It is only the levees that protect it from the land, and when it breaks the levees it runs at random over the plains for five miles.

Q. Taking a flood similar to the one of 1862, what would be the extent of the overflow and sedimentary deposit at this time?—A. If we had the water come down as it did in 1862, I think it would sweep these levees by the board, and the water would come from the foot-hills at Auburn to the Sacramento River. I do not believe there would be any land that would not be under water. The water ran at that time 6 feet over the land, and the current there was rapid; but now it runs slowly and the channel is entirely obliterated. No man can tell now where the old original channel of the river was. The country then was covered with farms; now it is a wilderness of willow trees, through which a man would have difficulty in finding his way. There was not a shrub on the land then 3 feet high where it was cultivated, and that was the case with all the land around here. There was the Briggs orchard, which was supposed to be worth $300,000. It is not worth anything now. Hundreds of cords of wood were cut off it a few years ago. There was no willows on it in 1862. There were a great many trees in his orchard, and he made a great deal of money out of it, until the *débris* came, when it was destroyed. It is now a wilderness of willows.

Q. Is that deposit of benefit to the soil as a fertilizer?—A. I have found this deposit to be no less than a poison. I have experimented with it for twelve years, and I have not been able to do anything with it. In five years they must put other levees where the levees are now, because the *débris* is rising 2 feet a year. Opposite the mainland there are four different channels. In this sandy waste, where nothing will grow, the sand is about 26 feet deep, and perhaps 30 feet. There was formerly only one channel where there are now four. The *débris* fills in and the water cuts another channel. In some places in cutting new channels buildings are swept away. This riley water will weigh 11 pounds to the gallon, while clear water only weighs 8 pounds. In the summer-time it is heavier and thicker. In summer it will weigh 12 pounds to the gallon; that was the difficulty with the levees last year. Their owners calculated for the winter water, and the summer water was too heavy for them to withstand it, and their levees were destroyed. I have tested it often in different ways; I have fought the water year after year, and it has driven me steadily back, until I have lost all my land. I have put in crop after crop, and the water would steadily destroy them, until I was driven away. Many other persons, like myself, have spent many years on their farms and have built levees, but when a freshet came they would be destroyed also.

Q. Are you acquainted with Feather River?—A. I am well acquainted with Feather River and have been for twenty years. It has filled 8 feet. There is not so much mining on that river. The greatest damage is done on the Feather, Yuba, Bear, and American Rivers.

Testimony of Thomas J. Filcher, Marysville, California.

MARYSVILLE, CAL., *October* 28.

THOMAS J. FILCHER made the following statement:

I have resided here for twenty years. In the fall of 1860 I purchased a claim where the Dry Creek empties into the Feather River. I gave $2,000 for two hundred acres of land. It was considered at that time one of the nicest little places in the country. There was no title to it, as the land was not surveyed. The first injury it received was in 1861-'62, when the large overflow came, and since that time the injury has been increasing and the value of the land has decreased till now not an acre can be culti-

vated. It has all been destroyed, not directly by the *débris*, but by the water backing up from Feather River. The water backs up and stays upon it so long that it cannot be cultivated. That is about a statement of the condition of my place. Now there are other farms in the vicinity which are in the same condition. Mr. Barry adjoins me, and he is suffering from the same trouble. All this land was for grain-raising purposes, and since that time I got a patent to the homestead, but before I abandoned it I changed the homestead for the piece of land on which I now reside. It is on higher ground. In consequence of this change I was compelled to tear down my barns and outbuildings and rebuild my house. That was all in consequence of the overflow.

Question. What is the area of the overflow by the backing up of Fall River?—Answer. It is very large. I should think it amounted to perhaps a thousand acres; that is above my place one mile, where it spreads out. There is one circumstance that I would like to make known concerning this. I have had an opportunity to know the facts about it; it has been stated to this Commission. I see from reading the testimony that a great deal of the *débris* that has accumulated in the rivers is washed from the agricultural ground, and that but a small proportion of the *débris* comes from the mines. I am so placed that I get an opportunity to test that matter. Dry Creek branches off up toward the foot-hills. On this branch there is no mine, so that whatever earth comes down from that branch would be from the agricultural land. There is no *débris* from this branch. In winter there is a great deal of water that comes from the branch, but there is never any *débris*. This branch and Feather River meet, so that the water stands still. If there was any solution there it would be desposited, but there is no sediment on my land. That is positive evidence that there is no earthy matter brought into the river from the wash from agricultural land. If there was it would settle on my land, but it never settles there. Sometimes there will be a little scum, which shows that it is in consequence of the water from Feather River mixing with the other water where they meet. My land is injured by the water standing on it so long, but it is not injured by the *débris*. It will remain there all the year sometimes, and sometimes from six to ten months. Mr. Robinson makes a statement I saw that there is about twelve million cubic yards washed from the mountains, and 95 per cent. remains in the cañons; but it appears to me that if that was reversed it would be a more accurate statement. Ninety-five per cent. of twelve million cubic yards would soon fill up the cañons, and I think the estimate should be reversed. There is adjoining me large bodies of land that is in the same situation as mine. It is all cultivated land of the best quality that is destroyed in this manner. The owners have all spent large sums of money for leveeing. A neighbor of mine has just lost $12,000 by the breaking of the levee. This water did not destroy his land by depositing sediment, but by the backing up of the water and the overflowing of it.

Q. When did hydraulic mining commence?—A. I am not well enough acquainted with it to say, but the first years I ever received any injury was in 1861–'62.

Testimony of Daniel Fraser, of Wheatland, Cal

DANIEL FRASER, of Wheatland, Cal., testified at Marysville, Cal., October 27, 1879, as follows:

I came to California in May, 1852. I have been farming since 1853. I was one year in the mines. Where I live now I have farmed ever since 1853. I have cultivated from 200 to 600 acres of land every year, more or less. It would average 300 acres. I live on a tributary of Bear River. Formerly it was a part of Bear River, and at high water the two streams mingled. That was in 1853. I bought my land from Henry E. Robinson and A. W. Von Schmidt. When I bought the land from Mr. Robinson in 1856 I bought 160 acres. I was on the land before I bought it from him. When I bought that land he offered me 600 acres of high land at the same price that I paid for the 160 acres, and I would not accept it. I would not have had it then as a gift. The reason why I bought this low land was because it was bottom land. I did not want the plains land, which we call red land. I have farmed that land, and I find that the banks of the stream are a little higher than the land, which gradually slopes back from the line of the stream. I have lived on that and farmed it ever since. They have been mining since 1852. The first thing I saw when I came into the country was the mines. They had been washing with long toms—that is, the short sluices—and they washed I could not exactly say how much. There must have been 160 acres of land washed, all told. It will wash on an average 18 inches in depth, and the tailings run into the stream or creek that I live on. Every winter that has been the case. When they could get the water the depth of the washing has been 18 inches. The tailings all went into Dry Creek, and it has never filled the creek one inch. This wash-

ing is on surface ground, near Dry Creek. Sluice mining never fills up streams. I crossed Bear River in May, 1852, at Johnson's crossing. The stream was clear water. We had to get out at the time and walk up the banks of the stream. Coming up out of the bed of the river to the banks, I should say they were 12 or 15 feet in height from the bed of the river where we came out. The bottom of the river was gravel. I was at Camp Far West, at the mouth of Bear River, near where it comes from the mountains, in 1852. I did not go back again until 1858, and it was still the same there, not filling up at all. I saw, however, that the water was a little riley, but the rocks were still the same on the Bear River. I did not get there again until ten years afterwards—1867-'68. The bank that formerly was 20 feet high was covered up, and I did not know the place. I asked a man where a certain house was. He replied, "There it is." There were willow trees on the place where the house had been. I was there again last year, and where Camp Far West had stood the ground was filled up 30 feet. The camp is there no longer.

Question. To what extent has farming been destroyed on Bear River?—Answer. I should think that from fifteen to eighteen thousand acres has been destroyed.

Q. How much on the Yuba River?—A. I cannot state. Not more than that on Yuba River; and it is wider on the bottom.

Q. Are you acquainted with Feather River?—A. No, sir.

Q. What is your judgment as to the value of slicking as a fertilizer?—A. It is very poor. I have seen land on Bear River, upon which the flood came in 1862, which was the best land I ever saw. But since the flood of 1862 it has never raised two stalks of corn.

Q. If the land is covered the depth of the plow by these slickings is it productive at all?—A. No, sir. I had it on my place in 1862, and I have got that land into cultivation by plowing deeply and manuring it. For the first six or seven years it never raised a single thing, but by plowing it 18 inches deep and manuring it, it now raises a crop.

Q. Can you indicate the condition and character of the land which is now threatened with destruction from this cause?—A. The bottom land has been entirely destroyed, and it has now commenced to cover up the plains land.

Q. If you had such a flood as you had in 1862, to what extent would it come over this valley, in your judgment?—A. It would come over this valley of the Bear River and run ten miles over where it is at the present time, toward the Sacramento. It would run at random all over the valley. I was here in 1852 at the high water, and in 1853.

Q. When a flood of that kind spreads over the land and leaves an incrustation or sediment, what is the character of that sediment? Is it hard or sandy?—A. It is sandy; it is a kind of white crust. I do not know what it is, but it comes on the top of the soil.

Q. Is it a hard crust?—A. No, sir; it cracks open; and that is what they call slickings. I have been acquainted with the land along the course of the river when it was the finest land I ever saw, and when it raised two crops a year—a crop of grain and a crop of corn; and I have seen better vegetables raised on Bear River in 1854 than I have ever seen since.

Q. The farm-lands on Bear and Feather Rivers have been pretty much all destroyed, have they?—A. Yes, sir.

Q. The character of the land now threatened is the higher plains land, is it; and that represents the entire valley?—A. Yes, sir. Formerly, where my house stands, we put a spirit-level to the bottom of the levee, and the line just struck the sill of my house. To-day it strikes the top of the levee and the eaves of my house. The water to-day would break over my house if there was a flood. The bed of the river is pretty well up to my windows now. In 1852 I went to Bear River to see the stage of the water. It was pretty high. It had run over the banks, and these sloughs drained off the extra water, and it went down, and left no sediment; but now the sloughs through which the water used to run and the little feeders from the hills are all filled up with sediment; and willow-trees alone grow there, with a few cottonwoods. As to the land along the Yuba and Feather Rivers, I know something about them; and the land down the Feather River, toward the mouth of the Bear River, is filling also. There used to be, in 1852, as fine ranches as I ever saw at the mouth of Bear River; and to-day it is a barren waste. There was a thousand acres of fine land there then, and the destruction has all been caused by hydraulics. The surface of the earth that was washed from the foot-hills was from eight to fifteen inches deep, and went right into that creek. When the water came up and overflowed the land it did not injure it a bit. The *débris* from the sluice-minings seems to be of a material different from that of hydraulic mining.

Letter of Robert Gardner, of Oakland, California.

OAKLAND, CAL., *December* 1, 1879.

To the honorable Commissioners of the Public Land Commission, appointed under act of Congress approved March 3, 1879:

GENTLEMEN: In pursuance of an invitation from Hon. A. T. Britton, a member of your commission, to express my views upon the laws regulating the sale, settlement, survey, classification, and irrigation of the public lands in the State of California, I submit the following statement relating thereto. The opinions and suggestions embodied herein have been formed from a residence in this State of twenty-two years, and from an active interest in and contact with the public land service of the United States and the State of California for a period of over seven years, both as register of the Humboldt land office in California and as State surveyor-general.

From careful estimates, the surveyed and unsurveyed area of the State of California consists approximately of 100,500,000 acres. Of this amount probably 12,500,000 acres are embraced within mining claims, private or Mexican grants, mission church property, Pueblo lands, Indian and military reservations, lakes, bays, navigable rivers, swamp, overflowed, and tide lands, leaving about 88,000,000 acres of public lands to be disposed of by the United States. Of this 88,000,000, about 50,000,000 acres have been surveyed. The great and productive valleys of this State, the grazing and timber lands have nearly all been surveyed, as well as several million acres of the dry and arid plains situated in the counties of Kern, Los Angeles, San Bernardino, and San Diego. But a very small portion of the residue of the unsurveyed area of California, something over 38,000,000 acres, can be utilized by the settler, or by those persons seeking homes on the public domain. For the most part the unsurveyed area of the State of California consists of the four following divisions, viz:

1st. Those bleak and barren portions of the Sierra Nevada and Coast Range of Mountains entirely destitute of vegetation and timber.

2d. The desert and arid lands in the southeastern part of the State.

3d. An occasional small mountain valley.

4th. The grazing districts of the foot-hills, not heretofore surveyed, which includes some oak and pine timber lands.

The selling of the grazing lands of this State to purchasers in large tracts has been a theme of fruitful discussion. My experience leads me to believe that all the grazing lands in California of any value will be purchased by actual settlers as the State increases her population. A number of years ago, while register of the United States land office for the Humboldt land district in this State, I was informed by stock men holding large tracts of grazing land unsurveyed in what is known as the Bald Hill district, lying in the counties of Humboldt and Mendocino, that "if these lands were surveyed only forty-acre tracts would be purchased, or those subdivisions possessing living springs." On my application to the United States surveyor-general for California these lands were surveyed by the United States during the years 1872–'73–'74–'75. The records of the Humboldt and San Francisco land offices will show that thousands of actual settlers have taken advantage of this opportunity and settled upon these lands. In fact, as far as those lands have already been surveyed they have been utilized by actual settlers for stock raising, orchards, and vineyards. I believe it to be opposed to our theory of government to allow an individual to acquire and control large tracts of land (not desert), and that the people will be greatly benefited by the distribution of these lands through the hands of many small owners; and that the country will gain more by such widespread industry than it can from the sums that may be realized from the sale of these lands to parties not residing on the lands in question. The great need of this State at the present time is an increase of the number of small landholders.

No more "*scrip*" of any kind should be allowed to be located on the public lands. Most all the "*scrip*" heretofore issued has been conceived in fraud, and located under the rules and regulations of the Land Department without authority of law. It seems to have been the policy of the Land Department at Washington to so incumber the homestead and pre-emption settler with useless rules and regulations, also local land-office fees, that the land which the settler has in contemplation must possess an intrinsic value of from $3 to $5 per acre in order to cover the first cost and various expenses. At the same time extraordinary facilities were allowed the holders of *land scrip* to make their wholesale purchases of the public domain.

Several million acres of surveyed land situated on the western slope of the Sierra Nevada Mountains are practically reserved from sale and settlement by the action of the department at Washington in suspending the maps of the same, and declaring them to be *mineral lands*. These foot-hill lands are valuable for grazing, orchard, and vineyard purposes. This mineral suspension should be removed except where shown to be mineral on the maps by the survey of the United States deputy surveyor; and the settler not compelled in order to obtain possession to incur the expense of produc-

ing testimony in order to show that the land in question is not mineral. When a patent is issued to a pre-emption or homestead claimant on the public domain it should be without any reservation of mineral that may hereafter be found upon the land. Without an absolute title the claimant possesses no security for making permanent improvements upon the land.

SURVEYING THE PUBLIC LANDS.

As to the method of the survey of the "public lands" in California, I would advise that the *rectangular system* of surveying adopted by the United States in subdividing the public lands in its present state of perfection be adhered to. This method is the best and simplest that could be devised. The existing system is the result of many years' trial and experience. The contract system is the best, if faithfully executed, but has been shamefully abused in this State It is an undisputed fact that several million acres of land already surveyed in California can never be sold either to actual settlers or speculators, as these lands are entirely destitute of vegetation and not susceptible of irrigation. They possess no value for any purpose whatever. The object of their survey has been simply to exhaust the yearly appropriations made by Congress for the survey of the public lands in California. Lands are being surveyed in this State regardless of their character and adaptability for sale and settlement. This is not the fault of the law, but of those in authority under whose jurisdiction these matters belong. The United States laws and the Surveying Manual specifically declare in what manner and what class of lands should be surveyed. It requires no topographical or geological survey of this State to determine the class of lands that are subject to survey. The appropriation act authorizing the expenditure of money for the survey of the public lands in the State of California specifically declares what classes of land should be surveyed, viz:

1st. Those adapted to agriculture without artificial irrigation.

2d. Irrigable lands, or such as can be redeemed, and for which there is sufficient accessible water for the reclamation and cultivation of the same not otherwise utilized or claimed.

3d. Timber lands, bearing timber of commercial value.

4th. Coal lands, containing coal of commercial value.

5th. Exterior boundaries of town-sites.

The survey of mining claims is provided for under the special deposit system. It will be seen that Congress in its wisdom provides for the survey of all lands in this State that can be of any benefit or practical use to its people, *and endeavors* to protect the national Treasury against the wasteful expenditure of the public moneys in the survey of bleak and barren mountains and desert wastes. I respectfully invite the attention of your honorable commission to the manner of the survey of public lands in California, and the evasion and abuse of the laws relating to the same.

I would suggest that all the timber and grazing lands which remain to be surveyed should continue to be sectionized as heretofore and platted the same as agricultural lands. The same laws now apply, and should apply, to their sale and settlement. The present system of surveying mining claims by authority of the United States surveyor-general should be continued, as this method is in an advanced state of perfection.

I would guard the rights of prospectors and miners seeking mineral deposits upon the public domain. They precede the agriculturist, the stock raiser, and the fruit grower. They have been and continue to remain the advance guard in the settlement of this State. They are entitled to liberal laws and an impartial rendering of the same. The miner, as well as the agriculturist, should be allowed the privilege of using all the timber necessary for actual development from unsurveyed land *without restriction.*

MINING AND MINING LAWS.

The mining laws for the government of quartz mining should be amended in this: that the miner should have the right to follow the ledge or vein, with all its spurs, dips, angles, and variations, to any distance, without regard to surface ground. Without this right the miner has no security for deep mining, and may expend a fortune in finding the true course of the vein only to discover that his own location embraces but a small portion of the lode, and the adjoining claim, upon which not one dollar may have been expended, will receive the entire benefit of his discovery and investment of his time and money. The old miners law was enacted on this theory, and is right and just; and the spirit of our government in dealing with mining claims should be more in harmony with the old mining laws, which gave the locator his ledge and the right to follow it down at any angle the vein might take and wherever it might lead. A recognition of this right by the government would relieve discoverers of true fissure veins of costly litigation arising in cases where a portion of the vein or lode passes beyond and lies without the exterior lines of the surface ground. Square loca-

tions of mining claims cannot be adopted where there is a true fissure vein, with its dips, spurs, and angles, but may be seriously considered in those mining districts where the limestone formation prevails, and where the deposits of ore are found in large and small bodies, *and where there is an absence of a true fissure vein.* All controversies over mining titles should be settled by the land department, which consists of the Secretary of the Interior and the Commissioner of the General Land Office, and the contests should be governed by the same rules and regulations that determine the settlement of other contests before that department, without the interference of local State courts. A vast amount of litigation has been occasioned where the imperfect records of old mining districts, for which no titles have ever been issued, and long since abandoned, would be brought to light as against subsequent locations made many years after, and where large sums had been expended in developing these subsequent claims. In view of this fact I believe it to be in the interest of those making mining a business that all local mining laws should be abolished, and subsequent locations should conform to uniform United States statute laws and be governed by the rules and regulations issued in conformity therewith by the authority of the Land Department. There should be a limit of time in which the locator or mine owner should be allowed to apply for and perfect their titles to their claims. This limitation of time should not extend over two years after the notice of discovery has been posted on the claim. To a certain extent the same laws should govern this limitation of time as are now applied to pre-emption and homestead claimants. It is for the interest of both the government and the State of California that titles to mining claims should issue as rapidly as possible to all *bona-fide* claimants. As the mining interests of the United States are so extensive, and in many States so important, it is very probable that in the near future a "mining department" will have to be created in order to render justice to this valuable and rapidly increasing branch of our domestic revenue. The facilities afforded by the Land Department at the present time for the settlement and disposal of controversies arising from mining litigations are totally inadequate for a proper and comprehensive adjudication of the same. "The means to the end" would be the appointment by the President of a "commissioner of mining," whose official actions should be subject only to appeal to the Secretary of the Interior.

TIMBER LANDS.

Timber on surveyed land should be sold to the people in tracts of not more than one hundred and sixty (160) acres to each purchaser at not less than two dollars and fifty cents ($2.50) per acre. The laws providing for the sale of these lands should be liberal in their operation, and should not require settlement. The enactment of such a law would be the means of converting rapidly all the valuable timber lands surveyed, or to be hereafter surveyed, into private ownership. The passage of such a law is absolutely necessary in order to protect the unsold timber lands from waste and destruction. The timber lands are one of the important sources of our natural wealth, and should be protected for the benefit of future generations.

IRRIGATION.

The majority of immigrants coming to California are farmers in quest of public lands available for agricultural purposes. The tendency of this immigration, until within the last three years, has been toward the southern portion of the State, comprising the counties of Fresno, Tulare, San Bernardino, Kern, Los Angeles, and San Diego. The average rainfall in these counties is less than in the more northern portions of the State. The greater part of the bottom lands, naturally irrigated by overflow and percolation from the rivers, was either taken by Spanish grants, or has been secured by settlers under the various laws for that purpose. The remaining lands of the valleys of the southern portion of the State are equally fertile in character, but unavailable for profitable agriculture without irrigation. Under the laws of California, enacted at an early date, when mining was the prominent industry of the State, water rights were allowed to be acquired, and the water diverted from the natural bed of the streams. This claim and appropriation of water has been recognized as a legal right without regard to the riparian rights of the occupants of the land living below the point from which the water was diverted. The result of this system is that all the available waters of this State are covered by some kind of claim possessing more or less legality. Should our present system continue, and these claims to water be further recognized, in a few years a system will grow up different in form, but practically in effect similar to that which prevails in countries possessing laws of primogeniture and entail. Vast tracts of our lands are worthless without water. The settler may own the lands, but if the water and the price of its use lies within the control of another man who may at will withhold it from him or levy a price upon its use suicidal in its effect upon the profits arising from the cultivation of his land, he will occupy a position similar to that of a tenant at will, who turns over his whole produce

to his landlord, after deducting the amount consumed in producing it. This condition of things is sure to exist in the near future, unless remedied by prompt action on the part of the legislature of this State. Land and water should be inseparable where the land in question is susceptible of irrigation. I am well aware that this problem of irrigation is one of great complications, involving, as it does rights already acquired, the disturbing of values already created, and the adjustment of rights that have not yet accrued. I would therefore suggest that, as far as I have given the subject thought, it would seem that the better plan would be for the legislature to appoint a competent commission to make an examination of all the streams of water available for purposes of irrigation in the valleys, to create irrigation districts as extensive and as numerous as each stream will irrigate, and with power to obtain water rights already acquired on these streams by purchase or condemnation. I believe some plan which involves these principles, if enacted into a law, will avert the evils which seem to threaten the farmers of California in connection with this subject.

DESERT AND ARID LANDS OF CALIFORNIA.

As before remarked, there are millions of acres of desert and arid land in Southern California. The ancient records of this State show that ever since the settlement of the country by the Spaniards the rainfall has been very light and seasons of extreme drought have been frequent. Wherever the old missions were established in that section of this State it is shown that ditches and extensive canals had been dug for the purpose of irrigating the lands upon which they depended for their support. Though many of these canals have long since been abandoned they can be traced over many portions of Southern California. There is no question as to the fertility of these arid and desert lands if properly irrigated, and where so irrigated will yield abundant harvests. The question of irrigating the above-mentioned lands is one of great importance to the interests of this people, and one which is attracting great interest among men of capital and intelligence. Every effort put forth to increase the area of agricultural land by the irrigation of these desert lands in this State should receive the hearty support of the State and national legislature. Every man who directs his attention and money to the praiseworthy object of reclaiming these lands is entitled to the just term of public benefactor. This reclamation of desert lands by means of irrigation can be only accomplished, *as a general rule*, through the agency of organized bodies of men, possessing large capital. It should be the policy of our government to grant title to the lands in question to those persons who will provide for a complete irrigation of the same. This class of lands possess no value at present, and never will possess any while they continue to remain in their present condition. I would have the government determine by geographical survey of our State just what portion is desert land, and for which there is sufficient accessible water for the reclamation and cultivation of the same. Congress passed a law March 3, 1877, relating to desert lands in California and other States, providing for their sale and reclamation. This law was imperfect in many respects, but was all that could be expected, as the nature of the country to which it applied was not fully understood by our national legislators. Under this law numerous irrigation canals have been constructed in the Tulare and Kern Valleys, and large tracts of land have been completely irrigated, and a large extent of country has been thrown open to cultivation which heretofore was a desert waste. In some cases these lands have been reclaimed by farmers, who organized and expended large sums of money to conduct the water from the streams to their lands; while in some cases capitalists have undertaken the reclamation of these lands by irrigation, with successful results, after the expenditure of immense sums of money. I would suggest that a law should be passed providing that individuals should be allowed to take up these lands in large tracts at the nominal rate of 25 cents per acre, on proof of complete reclamation by means of the irrigation of the same. They cannot be profitably reclaimed in small tracts of 640 acres. That section of the law of March 3, 1877, restricting the sale of desert lands in tracts of 640 acres should be amended. This restriction has delayed materially the reclamation of these lands and been the means of preventing capitalists from investing their money to a greater extent. An individual who will make one blade of grass grow where none has ever grown before is a public benefactor, and the government should donate to him for a small compensation all the desert and arid land that he will successfully reclaim by the irrigation of the same. I would have the proper safeguards thrown around this law, and would make it impossible for the speculator to purchase an acre of this class of land until he had filed indisputable evidence with the proper officers that he had fully and completely reclaimed the same by irrigation as shown by growing crops. In this way the water is rightfully used, and the desert is made to produce crops where no green thing had ever grown before. Legislation by Congress providing for a speedy settlement of this question of water rights and desert lands would be of great benefit to the people of this State.

With these few brief and general remarks and suggestions upon the sale, settlement,

survey, classification, and irrigation of the public lands in the State of California, I have the honor, gentlemen of the Commission, to remain,

Yours, very respectfully,

ROBERT GARDNER.

Testimony of Hon. William M. Gwynn, of San Francisco, Cal.

Hon. WILLIAM M. GWYNN, of San Francisco, testified, October 9, as follows:

Question. What is the best way of utilizing the timber lands?—Answer. As regards the timber lands of this State, they are of course important, not only to the State, but to the whole country, and for thirty years they have been constantly destroyed, for want of proper attention on the part of the government; and if there is not some additional legislation on the subject they will ultimately be all destroyed. My judgment is that the government ought to have supervisors or foresters to protect these lands from depredations. Each one should have a range or district which should be well known, and their authority should be well recognized. If they are interfered with it should be understood that the law was being violated by such interference. These timber lands have at all times been very troublesome. When I was a planter in Louisiana, we used to have our levees threatened by timber men who used to raft their logs down the river. There are the same kinds of depredations here; the waste is absolutely enormous, though I do not know so much about it as I did years ago. For twelve years I was canvassing the State among the mountains and have seen the most horrible destruction of timber that could be witnessed almost anywhere in the world—great trees cut off and the butts used and the balance left on the ground. We have timber enough here to last until Gabriel blows his horn if it is taken care of; but it has not been taken care of since I have been in the State. I would have these foresters sell the timber by stumpage and have the title to the lands remain in the hands of the government. Every tree that should be sold should be sold for some useful purpose. If the government will not protect the timber, they ought to sell the land. They ought to sell it in a way that will enable people to buy it for proper purposes, and not for speculation. My son has a very large mining property where he has to use a great deal of timber, and he is now rafting it down the Columbia River. Last year he pre-empted some land there, and he took it up under the school section. He secured this land up in the mountains in order to raft the lumber down to his mines. It is becoming such an important question to the miners that wherever they can't secure a portion of this timber land that they can look to in the future for mining purposes, they will, I think, be reduced to the necessity of stopping their mills. This I know of my own knowledge. The destruction of the timber is due far more to wanton carelessness and waste than to utilization. The timber is being taken off in such a way as to leave a large part that is not utilized. I do not think the virgin forest is injured much by fires. It is the trees that fall and decay that are easily ignited. The hunters and stockmen are careless and let the fires get in. If the timber was cut off, the land could be used for pastoral purposes. Where you strike the snow-belt, high up in the mountains, the land remains in the hands of the government; below the snow-belt it should be sold, and I think the land ought to belong to the State, because the State can utilize it better than the government. No one person should be allowed to take more than one-half section of timber land. We ought to guard against taking the land in large quantities. I would make the mill-owners buy the timber from the land-owners and I would not allow them to monopolize the land and the timber. It would be better for the mill people to buy the logs outright than to sell them the land. That is a matter of experience. My son would rather buy the logs than cut them for himself. He can buy them for a great deal less.

Q. What system would you suggest for getting irrigable lands and getting them covered by actual settlers?—A. I do not think it is possible for the government to get any advantage from the irrigable lands, for such lands cannot be made available for crops unless they are irrigated, which is so expensive that people can't afford to pay much for the land. There are large quantities of irrigable land in this State which could be irrigated, and there is plenty of water for that purpose if it could be secured. They are now entirely worthless, but with irrigation they will be among the most productive lands in the State. I do not think a system of irrigation can ever be established here that will be effective, unless it is done by the United States or by the State under a national or State system. The United States cannot directly do it, because that would make a precedent for other improvements in the State. It can be accomplished by the State, but, under the present circumstances, I do not think there is very much prospect of ever utilizing these lands by a public system of irrigation. Private individuals can't do it, and it will have to be done by driblets.

Q. What would you do with the pasturage lands?—A. When I was in Congress, many years ago, we had that question up. There had been lands opened to pre-emp-

tion at $1.25 per acre for years, and nobody would buy them, because they were not worth it, and we introduced and passed a law grading the price of these lands, grading them down to a nominal figure, and they were all purchased, and now some of these lands are worth from ten to twenty dollars per acre in the State of Mississippi, and it is looked upon there now as a great monopoly; but this system of granting lands to railroads I have always fought for, because it brings in the railroads. These lands must be graded in price to make them utilized by the people. I would limit the quantity of land a man could purchase. You can't raise stock unless you have large quantities of land. One section is worth nothing for pasturage purpose.

Q. What would you do with the irrigable land?—A. The present pre-emption and homestead laws should prevail in regard to irrigable lands, because they can be utilized for agricultural purposes, but land fit only for grazing purposes I would sell in large tracts, in which latter class I would not include any land that can be redeemed by possible irrigation. I think the settler ought to be allowed to take up large tracts of this pasturage land, and occupancy of it should operate in the same way as improvements on agricultural land. I would leave the disposition of this land a matter of private enterprise, because, whereas one man would have to have a certain amount of this land, another man would require a much larger amount. There is a very objectionable uncertainty about the ownership of the school sections. The supreme court of California has decided that the act of Congress gave the school sections to the State, and the government of the United States has never tested that decision, and it stands on record now that these lands belong to the State; but it will remain an unsettled question until the government of the United States tests that decision or acquiesces in it. I drew the law (I was in Congress then) under which this privilege was given. Literally, it is the reading of the law that these lands belong to the State. The executive branch of the government takes the other ground. It ought to go to the Supreme Court of the United States and have it decided. We have made application for these lands as timber lands, but do not know whether we have the right to cut the timber off them or not.

Q. Do you think that the water should become a property severed from the land, or should the right to the use of the water inure in the land where it was first utilized?—A. I would not like to give an opinion on that question. One man's opinion does not have any effect. Under the constitution which has been adopted we have appropriated the water rights to the State, and whatever a man's opinion may be, we have to accede to that. I will say, however, that I have my doubts whether or not it will be best to give the owner of the land the control of the water. I think it would stop enterprises of the greatest possible consequence. I do not think any system of irrigation can be made thoroughly effective in those portions of the State where the lands are unreliable to make crops without irrigation, unless it is done by the United States or the State. It requires to be done on a large scale, and needs a great amount of capital; and I do not think private capital can be so centered as to make a system of irrigation, therefore it has to be done by driblets.

Testimony of Arpad Haraszthy, San Francisco, Cal.

ARPAD HARASZTHY, president of the Vineculture Association of the State of California, testified at San Francisco, October 13, 1879, as follows:

I wish to speak in relation to the vine-culture in California. I can state, approximately, the entire quantity of land in the State, and how much there is that is good for vine-culture. The best lands for vine-culture are not yet taken up. They are too poor for anything else, and they have been neglected heretofore for that reason. The chaparral land in the foot-hills are the best for vine-culture. Such lands as those I have mentioned are not good for pasturage, and are entirely unfit for the raising of cereals of any kind, because crops will not grow upon it. These lands are so poor usually and so very steep that you cannot use farming machinery; you can barely use a plow. They usually lie at a low altitude; you will find them on the coast not higher than 500 or 600 feet above the sea, and when you go into the interior you will find them from 2,000 to 3,000 feet above the level of the sea. These lands are composed of red earth, mixed with clay and gravel. They are the best lands for vines. They are called red lands, and they must have a great deal of gravel and iron mixed with it. It does not require that this soil should be very deep. Two or three feet of soil is a very good depth. We have some land like that in Sonoma, which is about 800 or 1,000 feet above the level of the sea.

You only find bunch grass here and there, probably not more than a hundred bunches of grass to the acre. It is only fit for growing rabbits. There are millions of acres of that land that will do to raise vines upon, and it will be the richest land we have for that purpose. Then the Mojave Desert (from what I have seen of the cli-

mate) will grow grapes. They tell me there is an enormous rainfall there sometimes. It requires very little moisture for grapes, not more than 7 or 8 inches during the year.

The vines will thrive better in a dry year and even two dry years than they will in one wet year, and bear grapes very abundantly. The vine takes as much nourishment from the moisture as from the soil; of course it impairs its growing qualities and its productive qualities. A moist climate will produce more grapes to the acre than a dry climate, but even the minimum of production is a paying one in this State. These lands are all dry, and they have produced grapes in great profusion. They are larger and have a richer flavor than those growing immediately under a hill, and the crops ripen all the year. In my judgment the land in the northern portions of the State would not be better adapted to grape-growing than in the southern. The foothills at a high altitude in the northerly part would make the light wines, and the grapes in the southern part of the State will make the heavy wines and raisins.

Question. What is the highest altitude at which you can grow grapes?—Answer. I have known grapes to grow well at an altitude of 7,000 feet. I think it is best between 1,800 and 2,000 feet. I have seen grapes growing at that altitude—*i. e.* 7,000 feet—which made very excellent wine, and from that down to 30 feet above the level of the sea, practically at the sea level. A great many vineyards in Sonoma and Napo Counties, down in San José, will grow at a less elevation than about 100 feet above the level of the sea. Sacramento County is about 120 feet above the level of the sea, and the vines grow there luxuriantly. Of course there is a distinction in the quality of the vines; the higher they are the finer they are, even up to the altitude I have named. I cannot answer for anything above that.

Q. What proportion of the State will bear these vines?—A. It has been variously estimated, but there is about 40,000,000 acres of vine land in this State. More than two-thirds of it is this kind of land that I have spoken of, and I think there is more poor vine land in the northern part of the State than in the southern; that is, above the lines of Monterey. I believe that more of the lands of which I have spoken is above than below that point. There is probably no portion where the grapes will not grow, except it is on the western slope of the Sierra Nevadas, because fogs and frosts come in on the western slope of the Sierra Nevadas, where they are any distance from the coast, say twenty miles; they will grow from there clear to the interior, and they will thrive with three inches of rain one year if they have more rain the next year.

I was engaged in vine culture some years ago and had one of the largest vineyards in the State. I got my education in France. I was secretary for a commission which was sent out to Europe to get grapevines, and I passed through the grapevine regions of Europe. In my opinion, so far as my experience has shown me, our production, on an average, is about double per acreage that of France, and I think we have got fully as much, if not more, ground that is adapted to grape culture than France has. I think we can make from two to three times as much wine as France can, if we plant the same acreage. We are producing very little wine here. I do not think our production is over 7,000,000 of gallons, and we have a capacity for producing over 10,000,000 of gallons. We would be able to produce after three years' time 30,000,000 of gallons of wine annually. We have crops enough to make 20,000,000 of gallons annually. The annual production in France is 1,500,000,000 gallons. If you will put an average on that production and compare it with our production, in proportion to the acreage you will find our production far ahead of theirs.

Nine-tenths of all the wine made in France will not stand shipment, and will not keep over one year; it is generally drank in the immediate vicinity of where it is made; whereas I have failed to see, in the last sixteen years that I have given attention to the subject, one gallon of California wine that would not keep and stand shipment to any portion of the world and be improved by that shipment. Our wines keep under adverse circumstances and bear handling, and theirs do not keep with the utmost care and the best of handling; the reason being that our grapes contain an abundance of saccharine matter. You will find wines made from grapes in France containing as low as 8 or 9 per cent. of alcohol. With us it is very hard to get wine that contains less than 11 per cent. of alcohol, and the average is 12½ per cent. This is why our wines are said to be harsh. Considerable age will of course improve and mellow them. Capital has been so high and hard to acquire that the wines here have never been kept long enough before use.

There is probably no old wine in the State. Age does not eliminate the alcohol, but it mellows it; and if these wines were old, they would keep without any difficulty. They have an individuality of their own, which I think is a good thing. Why should not California wine be very different from all other wines?

It is a mistake here that we have been trying to produce something like their vineyards produce. We should have our own type.

We find that the greatest drawback to the sale of our wines is owing to American snobbery. We have a production of 2,500,000 gallons of wine every year, nine-tenths of which is drunk by foreigners. It is only the Americans who won't drink American

wine. The average production during the last eight years has been 6,000,000 gallons. Last year we shipped away 2,000,000 gallons of wine, and the year before that we shipped away 1,500,000 gallons. This wine is all made here, and large quantities have been distilled into brandy and vinegar, because (in 1876) the wine was so low in price and the production so great (there being more than 7,000,000 gallons made that year) that the vinegar factories made their vinegar out of wine. I know fine lots of wine that could have been purchased for less than 15 cents per gallon, and one lot went for 10 cents, although it cost from 12½ to 15 cents to produce it.

The average production in Sonoma Valley is about 350 gallons per acre. The average production in Los Angeles County is 200 gallons per acre. The average production in Napa County is between 400 and 500 gallons per acre.

There is a place in Napa County where 12 acres produced 17 tons of grapes, and there are places where the land produces 2½ tons per acre.

Our wine business has increased very greatly in the last five years, and as our wines are liked better, better prices are paid for them.

Q. What is the life of a vine?—A. The life of a vine has no limit. After 100 years there are vines still living and producing. After the slip is set out it takes about four years to produce the grapes.

The varieties of grapes we use are thus bought by the commission of which I spoke. There are said to be 480 varieties, but there are several that we rely upon.

The Zinfaudel grape is that from which we produce the claret wine. The best class of heavy wines, like Burgundy, are made from the Burgundy and the black Pienau and Genasche. The best white wines are still wines, like the Hock and Sauterne. They are made from Chasselas and the Riesling. They can make very good wine out of the raisin grape. Mission grapes make a very poor wine, because its component parts do not seem to be such as will answer for wine-making.

The foreign vines brought from Europe will not bear until from seven to eight years have passed, but ours bear at the end of four years. When foreign vines are brought here the skin becomes a little thicker and the berry gets very much larger, and the saccharine matter becomes very much more abundant, and the wine made from them has more alcohol in it; the acid of the grape diminishes.

The French say that the *Phylloxera* came from America, that our climate develops it on the plants. I do not believe that it did originate in America. Professor Riley says he has known it for forty years. We found *Phylloxera* about four years ago in Sonoma Valley, and it is confined to that valley. I have found it nowhere else. It takes about three years after its first appearance to destroy the vine and kill it. The first year it is on the vine its appearance is noticed by a little color and the edges turning up instead of down. There is also a little furze on the leaf itself. The next year, in the spring, you will find a very short growth in the canes from the buds. Another year the growth has stopped entirely, and there is hardly a sign of sap.

Q. There are about two millions of acres that have been withdrawn from settlement because they were mineral. Do you know anything about those lands?—A. Yes, sir; I know something of them. These lands would be more valuable for grapes than for mining, because we do not know how much mineral there is in them, and we do know they will produce grapes. I know vineyards in Europe that have been yielding for 1,200 years. We do not know of any mine that has been yielding for that time. I think the land would be used for small homes if it was thrown open to settlement. The small growers sell their grapes to the wine-makers. The grape yield produces over $3,000,000 worth of wine per year. It could be increased to $50,000,000.

The vines are becoming killed out in France, and the people here are fast becoming wine-makers.

The reason that wines are becoming adulterated is because of the demand for them, and there is not a sufficient supply to meet the demand. One man can manage alone and take care of about 15 acres of vineyard, and 15 acres of vines is about ten times more profitable than any cereal crop.

I think the only solution of the temperance question is to substitute wine for alcoholic drinks. If wine was drank instead of tea and coffee there would be no dyspepsia and no drunkenness. We find all over Spain, Portugal, Switzerland, France, Germany, and wherever there is much wine-drinking, there is very little drunkenness. I do not think the California wine, if steadily drank, would have any effect upon the noses of the drinkers. They would have to get their polish by some other method.

Q. How would you dispose of the land?—A. I would leave these lands to be settled up under the homestead and pre-emption method, just as the other lands are.

I think California can produce wine for all America when there 100,000,000 people. I know of no reason why our wines should not be as good as the wines of other countries, and the only reason why our wines are not is that they are not allowed to acquire age. Louis A. Rodier, who sells the best champagne we have, only sold the vintage of 1871 or 1872 last year. His firm has about $5,000,000 in their business. It takes some years to make old wine. You see there is the cost of the bottles, which is a large and important item. There is 50 per cent. saved in purchasing our wines. California wines

would be cheaper in the East if transportation was not so high. Then, too, we have no hard wood to make casks of. All the hard wood is in the mountains, and it is very difficult to get, so we find it cheaper to transport our casks from the East. The casks have been cheaper for the last few years.

I would leave these lands just as they are, giving them to everybody who chooses to come in and get them, for the wine industry is so assured from this time forward because our wines have such a reputation abroad. The only difficulty we have met with was right here at home. Doubtless there are thousands of people in France, whose vineyards are destroyed, who would take up these lands if they thought they could get them for $1.25 per acre. There might be some inducement given to emigration by allowing the emigrant to enter a quarter of a section if he planted out, say, 20 acres in vines, and then give it to him.

We need more water for irrigating wine after it is made than for irrigating the vines. That is a great drawback. The wine is cheaper than the water down in the San José district. I think that water should be under the right of eminent domain, and then be divided up and allowed to be used by all free. I do not see any reason why the land and water should not go together.

Testimony of A. T. Harriman, of San José, at San Francisco, Cal., relative to the present system of surveying and irrigation.

A. T. HARRIMAN, of San José, Cal., testified at San Francisco, October 10th, as follows:

I am deputy surveyor. I have had contracts under the United States for the last five or six years, and have them now. I think the present system of surveying is an excellent one, but I think it should be improved. I would make some changes. I think that our manual has become obsolete and old, and newer and more scientific methods should be allowed the surveyors, so that they could be able to make better surveys and make them quicker, in order to do away with this terrible array of complaints which seems to be made everywhere against the settlers—our own settlers as well as other people. If the work is properly done the present system is adequate to the public service. If the lines are run well and carefully and the corners are well set they will last. A few years ago I found posts that were set in 1850 and 1854; but they were of oak wood. If they had been pine they would have lasted only one or two years. I think there should be at the commencement of every fourth township a permanent monument, and if you can get them closer than that I think it will be better. I would improve the surveys as much as possible, and think the surveys could be improved now were it not for the niggardly policy of the government. The pay is entirely insufficient. I would have two different kinds of pay attached to the contract system. I would pay per mile in subdividing and townshiping, and I would then pay for the topography and exploration separately per section. I will illustrate the second idea. I have heard it very often stated that under the present system men will get hold of a whole range or township by simply acquiring some sub-division of forty or eighty acres of a section upon which a spring is located. That being the only water it of course controls the land. The surveyors at present do not care for those springs; they are not directed to look for them at the present time, and the rates being so low and the work being scattered as it is all through the country, the only thing the surveyor thinks about is to get it done, and it is a common thing for it to take eight or ten days to find the place where to begin, and then we have got to hunt four or five days for the corner. And often we are under a big expense in hiring extra help, &c., and when we find our corners there is often only one township instead of three or four to be surveyed; and we don't think anything about exploration, but only about getting done and not losing money.

A deputy surveyor should have better pay and have a better method of doing his work. I believe in more instrumental methods. I do not use a solar transit; we do not need a solar transit in our county; we determine the points by solar observations. The mountain transit is all the surveyors use. We run our lines as we go along, and instead of having one flagman I have three. One flagman is for the line, and the flags on the two sides are for the topography. A flagman goes over to a prominent point or junction of a creek, a prominent peak, a clump of timber, or a little bench on the mountains, and holds up his rod, and I know at once where the points all are. I measure the distance to this point and put it on the map instantly, and sketch in my topography as I go along, and thus give to the government a perfect plat of the whole township instead of a little index plat that shows little or nothing. That takes just four times as much time, and it would give three times as much data. I always take altitudes, but I have been informed that it was not necessary. I always carry a barometer in my pocket to determine the altitude. If any man hires me to make a survey of his ranch, of his timber, or anything else, it is none of his business how I

get my points. I am supposed to understand my profession, and the quicker and better I get them the better it is, and that should be the idea. The United States should leave it largely to the discretion of the deputy surveyor, with this additional caution, that an inspector should be appointed to personally inspect the work before it is paid for. If the deputy surveyors are men of sufficient capacity to take charge of the survey, we should not need inspectors. I do not think the matter should be left to the discretion of the Surveyor-General, for he has not time to look after these things.

I would improve the manual. It can be done in this way: A commission of four or five able, intelligent surveyors, men who understand their business thoroughly, should be selected; they should be selected from men having experience in the field; and in a very short time they could make up a manual and select much better methods of surveying. The Surveyor-General should then see that this manual is followed by the deputies.

The government allowance of variation in closing lines in plain open land is too much; in the hilly land it is not enough. No man can afford to measure by a chain and compass in such way as to close anywhere near the government allowance on account of the small amount paid now. If you all instrumentally work there is no necessity to increase the amount of allowance on the mountains and hills—if you put it on a higher scientific plane. It costs $1,000 sometimes to get one small claim of 160 acres of land surveyed. I charge $10 a day, and when I furnish men and teams I charge $20. If these surveys were properly done it would not cost so much, but there would be more or less of this to do no matter how the surveys were made. The corners are sometimes destroyed, but in some places the surveys have been most wretched. The surveys on the east side of the Santa Clara Valley are wretchedly done. I have yet to find a single line that measures a mile accurately, and have yet to find the first corner-stone. This valley is 20 miles long north and south, and 12 or 15 miles wide. I have known men whose work demonstrated that they were not fit to be employed as deputy surveyors. I have known this in several instances. I think where the survey of a country is to be a basis of a title the surveys should be made accurate and with a proper description of the land, and with the corners well set, so that at the end of fifteen or twenty years they can be readily resurveyed. I think, if it was properly done with the corrections I suggest, that any competent man could find out where the section or some subdivision of it was. The present system is ingrafted in the people; it is simple, and the people can very easily find out how to locate a section. I do not think there is any necessity for any additional notice. The settlers generally keep track of the matter, and know where their land is.

I am in favor of a national system of irrigation under State or United States auspices. I think the experience given to us by engineers ought to be crystallized and a system should be worked out by which the States or the United States becomes the source of all irrigation; but I am afraid that is somewhat like shutting the door after the horse is stolen. There is no system at present. I think if the contract system was entirely abolished, and if parties were sent out into the field and equipped by the United States, that the cost would be so terrible that it would be unbearable.

Testimony of W. T. Haywood, engaged in irrigating San Bernardino County, California.

Mr. W. T. HAYWOOD, engaged in irrigating business in San Bernardino County, California, testified as follows:

I have had some experience in the matter of irrigating lands for five or six years. In my judgment the public lands and waters should never be separated. In Spain, Italy, and all other countries except India, the waters and the land are not separated. In India all the canals are owned by an English company and the waters sold to the natives who lease the lands. This is an interesting question to every man in this State who has lands. The difficulty of securing water rights permanently depreciates the value of this kind of property to a very great extent. There are thousands of acres of lands, not only in San Bernardino County but in other parts of the State, that could be made available, and would be made so at once and be occupied, provided there was a certainty of getting a title to the land and water alike; for title to the land alone is of no value. Now the difference in valuation of land with water over that without, in the same neighborhood and having the same soil precisely, will be from fifteen to twenty dollars per acre. For instance: I have been president and superintendent of the Riverside Company, and we have spent $230,000 in furnishing water and irrigating about twelve thousand acres of land. Now this land was put upon the market with other large bodies of land as early as 1853 by proclamation of the President. It laid there unoccupied as government land until 1865, when in consequences of greenbacks being at a low figure it was bought up by men in California at $1.25 per acre from the

government. It laid there idle from 1853 to 1865, and then it was held from 1865 to 1874, when I purchased it. Now that land was apparently of no value, not worth ten cents per acre. Without water it could not have been beneficial in any way. Having put water upon it we have sixteen hundred people occupying that tract of land, who have four hundred thousand orange trees growing, and one hundred thousand fruit trees, and we have a very prosperous and thrifty class of people there. That is the result of one irrigation scheme. I do not believe extensive irrigation is possible without organization. There should be a government system of irrigation, and there must be some organization, or else you must leave the matter to work itself out. We understand that the law by which we have acquired our water rights from the State has been confirmed by Congress and that we are safe. Other people have different views and they are contesting the matter with us in the courts. All such actions have a tendency to depreciate that property, to prevent its sale and settlement.

And then there is another important point which has not been settled in any court in this State—what is termed "riparian rights." That question has been before the courts time and time again. It was brought up in Judge Neely's court a year ago last September in a suit instituted by a man named Talbot against parties in San Bernardino County, but he did not decide the question. The matter should in some form come up before the Supreme Court, and then Southern California will prosper and go ahead.

I am not in favor of pasturage homesteads. No benefit can be derived from them, because they cannot get water. I tell you there are not a hundred acres of land in the southern portion of California that can be used without water, and there are hundreds of thousands that can be *with water*, and it cannot be obtained unless by irrigating-wells. I would favor pasturage homesteads if there was any land that could be thus utilized.

As regards the condemnation of ditches and water rights to be used for public purposes, if such condemnation is made the parties who have invested their money should be indemnified. I would be satisfied for the government to come in and condemn all our ditches and then pay us for the money invested, and let them adopt a general system of irrigation. Either the national government or State should adopt such a system. We would be perfectly willing to pay for the waste land. Of land which could be reclaimed in California there are about 10,000,000 acres, which, if abundantly supplied with water, would never, in my opinion, require any manure. It is a patent fact that land irrigated with water taken from mountain streams and rivers will produce double the quantity that lands irrigated with artesian wells will. I have the facts to prove that proposition. It is the observation of all intelligent farmers that land thus irrigated will produce the most money and improves in quality. The difference in value of lands in Spain is calculated upon the basis of land irrigated and land not irrigated. You can buy land for $10 an acre equal in every respect with that costing $2,000, excepting that it is above the line of irrigation. It may be in the same field and identically the same soil.

In Valentia, Spain, you pay $25 an acre for the use of land for agricultural purposes, and you can buy adjacent land of equally good character at the same price and get a perfect title, but without water. We have in San Bernardino and Los Angeles Counties land which has been under cultivation for thirty years, and produces as good a crop now as it did at first, just by irrigation and without manure. It takes less water year after year after the soil is soaked. We sank wells in 1874 and 1875 to the depth of 45 or 60 feet and got fine water. The ground was as dry as powder from the surface to the bottom. Now wherever we have irrigated that land it is moist to within a few feet. It is a positive fact. There is another important thing in regard to irrigation. Where there is not an abundance of water always the land will be saturated a little at a time—and after a while it will require only a little surface water and no deep soaking. It will then only require annually sufficient water to cover it. A 3,000-inch stream (miner's inches) will cover 12,000 acres 3.73 inches deep. At that rate a 5-inch stream covers 20 acres to the same depth. It will do it as a fact. There may be some loss by solar evaporation. You can easily make a calculation of the actual amount of water required to irrigate a given tract of land and measure the streams. The amount of water that is available for irrigation could be measured by scientific gentlemen in the field, and they can make reports containing all the data needed to show how much land in any section can be irrigated. I have been all through Los Angeles and San Bernardino Counties with engineers who have made such estimates.

There is another matter that is very important to us and that seems a great hardship. We have added $1,000,000 to the tax-paying property of San Bernardino County by the investment of $250,000. Now then we are taxed for our canals. They tax the land which is under irrigation $15 to $20 an acre, while that not reclaimed is taxed on a basis of $1.25 per acre. It is all of the same quality and value without the water. Nowhere else on the face of the civilized world do they tax canals. In Spain they give every encouragement possible to private parties. Canals should be exempt from taxation. Our property is doubly taxed.

In regard to these large tracts of land and how they should be developed, I cannot conceive any way in the world in which they can be made available without a combination of capital. The result in San Joaquin, where men have combined and engaged to build canals, has been that there has not been a day since they commenced work that there has not been litigation. There has never been a question settled. They are all the time quarreling.

I have been over vast tracts of territory examining it, with a view to irrigating it and taking it up as desert land. If there was a certainty about this law, I know of several large tracts of land which can be put under irrigation immediately, and could inaugurate a system of irrigation that would suit all the parties interested—which is a very strange thing. There are several agricultural centers where there is not a family who does not want to enter into a combination with some large irrigating system. It costs them too much money and labor to do it for themselves. They will sell all their rights at once and take their pay in water. Would not this be a benefit to everybody that wanted 10 or 50 acres of land to have that land put on the market at a price they can afford to pay? If you put water on 5,000 acres, into 160-acre tracts, they will sell it right off to the first man who comes along. The present law and system are not applicable to the present condition of the lands. Either allow the irrigation to be done by the companies, or allow the State governments to do it, or inaugurate a national system. If the government had kept the control of the water it would have been a good thing. Now they cannot get it without reimbursing the parties, because having encouraged parties to take up land and put water upon it, the government cannot now equitably confiscate their property.

There is another question which will come before the next legislature here, which is whether there shall be one water system and one price. In my opinion that can never be done. The price must have direct relation to the cost of obtaining it. In some places you could obtain the same quantity of water we have in some places for $20,000, and it would not be right for those parties to receive the same compensation we do, who have so much larger capital involved. As I before said, we would be perfectly willing for the government to appraise our water property and pay us for it.

There are certain difficulties in disposing of the timber lands. The law operates in this way: For instance you sell a hundred acres of land at $2.50 per acre. Suppose the timber on that land will cut 100,000 feet to the acre. I know some that will cut 300,000 feet of lumber. One-quarter part of that may be fine, choice lumber, which would be very valuable to lumbermen. A will come to some such man and say, "I have found a fine batch of timber." The lumberman sends his expert to examine it. He finds, perhaps, 100,000 feet of timber, of which much will be worth $15 per thousand while the balance will be worth $8. He sends his teams down and buys it, or the man making the location supplies it himself. That gives the same man an opportunity to select other similar tracts. Now what is the use of 160 acres to a saw-mill man? He cannot do any business on such a basis. Nobody is to-day making a profit of a dollar a thousand on lumber in the foot-hills. I would put the jurisdiction of the timber lands in the register and receiver. When lumbering is done in a forest it leaves the ground encumbered with brush, and fires break out and the whole country is destroyed; but where the forests have not been disturbed and are dense the fires will not run to any considerable extent. As long as the government owns forests they should be protected by foresters, or persons specially designated to care for them. A long time ago, through the columns of the old National Intelligencer, the government advertised the country around Puget Sound as being magnificent timber country, and invited people to go into it. I was among the first to do so, and put up a saw-mill, and then made application to the government for permit to buy timber. I wanted to buy 5,000 or 10,000 acres, either by paying stumpage or in some other manner. This was in the spring of 1863. I was informed then that I must confine myself to 160 acres. It is very difficult, generally impossible, to get a good mill location and good timber together. You have got to put your mill wherever you can get good water, and afterward hunt up the timber and get it where you can. The next year I went to Washington and put this matter before the department and wanted the right to cut timber, but got no encouragement. I spent $50,000 in that business, and yet there was no way in which I could get the timber to work my mill with, and I was informed that surveys would be ordered to go on, but that if I trespassed upon the timber I would be liable to imprisonment and fine.

About 1856 the government sent out circulars addressed to all the mill and business men on Puget Sound and in Washington Territory inquiring where they had erected their first saw-mill, how much timber they had made the first year, how much the second, how much they expected to make the next, and so on. A copy of this circular came to me. I did not fill it up, but other parties did. Some parties who had made 4,000,000 feet put down their product at 12,000,000 feet. The next year a district attorney came out with those very documents and prosecuted every man cutting timber on government land. When you want to prosecute a man in Washington Territory or Oregon you have to go before a grand jury and get him indicted, and you

charge him with cutting timber on section 3, range 4 south, &c., as the case may be. The case drags along for awhile, and you get as witnesses the men who cut the timber, and they are asked, "What do you know about Mr. L. cutting timber on government land?" and the other side will contend and the judge will rule that you must confine the evidence to the particular section cut over and which is specified in the indictment. You must confine the prosecution to the indictment section 3, range 4 south, and the witness will most always be unable to tell what section of land the timber was cut from, and your case will fail. That is generally the history of timber prosecutions. In order to prosecute successfully you have got to have surveys made. The present system of timber protection works badly.

Testimony of Patrick J. Healy, of San Francisco, Cal.

SAN FRANCISCO, *October* 16, 1879.

PATRICK J. HEALY, secretary of the California Land Reformers' League, testified as follows:

This is an institution or society that exists for the purpose of getting a better system of tenure of public land for settlers. It has a central organization here in the city, and has correspondents throughout the State. There is no other organized society at present.

I have been a miner and I say (and believe I represent the organization of which I am speaking) that the public lands in the United Sates should not be sold to any person, and that no person has the right to sell, bequeath, or in any way encumber the land by selling it, so as to give anybody a moneyed right in landed property. The fact of use should be the only title to the land. We simply mean that we wish to have a tenure of land in this country, and I would suggest for myself that the land where it exists in townships should be so surveyed that communities and colonists could have better facilities to settle upon it. For instance, a man now is supposed to live and settle upon a claim he pre-empts. I would like, and I think it would be to the interest of settlers, especially in the northern portions of this country, in Washington Territory and Oregon, for settlers to be allowed to pre-empt one quarter section and live upon another, and not lose their right to pre-emption by so doing. This right should be extended to all those who wish to avail themselves of it; that is a community system under the present law of the United States. That, I believe, would be something that does not exist under the present land laws.

Question. Is the present acreage enough?—Answer. I think in some cases the acreage is entirely too much, and in other cases not enough. One hundred and sixty acres of land in some of our southern counties would not be much for a pasturage ranche. I would not give a pasturage homestead. I would reduce the pasturage ranche as it existed in old times, and I would not survey it at all.

Q. What have you to say about irrigation?—A. The question of irrigation is a question of great importance, and should be discussed by the national government. I believe the general government ought to undertake all this irrigation and that private individuals, so far as they have gone on improving the land by irrigation, should be recompensed by the government, and that it all should be controlled by the government. No individual has the right to control the natural resources of the country to the extent that the government has; hence it follows that the government should hereafter control irrigation. I believe that the land now called arid and the desert land by a wise system of irrigation would be all producing land in the future, equaling our foothills. There is no reason why the cañons could not be made available as natural reservoirs, such as they have in India and have had for hundreds of years. They could store the water there for future use. This system suggests itself to every one, but private ownership can't carry it out. I would not allow any man to own land so that he can mortgage it and sell it. The use of the land should be the only title to it. He might sell the improvements, but the lands themselves he never should. He ought not, by right, be allowed to sell it; then if he can't sell it, of course he would not want any more than was necessary for his own use, and the question of land monopoly would then cease. This would not stop settlement of the land, but would extend it. People would then be compelled to incorporate, and rely more upon each other's honor than upon any bounden duty.

Q. How would you acquire the right to use the land?—A. File his right with the government—go on the land as they do now, and let the government say, after you have been there a sufficient length of time you can have the land. Occupation is, after all, the right to the land. How has this city been acquired except by that very right? Let the government hold the land for the people. I would draw a distinction between those lands that have been already granted, if you wish to preserve the vested

right, and after the death of the holders it should revert to the government. I am not in favor of any law which would take away that which any person has honestly acquired, without recompensing him, nor does the body which I represent have any such communistic ideas. We are not communists, but American citizens who wish the preservation of American institutions.

Q. What would you do in the case of land the occupant of which has died after having placed valuable improvements upon the land? How would the government dispose of the improvements?—A. Sell his improvements for the benefit of his heirs, just as you would any other property.

Q. To whom should the occupancy or use of the land be accorded?—A. To his heirs.

Q. Then the government should sell the right to use the land?—A. That would be its only method of raising taxes for its support We think this plan is feasible. We see that there is agitation all over the world. It is not confined to England or Ireland, and in this country it will be a great problem. As soon as the land is all gone here, the land question will become an important one. This commission is probably the first of a great many commissions which will have to deliberate upon this question. Any man who has lived here knows the liability of persons to get shot for trying to get the use of an old piece of land, if it is not agreeable to the surrounding settlers for him to have it. That would cease if the government held the land in trust for the people.

Q. What is the difference between your process and the other processes for disposing of the land?—A. In our process the government could not give the right to use the land to any persons who did not use it, the land would not go to persons who would not use it. The difference between that and the present system is this: that the government allows the land to go to persons who hold it idle for centuries, while the people around are starving. Parties obtain possession of land and leave it vacant, and by a law it remains vacant. Under our proposed system this cannot exist. No person could hold land vacant for speculative purposes.

Q. How extensive is that holding of land without occupation?—A. I would say that the major part of it is held under such tenure—held vacant for speculative purposes, without any improvement whatever. Sometimes they run up a fence, but as a rule they do not. If the fence is put up it is usually made to serve as a notice to keep off the property, and they have men hired to keep people from settling on their lands. That system exists all over Nevada and all over the southern portion of this State. It is not so extensive in Washington Territory or Nevada as it is here.

Testimony of A. T. Herrmann, surveyor and civil engineer, San José, Cal., relative to rectangular surveys and cost of surveying.

To the honorable Public Land Commission, Washington, D. C.:

GENTLEMEN: In reply to some of the questions of your circular, issued under the act of Congress approved March 3, 1879, I beg leave to offer the following reply:

My name is A. T. Herrmann; I have lived in California since 1861, and have been a resident surveyor and civil engineer in the city of San José, Santa Clara County, California, since 1866, having practiced my profession principally in the counties of Santa Clara, Santa Cruz, San Mateo, Alameda, Merced, San Benito, and Monterey.

Have never sought to acquire title to public land for myself, but have necessarily seen a good deal of the working of the public land laws incident to my professional duties.

Deeming, however, the questions regarding the system of public surveys and their execution of infinitely greater importance to the professional surveyor than the working of the land laws, I would in my answers or suggestions rather confine myself to matters bearing directly upon the "survey," and leave matters of law to persons having made that part a specialty.

I have no hesitancy in saying that I consider the rectangular system of surveying as the very best one which can possibly be devised. It is easily understood by the professional man as well as the layman. Its methods of nomenclature and location, naming by townships and ranges even long in advance of the subdivision in every part of the country in a manner at once precise, short, and unmistakable, is perfect and simplicity itself.

Its correction of foreseen and unforeseen errors, following closely the lines and methods of the geographical division of the globe, are so well planned that, even if but indifferently executed, they make large mistakes impossible, transferring themselves from point to point and from old districts into new ones.

Its excellent subdivision into sections and the different parts of a section down to the smallest mining claim, taking as a base the measure of length everywhere used and known to every child, is at once so clear, so simple, and so easily understood by

anybody having mathematical knowledge enough to conceive of a square, that it would be impossible to discover anything more to the point or better adapted to the wants of the people. The most uneducated backwoodsman, knowing simply the points of the compass by the sun, and with arithmetical knowledge stopping perhaps at the figure 4 or the number of the fingers on his hands, will readily learn and find any given subdivision of a section, without even so much of a chance of a mistake, while I have found it an everyday occurrence that settlers, having the experience gained by watching the survey of one township, even without the slightest knowledge of the art of surveying, would, some of the section corners being established, invariably locate prominent objects or pieces of choice land in the smallest legal subdivision, without making a fatal error as to general location of the correct subdivision lines. And, being so easily understood, the system has become really a part of the penates of the American settler. He knows it by heart, he swears by it, he instills it into the minds of his children, to whom perchance the school-teacher gives a few more valuable hints furthering a more thorough understanding than the rough and unhewn conception of the old man ever dreamed of, until it has become so permeated with the average American having any dealings with land matters, that to uproot it out of the minds of the people would, in my opinion, be really a far harder task than devising a new and better one.

Its facilities for re-establishing lost corners and the percentage of chances of getting them, as near as may be, into the original positions is greater than in any other sytem of surveying, as it will take fewer and straighter lines to prove the missing point.

Its definitions for the purposes of chains of title in property is so far ahead of anything else in that line in the world that a comparison is hardly possible. Compare, if you please, the abstract of title of a subdivision of a Spanish grant with that of a legal subdivision of a piece of public land. In the one case it will take at least one very good lawyer, one or two good surveyors (often a dozen or more), and endless explanations, resurveys, and descriptions over pages and pages to properly locate and define the object and, so to say, to pin it down beyond a doubt, while in the other case, the proper legal subdivision once being given in the patent, no other elucidation, research, or survey is necessary, but a simple reference to the official plat, the authenticity of which is beyond a doubt, proves the entire question at a glance and saves the people lots of money, which otherwise would find its way into the pockets of lawyers, surveyors, searchers, or agents.

Wherever you test the system on its merits you will find it true to the core as long as its execution has been administered by competent, trustworthy, and honest hands, answering to perfection all the purposes it was devised and created for; and whenever, according to popular complaint or official inquiry, it has been found wanting the cause may safely be put down to the abuse of its rules and maladministration, as well in its spirit as in its detail; and right here is where an improvement is urgently called for. Just as little as you would think of letting the sailor run the instruments of the Coast Survey or making the common soldier the commander of a regiment at the eve of battle, just as little you ought to think of deputizing any but the most competent and properly trained professional men to make the surveys of the public lands.

"Oh," it is said, "there are only straight lines to be run, and anybody can do that," when really just that is the most difficult problem of all, the solving of which has made the best heads of the world ache and quail.

But is it really only the running of a few straight lines? If so, I misunderstand the spirit of the manual entirely. To my mind the deputy surveyor is the means by which the government gets acquainted, and thoroughly acquainted, with its vast domain. He is sent there, not only to set a few corners and blaze a few lines, but he is appointed a committee of one to thoroughly explore the new country, getting not only such information as may happen to lay openly along the side of his line, but make it a point to see everything worth seeing, everything which may be of any value to either the government selling the land or the settler in search of a homestead.

But how, in practice, is the execution of this idea?—I am professionally almost ashamed to refer to the books and books of field-notes on file containing from one end to the other barely anything but "40.00 chs. ¼ sec. cor., 80.00 chs. cor. to sec. —; land third rate," and five lines of general remarks at the end, and a township sketch, if one at all be added, more like the scrawling of a schoolboy than like the result of the intelligent survey of the professional surveyor.

But, leaving the discussion of individually bad work for another place, is really the deputy to blame for such bad results, and should not the blame rest with somebody else? The deputy, and especially the young deputy, may start out on his first contract with the very best of intentions. He has carefully studied the manual and goes to work with a will, but he soon finds out that he is put into a very awkward position. He organizes his camp, he buys or hires his animals and wagon, he pays in full or in part for his provisions, and he starts out. Let us follow him:

He reaches the nearest place of his work after traveling from say five to ten days,

and, after he has been obliged to leave his wagon at the end of the road and resort to packing over trails that must be seen and tried to be appreciated, and getting somewhere near his point of beginning, he hunts and hunts in vain for a corner. He loses a day, and another one, and perhaps a half a dozen more, and finally may even be obliged to pack back and retrace lines miles off so as to get a safe and well-authenticated place to commence from.

At last he is certain to be right; he starts in for good, and just by accident he remembers the day of his starting from home, and, lo, he sees that he has been out two full weeks already; that he has, as it were, paid already wages to two chainmen, one flagman, one marker and axman, and one cook, aggregating about $7.50 per day, for twelve days; that he has not earned one single dollar so far, and that the country is so rough that, at the slim mileage allowed by an economical government, he has a still slimmer chance to work ahead of the daily growing debt. Is the deputy, after mentally considering all these little items, in a fit mood to play the *rôle* of the faithful explorer and expounder of the manual? Will he look to the right and left? Will he leave his instrument and crawl through yonder deep cañon to examine the very curious formation on yonder cliff, looking as if it might be a vein of some metal-bearing rock anxious to be developed, and add thousands to the wealth of the people? Or will he try to penetrate yon thicket, looking so fresh and green as compared with the dried-up aspect of the barren mountain peaks, to ascertain on what legal subdivision the clear spring of water is located, the possession of which will virtually be the possession of the entire mountain range? Or will he not rather be inclined to curse and swear when, after a day's work in the broiling sun—work as hard as any ever invented by man—he sees that he cannot possibly make more than one and one-half or, at best, two miles a day, and not even that if he strictly follows the rules of the manual, and it is quite a thankless job to retrace and search for days and, finally, perhaps find the error miles off, and be allowed one or two miles for retracing somebody else's mistakes, consuming twice and treble the time of new work.

But he may not find the error; what then? Is it probable that the error will be found out at once, or is the government supervision such that there is no danger of immediate discovery? I think the less said the better about the examinations now in vogue, where the law restricts the government to such a small compensation that no efficient professional man can be found to do the work.

To return, however, to our subject; our deputy has finished his township and he proceeds to the next one, some thirty or fifty miles off. He sees at once that he has to change his *modus operandi;* that he has to lop off all extras, first of all being necessarily all explorations outside of the immediate vicinity of his line; and that his sole aim and cry must be, "Ahead! ahead! hurry up! we *must* make so much, so as at least cover expenses." But as he proceeds he finds, first, that only about one-third of his township is surveyable—the balance being dense chaparral, practically impenetrable to the claim unless a trail at an additional expense of $12 to $20 per mile be cut—and, next, that his closing is not within limits. There are two dilemmas: First, he finds only one-third of the expected work to do which he has gone to a large outlay, based upon the best obtainable information; and, second, there is an error somewhere either in his work or somebody else's work, such a thing as a lot of contiguous townships being, generally speaking, a thing of the past, and there the same thing repeats itself, with perhaps this addition by way of change, that one of his horses dies, that his wagon breaks down, or a pack rolls over the precipice, taking a mule along with it, or that one of the men gets disabled, and another green hand has to be hired at high wages, and, in order to be in strict accordance with the rules, has to be sent on horseback some fifty or sixty miles to the nearest justice of the peace to be sworn in; or, perchance, as I happen to know by bitter experience, his instrument is upset and smashed up, and he has not been able for some reason or other to have an extra transit along. All these things can happen, and they do actually happen a great deal oftener than the department is aware of, playing quite an important item in the possibility of a margin on a contract.

However, our deputy worries through his contract and returns. First, of course, he has to pay his men; there is no credit in that line, even if he can find a grocer who for the consideration of high prices and bad provisions will trust him; and then the notes have to be made out. That, especially for mountainous country, takes more time than generally assumed, and when finally everything is ready and he casts up his accounts, he finds that if the department allows him for the miles he thinks he is entitled to, he covers expenses and makes from $3 to $4 per day, and in lucky cases even $5. But now begins the waiting. He files his notes, but there are piles of them ahead of his notes. Why? Because an economical government cannot afford to pay draughtsmen enough to keep up with the demands of the service, and so the days wear on until it may be ten months or a year from the time Mr. Deputy started out to the day when he finally receives his warrant, the amount of which often falls short considerably of what he knows is due him. And does it do him any good if in such a case he appeals? Let those who have tried it answer that question.

Is it a wonder, under these circumstances, if the deputy steps down from the high plane of professional pride and integrity and simply looks to the financial side of the question and governs himself accordingly? I think not; but I do think that the remedy lays in the hands of the government, and there alone.

Begin at the root, and appoint permanent deputies solely with a view to their professional standing and to their character. Have it understood that, once a deputy, the position is one of honor and trust, which once abused brings dismissal and disgrace forever, but that otherwise the position is an assured one, no matter who be elected President or what the politics of the deputy may be. Let it be understood that the appointments will be made with a view to possibly employ the permanent deputies all the year around, so that they may find it to their interest to devote their entire time to their office; that they will be paid in such a way that they can afford to do good work and be honest, allowing them such a mileage that possibilities which must necessarily be taken into consideration by every prudent contractor need not be dreaded as swallowing up every little margin without a chance of recuperation; and that they will have a superior officer, one a thorough surveyor and engineer, whose sole business it will be to personally examine and supervise their work, and who will attend to his duty without fear or favor.

Let the office work be conducted in such a way that the least possible time may elapse from the date of filing the notes up to the payment for the work; or, better yet, make a rule by which, after a preliminary examination of the notes by the draughtsman department, and the supervising officer's certificate as to the performance of the field work, a certain percentage may be paid the deputy, so as to take him out of the hands of the sharks who are anxious to advance him money at ruinous rates, and enable him to square up his bill of expenses.

The appointment of a thorough, practical surveyor as inspector or examiner I deem one of the most important and beneficial improvements. He should be a man well acquainted with the State, should hold his office during good behavior, and be paid enough to do his work well. He should examine *all* surveys without exception, so as to be able to keep the office thoroughly posted as to where surveys are needed and ought to be pushed ahead.

As to the surveys themselves, I would suggest that the manual be remodeled with a view to keep step with the general advances the profession has made since the beginning of the systematical public surveys. The plains and valleys, generally speaking, have been subdivided long ago, and what is left is partly hill land, mostly mountains, and to a great extent the very roughest mountains of the State. It is well enough to confine the deputy to compass and chain as long as he has only to carve away on the wide and open plains, where nothing is met to prevent exact and good chaining and good closing a long way within the legal limits. But when it comes to rugged mountains, covered partly with timber and partly with brush, cliff following chasm and precipice deep cañons in quick succession, one peak overlooking the other, the line being one continuous obstruction from the south line to the north line of the township, and when then it becomes desirable to get a pretty correct topographical sketch of the country, then I think it would be very advantageous to tell the deputy to use every advantage science offers him, to show in the very use of his instruments that he understands his profession, and that as long as he gets his corners into the right place and well set, gets his line well marked and his topography in good shape, the department will be satisfied and say, "Well done, faithful servant."

If one man, with a good tachymeter and two or three rods, or even with a good light mountain transit and the proper and careful use of stadia rods, can give better results and do quicker and better work than another man who, with compass and chain and strictly in accordance with the rules of the manual, worries ahead and tries to do impossibilities, I should think that it would be to the general advantage if the newer method of the first man be adopted.

Why is it that the great surveys of other nations and our own coast survey invariably employ stadia measurements, getting results much more exact than obtainable with the chain? Anybody who ever has tested the comparative merit of common chaining and of stadia measurement in rough country will, without hesitation, testify to the fact that the comparison is about the same as between an open compass and a transit, and that the rougher the country the greater the difference in favor of stadia.

To measure a mile in, say, the roughest parts of our coast range, and get it within legal limits (keeping, of course, within the time a surveyor at the highest present rates can afford to spend on that distance), is simply impossible; while with stadia measurement, properly and carefully done, it becomes a question of a difference of a few links only.

How is the best topographical work the world knows of done? Surely not with compass and chain! A glance at the newest tachymeters and the result of work done with them on the railroad lines of the Old World, at the accuracy of the canton maps of Switzerland, of the military maps of Germany, and of the ordinance survey of

England will soon answer that question and dispel any doubt as to the value of instrumental measurements.

Would not the very use of this method, adapted to the peculiar and intensely practical wants of our country, be the best solution of the desire expressed in certain quarters to change the present system altogether and give it into the hands of the Geological or Coast Survey, or other scientific survey, and produce, with but slight additional cost, exactly the thing clamored for, and giving all the information which possibly can be wanted in the next one hundred years about those of our public lands which up to-day are unsurveyed?

Agreeing that this desire for better surveys is justified, that the Land Office should be able to afford settlers better and more detailed information than that had at present, that for military and industrial purposes the township plats ought to give a better guide than they do at present, would it not be better to improve by new methods of measurement on the old system at a small additional cost than to turn the entire question over to some scientific body, gauging the cost by the experience of our coast survey? How many townships would it take, surveyed by extending first the triangles of the coast survey and then plane-tabling the detail in the same way as the coast line, to bankrupt the nation? And would that be of any practical value to the settler, the bone and sinew of our country, unless it was simply a collateral to lines defining areas and boundaries of homesteads which necessarily had to be established separately?

It may be perfectly right for European nations, and especially for France, Germany, and Italy, to go to an enormous expense and prepare the most accurate topographical maps of their country that can be produced by human skill. The results so obtained, no matter at what cost, are to them worth every penny paid for them; but it does by no means follow that the same argument applies to the United States, and, more strictly speaking, to the as yet unsurveyed portions of the public lands. We are a nation of peace; they are nations of war. We do not exhaust the treasures and the labor of generations to prepare for war, but they do. We as a nation are more interested in the question whether the next batch of prospective settlers can find homes and live on them in the enjoyment of our liberties and in peace, building up villages and towns; they want to know which hill is high enough to rake, if crowned by cannons, all the surrounding country and destroy towns and villages at the command of a military chieftain. We hope that never a battle may be fought over our valleys, nor our mountain passes be climbed by armies eager for conquest; they know that their broad fields have been the chosen battle-ground for the nations of the world for thousands of years; that nearly every great commotion between the nations of the Old World has been decided by the sword on practically the same fields; that the battle-grounds of the nations repeat themselves, have done so and will do so, and must be studied for the sake of self-preservation; that on the proper and most intimate knowledge of their country may depend the fate of the nation; that every other consideration has to give way at this point, that they must know at all hazards, at whatever cost. And they do know their country well. Their maps are models; but do they as much as even care for a property line; do they even pretend to show them except for military purposes? Not even the fine maps of free republican Switzerland take the trouble to inform the citizens where and what they own, although every contour line is carefully given, to the highest glaciers and ice-crowned peaks.

If the idea of such a survey had prevailed when the now settled and densely populated portions of our country were "open to entry," there might have been some sense in it, to combine the detailed topographical survey with the right-angled system; but to commence at this late day, when none but the roughest lands are left unsurveyed, looks rather like shutting the barn-door after the horse is stolen.

I do believe that it would be worth while for the department to make a thorough trial in subdividing by instrumental measurement, combined with a rough topographical survey. Have it done by competent hands and give them all the liberty they want, with instructions to give the fullest returns as to classification, topography, water, minerals, and springs, and any other important object which, like a spring in a dry country, could be covered with the very smallest subdivision for the purpose of preventing the sale of all the surrounding lands. Let the deputy sketch his topography in such a way that with his notes he can prepare an index plat on a scale of at least 40 chains to an inch, which *shall be well drawn* and give all main topographical points by actual measurement, made as the deputy may choose either by chain or by stadia or by triangulation. Let him carry his aneroid constantly with him, so that he can give altitudes of all main points, mountain passes, and cultivable lands; and above all things pay him a sufficient amount per mile and a sufficient amount per section for exploring and topographical measurements, that he may not be obliged to make the one question, "Can I come out without losing money," be uppermost in his mind to such an extent as to make him derelict of his duties.

I have no doubt the surveys so made, properly supervised by a permanent inspector, will soon find favor with the public and with the department, and I can assure the

honorable Commission that the work can be done, and can be well done, by educated professional men, without doing injustice to the spirit of the manual. And I am further certain that the additional amount of money so spent upon each township would not alone be well invested, but would effectually stop all growling and trouble about bad surveys, badly or not at all set corners, imaginary topography, and all the endless array of other complaints at present made against the field-work of the Surveyor-General's Office. It would classify the land in a detailed and intelligent manner, describing it at length in the general notes, thereby giving the Land Office all facilities needed to deal understandingly with the people and discriminate between the *bona-fide* settler and the land-shark, and it would offer sufficient topography for all practical purposes that might arise for the next fifty years, and offer the general compiler all he can possibly claim for the purpose of mapping the State.

I am afraid that I have dwelt at greater length on the subject of the "survey" than agreeable to the honorable Commission, and although most willing to say what little I may know in regard to the other questions, I feel it my duty to refrain from making this communication lengthier than it is already. I shall be most happy, however, to elucidate by verbal testimony any points upon which the Commission may want to be further informed, or to practically demonstrate or help in any trials which may be undertaken.

Respectfully,

A. T. HERRMANN,
Surveyor and Civil Engineer.

SAN JOSÉ, *October* 8, 1879.

When giving some testimony before the honorable Commission in San Francisco I was requested to add to my written answer my estimate in dollars and cents for pay per mile of such work as I had described. I think it ought to be:

Line survey per mile: In plain, $8; in rolling country, $10; in mountains with scattered timber, $15; in mountains with dense timber, $20.

And for topographical surveys and exploration per section: In plain, $5; in rolling country, $10; in mountains with scattered timber, $20; in mountains with dense timber, $30.

A percentage of 25 to 30 per cent. to be added for township and standard lines respectively, and from 10 to 15 per cent. for subdivisions, if the surveys be pushed to the highest parts of the Sierra or kindred mountain ranges.

A. T. HERRMANN.

SAN JOSÉ, *October* 14, 1879.

Testimony of Harry C. Hill, San Francisco, Cal., relative to mining laws.

SALT LAKE CITY, UTAH,
September 19, 1879.

SIR: At your request I beg leave herewith to submit to your Commission my views upon some of the points or questions propounded in your circular under the head of

LODE CLAIMS.

At the close of the war I was sent by a New York company to Chihuahua, in old Mexico, as financial agent of a mining company. Shortly after my arrival at the mines I was promoted to the superintendency. Since that time I have been actively engaged in mining, either as superintendent in charge of property or as mining expert, to examine and report upon mines. I am tolerably familiar with mines and mining in Dakota, Colorado, Utah, Nevada, California, and in old Mexico, and in mines of gold, silver, quicksilver, and coal.

To point out existing defects in the laws is a much easier task than to suggest practical remedies for such defects.

I believe "all mining district laws, customs, and records could advantageously be abolished as to future locations, and the initiation of record title should be placed exclusively with the United States land officers." It seems absurd to allow a few men, always interested and often incompetent, to make laws for a district that virtually set aside the laws of Congress; and in very many cases these district laws have proved the greatest drawbacks to mining enterprise. I may cite the case of Montgomery district, Park County, Colorado, where, in a limestone country with "bedded veins," the width of a claim was made twenty-five feet on each side of the discovery. On Mount Bross, in this district, mining at 14,000 feet above sea level was an expensive experiment, and no one was willing to risk capital on 50 feet of ground with such surroundings. The result was, that prospectors and locators were forced to sell their narrow

claims at low figures to capitalists, who were equally forced to purchase an indefinite number of such strips before they were justified in going to the expense of making roads, and erecting buildings necessary for the shelter of the men working at that altitude. So that in this one case of so many that could be cited the district law proved the worst possible law for both parties that could have been devised.

I believe the present size of what miners call a "Congress claim," 600 feet by 1,500 feet, cannot well be improved upon. If a ledge is found to be wider than the 600 feet, allow other locators to have an opportunity upon it; 600 feet in width of ore ought to satisfy the most avaricious.

The present system of record is very defective. Mining titles are disturbed and expensive litigation is continually occurring through the fraudulent manipulation of these records. District recorders are not always either competent or honest, and sometimes lack both of these qualifications. District records are many times found the most useful engines for the destruction of titles. So many districts are organized and records made that are in a short time forgotten that district recorders are careless about the preservation of the first records, and when these records come to have value it is often found impossible to cure the carelessness with which these records were made and handled. In Deadwood, Dak., the first recorder appears to have been an old hunter who was too lazy to prospect, and was the only man in the district who *would* take any trouble about recording the few claims that were first discovered.

With the history of the Leadville records the Commission is probably familiar. They were passed from one man to another without authority, sometimes lost entirely, and at length a saloon was set on fire for the express purpose of destroying them.

The public land office is the proper place for records of public land, whether agricultural or mineral, and the United States officers are the proper persons to make the records, and these same officers should have the power to adjust all controversies concerning mineral lands prior to the issue of patent. Some means should be provided for the appointment of deputy registers, at least in mineral districts at an inconvenient distance from the United States land offices.

I believe that the surveyor-general should be required to survey and map mineral districts as soon as possible after their organization, and all locations should be distinctly marked upon the map, a copy of which should be kept in the local office, and the register or his deputy should be required to refuse to record locations that interfered with locations already made. The present official practice of filing surveys of lode claims which overlap on the surface should be changed, and surface-ground properly recorded and designated should not, until forfeited for non-compliance with the law, be subject to other location or record. I believe every possible protection and encouragement should be given to the original locator, but this same locator should be made conform to the laws enacted for his protection by the Congress of the United States, and should not be allowed to make laws to suit his own ideas of the case, and this renders the amendment of existing United States laws an absolute necessity.

I would clothe the recording officer with discretionary power sufficient to prevent locations that bore evidence of fraud. He should refuse locations unless the locators so fully described their claim as to make it possible to describe it upon the map already referred to. He should insist upon ore or mineral "in place" upon the claim being so described by posts or monuments that other locators could have no reasonable excuse for overlapping his location or interfering with it. He (the locator) should be required to do a reasonable amount of work upon the claim, and within a reasonable amount of time should be required to pay the government price of $5 per acre, and upon such payment a patent should issue. No more expense should be inflicted upon the mineral locator than upon the man who takes up agricultural land, save in the first cost of the land, and patents should issue in the order of application, providing the law had been complied with, and not, as is now the case, with such marked favoritism as to lead one to doubt the integrity of the officials in charge of this department.

In the American Fork district in this Territory a patent was applied for upon the Silver Dipper lode. No protest was made. The law appears to have been complied with in the letter as well as in the spirit. No objection of any kind was made to the application, and three years elapsed before the patent was received.

In the West Mountain district of this same Territory a patent was asked upon the Stewart mine. After the papers had gone to Washington and had been returned on account of some irregularity, an alleged fraud in the transfer of title from the original locators was discovered, and affidavits were sent to the Land Office in Washington [illegible]ing that the patent be withheld pending an investigation.

[illegible] investigation appears to have been made, and a patent was issued within a few days after the arrival of one of the parties in interest at the national capital, leaving one to believe that the mining laws need amendment in the administration as well as the text.

I believe that mines or mining claims should be confined by vertical lines. I am aware that this idea will meet with great opposition from various quarters, and will in some cases work hardship to locators; but once a record is properly made litigation

will practically cease, and the opportunity for fraudulent manipulation of mining titles will no longer exist in great measure.

There are so many different kinds of mineral deposits that it is practically impossible to frame a general law that will not work some hardship to some few cases. A classification of veins or deposits, and a law or laws to fit such classification, has been suggested and freely discussed by mining men. I do not believe the plan a practicable one; the laws will necessarily be cumbersome and difficult of interpretation, and the opportunities for fraud in the classification very many.

By allowing the locator to lay the six hundred feet as he thinks best, not as now compelling equal distance on either side of the discovery, in most cases—I believe in 87 per cent. of locations—sufficient ground will be covered to either make the locator rich or hopelessly bankrupt him if he persists in working.

In the Brodie district of California the veins are small ones, inclosed within hard walls, and very irregular in both strike and pitch; yet in no case that I can remember—and I am familiar with most of the mines in the district—would the irregularity of the vein have taken it out of the side lines in a length of 1,500 feet along the strike.

Again, I do not think the side lines should of necessity be right lines; allow them to curve or follow the irregularity of the strike. The fact that the lines, both side and end, when once described, are to definitely bound the claim, both on the surface and in going down, will make locators more careful in making their locations, something that at this time under the existing laws they are particularly careless about.

At present the constant fear of every miner and investor in mines is that at some time he will be "traced out." He never feels secure; and to the dishonest manipulator nothing affords so many chances for profitable fraud as this same scheme of "tracing out" a valuable claim. I know of many purchases of valueless claims having been made for no other reason than they offer a chance to "trace out" some other claim.

Leadville, Col., Deadwood, Dak., many places in Utah, Nevada, and California, are now cursed and progress impeded by expensive litigation that would all have been impossible had the claims been located with vertical side lines.

Expensive litigation is not the worst feature in the cases, although for examples of the cost of maintaining title I may point to the suits between the Raymond and Ely and the Meadow Valley, in Pioche, and those between the Eureka Consolidated and Richmond, in Eureka, as fine examples.

The shameless frauds of various kinds that are continually practiced in mining cases have brought discredit upon the entire business. In Deadwood a judge from the bench denounced the verdict of a jury in a mining case, where murder had been committed, as a disgrace to the law and insult to the court, and, bidding the clerk take the names of the jurors, ordered that none of them should ever be allowed to sit on a jury again during his administration. Such judges are rarely to be met with. The venality of some of the judges in Utah and some that were in Nevada when that State was under territorial government has passed into a proverb.

Men are pointed out in California and Nevada that have got rich by buying and selling juries, and in all mining camps certain men exist that are known as "affidavit men"—men who are ready to swear to anything for a consideration.

Of course no law will make men honest, but the major part of all perjury is committed in swearing to the "apex" of a lode; and by making side lines vertical lines you at one stroke take away all importance from and all value to this disputed point called "apex," which is the alpha and omega of nine mining suits out of every ten.

I believe every mining country should have a federal officer, with powers similar to those of the gold commissioners of the British colonies, selected if possible from the United States Army, by which selection men both competent and honest could be obtained for an office that would be a very responsible one as well as a most useful one. I make no apology for the style of this article, which I have written while *en route* from one mining camp to another. I have had no time to write either more briefly or more elegantly, but in the midst of other duties have hastily set down my ideas upon the subject, in the faint hope that in some way I may be instrumental in aiding your Commission in the encouragement of legitimate mining enterprise and in the suppression of fraud.

Very respectfully,

HARRY C. HILL,
San Francisco, Cal.

Captain C. E. DUTTON,
Secretary Public Land Commission.

Testimony of William Holden, Mendocino, Cal.

The questions to which the following answers are given, will be found on sheet facing page 1.

Answers to questions submitted by the Public Land Commission.

1. My name is William Holden; reside at Ukiah, Mendocino, California.
2. Eight years.
3. No, not for myself.
4. Practice as a lawyer.
5. In an uncontested case, six months. In a contested case, from one to three years.
6. The right to pre-empt but 160 acres in this country, where land is largely fit only for grazing, and that small amount being of no use or of small value as a grazing farm, parties wishing to procure a grazing farm are compelled to procure others to pre-empt so they can buy them out and thus get grazing land sufficient for their purposes; the remedy would be to permit them to pre-empt 640 acres of grazing land.
7. This county is composed of small valleys, chimere mountains, mountains or hills covered with redwood and other timber, and open rolling hills covered with wild grass and scattering timber.
8. The character of the land could only be fixed by proof before the land office where parties purchase; could not be done by geographical division.
9. Would not advise any change.
10. No other than permitting pre-emptors to take 640 grazing lands.

AGRICULTURE.

1. The climate is good; rainfall from middle of November to 1st of April; little or no snowfall.
2. Rainfall about 54 inches; comes when most needed, as the ground is dried and parched when it comes.
3. All.
7. Springs, Russian River, and many small streams that empty into the ocean might be used for that purpose.
8. My knowledge is limited; the fertility of the soil not injured; crops can be raised at an altitude of 3,600 feet above the level of the ocean.
9. There are no irrigating ditches in this county. I do not know.
10. None, or but very little for irrigating purposes.
11. None.
12. Four-fifths.
13. It is practicable; 640 acres.
14. Yes, to 640.
15. Two and one-half acres. The rolling hills will produce more grass than the level plains in San Joaquin and Sacramento Valleys.
16. About 100.
17. But few cattle.
18. Increases with pasturing.
19. But few cattle raisers. Can be safely confined.
20. Would be improved if range not overstocked.
21. Springs and creeks.
22. Between three and four.
23. It has.
24. No.
25. None, because they do not run together.
26. Two hundred and fifty thousand sheep; herds from 500 to 5,000.
28. There is, in the old surveys.

TIMBER.

1. There is a large quantity of timber land in Mendocino County—redwood, fir, pine, oak, and burr chestnut. There is a large belt of redwood and fir timber running from Sonoma to Humboldt County, along the ocean on an average 25 miles wide. Along the streams putting into the ocean, which are large enough in high water to float logs to the mills at the mouth, most of the timber has been cut and made into lumber.
2. Australian gum, if any.
3. I would sell as now provided by law.
4. I would classify as first, second, and third rate for timber purposes, and require proof as to class, when sold.
5. Yes; the sprouts putting out from the roots of the stump grow very rapidly.
6. Forest firest originate from logging camps and hunters. Rewards for prosecuting to conviction of offenders might prevent it.

7. Large timber thefts are perpetrated. When taken for ties or lumber for sale, heavy penalties should be inflicted. For mining or agricultural purposes, no. There are large wastes and destruction of timber not used.

9. I am of opinion that the laws would be more faithfully carried out if placed in the hands of local land officers.

LODE CLAIMS.

1. Have no or very little experience.

PLACER CLAIMS.

1. A very, very small proportion. Gold.

WM. HOLDEN.

Testimony of J. D. Hyde, register United States land office, Visalia, Tulare County, Cal.

SAN FRANCISCO, CAL., *October* 28, 1879.

J. D. HYDE, register United States land office, Visalia, Cal.

All fees for reporting evidence in land cases should be abolished.

Registers should have a seal.

Local land officers should have more authority.

Fees for salaries should be abolished, and a salary fixed for registers and receivers.

Experience of years is required to make efficient officers (United States land).

I believe in the present system of rectangular surveys of the public land, with improvements. I believe in more permanent monuments for public surveys; we have a great deal of trouble with settlers who are unable to find the stakes and corners of the old surveys.

Our district is agricultural. We have large districts of land now arid which can be eventually reclaimed by irrigation; a large quantity of water is now wasted. There should be a national or State system of irrigation.

There are large tracts of foot-hill lands only fit for grazing.

I believe in the pastoral homestead of, say, 3,000 acres on arid tracts.

There is very little timber land in our district—timber fit for building purposes; what timber we have is on the high mountain-tops. It should be sold in tracts of not less than 160 acres; from that to 640. The timber is now ravaged by fire; fire destroys more than is used. The timber lands in private hands would be better cared for than in public control.

Registers and receivers of districts should have charge of the timber lands.

Local mining recorders should be abolished, and claims for mines should be filed with the United States local land offices for preservation of title, for prevention of litigation, and certainty of description.

All mining controversies up to patent should be tried in the local district offices.

Registers should have the right to subpœna witnesses in land matters and to perpetuate testimony.

Local land officers (district) should have authority, as they take the testimony in and recommend cancellation of homesteads and D. S. pre-emption filings, to at once permit entry on the tracts by legal claimants, without waiting as now in some cases six months for cancellation from Washington.

Patents now require at least a year from issuance, when everything is regular. This should be altered, and patents issue at once.

Contested cases sometimes now hang up four or five years in the General Land Office at Washington. This should be radically changed. The local officers should decide many of the minor cases now sent up to Washington.

Government should pay for rent and fuel of offices of district land officers.

Testimony of E. O. F. Hastings, of San Francisco, Cal.

E. O. F. HASTINGS, attorney-at-law, San Francisco, Cal., testified October 15, 1879, as follows:

I have lived on the coast twenty years and have had some experience of the country. I have been a cattle proprietor. I was register of the land office at Marysville from 1858 to 1862, and I was subsequently an attorney and land agent for the State, and resided in Washington from 1870 to 1875.

Question. Give us your opinion as to the timber-land question.—Answer. Well. from observation and experience I am satisfied (and concur with the other gentlemen) that some action should be taken for the preservation of the timber. The course that I would suggest from my experience in connection with this land would be that the timber land proper—the timber fit for sawing and producing lumber—as soon as it is found that there is a demand for it in any particular locality, should be surveyed by the government at once. There should be a special fund set apart for the survey of those lands, and the alternate sections (either the odd or even sections) should be offered at public sale at stated times, at a minimum price. The other sections not disposed of, as a matter of course, should be held intact for the future.

By pursuing a course of that kind the wants of the country would be supplied and the country would not be denuded for timber. It would also be an inducement to persons owning the timber to see to it that waste was not committed on the sections not sold. It would be to their interest to do it. It would also be to their interest to prevent fires and depredations of every kind; and besides that the government, if it thought proper, could have agents for the purpose of protecting the unsold lands. That is all I have to say on the timber question.

Q. What have you to say about the arable lands?—A. The lands you have reference to I presume are the lands that are entirely unfit for cultivation without irrigation. I think these lands should be sold direct by the government, but without any special reservation as to quantity, for the reason that we know from experience in the past (and we can only judge of the future by the past) that vast bodies of land are now lying in this State of that character which have been surveyed and not disposed of by the federal government. Settlers could have occupied them if the government had made it possible for them to take them up in sufficient quantities for purposes of irrigation and improvement. That has not been done.

Then again we see that all kinds of maneuvering and trickery have been resorted to for the purpose of getting title of this land from the federal government. Persons were compelled to do that, for the reason that they could not buy them. It is a very grave question as to how long it will take to utilize these lands, even if you get water on them, and therefore I think the sooner they pass into the hands of the people the better. But the lands really susceptible to cultivation, and even the inferior lands that can only be utilized by the expenditure of large sums of money, I think should be held for the people—held sacred, and only to be taken up under pre-emption and homestead law.

Q. You have had practical experience in the matter. Now, in your judgment, can the pre-emption and homestead laws be consolidated and simplified?—A. Yes, sir; I think they can. It is a matter which I have not given much thought to, but I am inclined to think it would be best to increase the amount of the homestead claim from 160 to 320 acres. Of course that would be the maximum of land that a party could take under the homestead or any other law of Congress. I would repeal the pre-emption law.

Q. What do you think of the pasturage lands?—A. It is a notorious fact that the pasturage land, as distinct from the irrigable in California, is of such a character that in order to make it valuable and to enable persons to utilize it the land must be held in large tracts, larger than 160 acres, and in many instances 2,000 acres would be of but little value to a person for pasturage purposes. My views are that this land should be surveyed by the government as early as practicable; that is as soon as the demands of the settlements of the country require it. Of course it would be nonsense for the government to go five hundred miles away from settlers and survey these lands, but as they are required they should be surveyed and proclaimed or offered at public sale, at a fixed rate, in tracts of not less than 1,000 or 2,000 acres, and those not sold should be subject to private entry.

Q. At what rate?—A. That would be a matter for consideration. The government would have to determine that after the lands had been classified. I see no objection to increasing the homestead privilege, and giving persons the privilege of taking up the land under the homestead act. It ought not to be less than a section—enough to make a homestead.

Q. What would be the effect if this land were sold so that a man could obtain small quantities about streams and springs, so as to have the greatest number of water fronts? What effect would that have on the monopoly of water?—A. If it were practicable to do so that would be wise; but you take the foot-hills for instance, and there you may find one or two springs, and there might not be another spring or small stream for miles. It would be difficult to so apportion that land as to give parties access to the water. The only way that I could see that it could be done would be this: for the government to hold in reserve the water (with a certain amount of land in conjunction with it), and not sell it at all, but leave it open to the people and the public, the whole community being allowed to take their stock there to water. I think that would prevent monopolizing the land. Monopolies in this hilly land, in many instances, has resulted from that fact. When I was register parties would come

in and pre-empt one hundred and sixty acres of land; and when I asked them why they did not take more, they would say: we do not want more; we want the water; we buy this water, and we have the key to the whole country. That is the same way with the foot-hills—a man goes in and purchases the water, and that will give him the key to the whole country around. That is the way the lands have been absorbed and kept out of the market, and the people prevented from settling on them. People locate the water so as to control the land. It would be well to make the greatest number of pasturage farms front on the water and extend back. If the land could be disposed of in that way it would be well; but it is hardly practicable to get at it in that way. I am still of the opinion that the government should hold the water and the land adjoining intact, and not dispose of it. In that way it would leave the whole matter open, and there would be no such thing as monopolizing the land. All persons could have access to the water. I can well suppose, for instance, that there was a spring in a region of country, and that for miles around it was a desert, but the government should hold the water and the land adjoining, and not dispose of it at all. For instance, the forty acres upon which the spring was located should be reserved, just as saline springs are reserved. In the foot-hills, where the streams extend but a short distance, it would be difficult to make a reservation with regard to the land, but if it was possible it would be just as well to do it. Where the streams extend only three or four miles, I would reserve that from sale. That would hold the water intact for the entire community. Then the settlers outside of that would regulate the right of way to suit themselves. No party or set of persons could monopolize the water.

Q. Do you favor a State or national system of irrigation?—A. You have reference to the disposition and mode of appropriating the water by digging canals, &c.? That is a very difficult question, and one that I have not thought about sufficiently to pass an intelligent opinion upon. If, under our system of government, we could adopt some national system of irrigation it would be well; it would be the true course to be pursued, if it was practicable.

Q. What do you think about the right to work mines in lands that you have disposed of as pasturage lands?—A. I think that when the government has made a sale of the surface that it should pass title to everything in the land, mineral or whatever could be found there.

Q. Would miners be willing to agree to that?—A. I do not know. I presume there would be considerable opposition to it, but if those lands have been determined not to be mineral and the government disposes of them, how would it be possible for it to make reservation in regard to the mineral? If the government can do it for one year it can do it for fifty years. The government sets aside the sixteenth and thirty-sixth sections as school lands and recognizes the right of the State to them. I buy a section of that land, and twenty years from now I make a discovery of gold on it; would it not be reasonable to suppose that I own that gold, and would it be reasonable to say that I should not have it? Or, some one else comes along and discovers the mineral upon it after it was sold to me. It would unsettle matters very much, indeed, to give the party making that discovery the title to the land or even to the mineral.

Q. Would not the fact of any mining prospector having a right to go upon a man's land be a cloud upon the title to that man's property?—A. Of course it would; anything that interferes with the value of property certainly is a cloud upon the title to it, particularly where you cannot help yourself. I do not see that any special good results in making that reservation. If mineral is found upon a piece of land it will be worked. The general idea of preventing monopoly of mineral land or any kind of land is a myth. You cannot pass laws to prevent it which will ever reach it. This, of course, relates to mineral lands. With agricultural lands it is a different proposition. There men want to make homes and they should be protected in their rights.

Q. You have some knowledge of this strip of country which has been reserved for mineral purposes in the foot-hills, do you think it will be wise to restore that to settlement?—A. Yes; I can give you my experience in reference to the reservation of this land. The first reservation that was made in the State (that is of federal land after it had been reserved by the United States as public land) was in 1858. Surveys had been made (I speak now of land of which I have knowledge) in the early days commencing with 1853–'54. There was a large amount of surveying done following the line of the foot-hills and extending down into the valleys. Much of that land in the valleys and foot-hills were ascertained to be agricultural land, and was offered for sale.

About the time these lands were offered for sale mineral was discovered upon them and placer mines were being worked. I could see that the government by making the sale of that land would sell land that it ought not to, and I communicated with the department and stated the facts. I immediately received instructions to take testimony as to the character of these lands, as to whether they were more valuable for mineral than for agricultural purposes. Most of the proof was in favor of their being mineral land, and the land was withdrawn. I took the testimony, and a large amount of land was withdrawn from sale. The instructions and regulations were issued at that time. This land upon which I reported was in isolated tracts.

Subsequently the department issued a general order withdrawing all these lands from sale and reserving them as mineral, and then provided that the persons who desired to take up the land should make proof that it was of more value for agricultural than for mineral purposes, and the consequence is that the land has been held in this condition ever since.

Now, I think those lands which have been held for a long time, and upon which there are no mines, or upon which no mines have been worked, ought to be thrown open to pre-emption and homestead, and parties making the pre-emption and homestead entry should not be required to make the non-mineral proof. That is my view in relation to these lands.

Q. What do you think of the idea that where there is a cause for doubt as to the mineral character of the land the burden of proof should be upon the miner and not upon the agriculturist?—A. That would be the most rational course to pursue. The rule is the other way now.

Q. Would not that be practically inoperative?—A. Well, I do not know. The prospector always precedes the agriculturist. In connection with the foot-hills in this State there would not be much danger of a person taking the lands upon which there is mineral, because they have been rooting upon these lands for the last twenty years, and if there was anything there it would have been found long ago. Those sections up along the foot-hills that years ago were being mined have been worked out, and there is nothing there now. When you go higher up into the mountains, of course it is a different thing.

Q. From your knowledge of the gold land in that section what has been done with it; is it more valuable for agricultural than for mining purposes?—A. As to the portion of this land that extends down through the valleys from ten to twenty-five miles these lands have been so thoroughly prospected that they really cannot be so very valuable for mining purposes, and therefore they would be more valuable for agriculture, but when you get up into the mountains, where these gravel and hydraulic claims come in, that is a different proposition.

Hydraulic mining extends south, going a considerable distance, but the mines have not been developed, for the reason that they have not had a supply of water. For instance, up here in Tahama County there has been a discovery of gravel diggings where they had not supposed there was any at all. It has been a creek, called Deer Creek.

Statement and suggestions by Alfred James, register, Los Angeles land district, and W. H. Norway, deputy surveyor.

Before the United States Land Commission, Los Angeles, October 17, 1879.

ALFRED JAMES examined.

I have been in the land service of the United States now more than seven years as register of the Los Angeles land district.

The general character of the unappropriated land in this district is hilly and mountainous, suitable only for grazing, and desert lands. I refer now, of course, to the public lands of the United States. By "desert lands" I mean land destitute of grass and timber. It is not all totally unfit for cultivation under fair conditions, for some of the desert lands would be good land with water. I presume the proportions of desert and pasture land remaining in this district would be one-third desert and two-thirds pasture lands, and that two-thirds of all the lands are desert and pasture lands, compared with the whole area of land in this district. I mean public lands—that is, exclusive of private grants and lands disposed of.

All the lands in this district are unoffered lands, to be disposed of under the homestead and pre-emption laws. These laws are wholly inapplicable to the disposition of these lands, because 160 acres of land or 320 acres, the limit which can be acquired under the pre-emption and homestead laws, combined would be wholly insufficient for any man—would not support one man.

There is a great diversity in the character of the pasture lands, and upon an average it would require of the wild pasture land perhaps ten acres to support or sustain one head of beef. But this would exclude the desert land. Of the same pasture land it would take five acres or more to sustain one head of sheep. Sheep waste much more than cattle by tramping over the ground.

In some places there is good grazing for sheep and cattle entirely to the summit of the mountains. They range to the summits. In the San Jacinto and Cuyamaca Mountains there are good pasture lands upon the summit.

This district does not extend back to the Sierras; but I know something regarding the timber lands in the Sierras, for I lived there several years. In the Sierra Nevada where timber grows grass is very seldom found. Grass in the mountain ranges of

California is mostly confined to the Coast Range and the foot-hills. On the heavily timbered mountains there is no grass to speak of.

Of the Yosemite Mountains I do not offer an opinion; I don't know anything about them. I have passed over the Sierra Nevada by several different routes and have lived there for several years, but I know of no locality where there is any grass in the timber to amount to anything, except in some of the valleys, high up on the borders of Lake Tahoe, and in the tamarack region. The grass line runs from 5,000 to 7,000 feet, and it is frequently in considerable quantities, and is cut for hay. Hope Valley has an elevation of 7,000 feet and is covered with grass. Sierra Valley is a good grass and stock country and is very elevated; it has an elevation of about 6,000 feet.

Grazing lands of this part of California are simply held by mere occupation by sheep-herders. Much is occupied by foreigners in this portion of California. There are large tracts of land both in this and San Diego County which is so occupied by sheep-herders. I have known those men to start in business as herders for others in the sheep business and in a very short time gather up a flock of their own; and in some instances they become very wealthy, owning several thousand head, grazing them upon the public land, frequently to the exclusion of men who would be glad to purchase these lands if they could do so in sufficient quantities to maintain the business of stock-raising. Those herders are nomadic in their character. They drive their flocks over I don't know how much territory. I have heard considerable complaint from stock men in regard to those nomadic sheep-raisers from the fact that they frequently drive on the ranges occupied by other persons, and in some instances gather up stock belonging to such persons and drive them off in their own flocks. I might state, however, further regarding these sheep men that when feed is very scarce they often rent land from private-grant owners for a season, but this is always when they are unable to find sufficient feed on the public lands to maintain their flocks. It is their custom, as soon as grass and water fails, to move off. In moving they are protected by State laws, yet the moving of their stock is often a serious annoyance, and litigation very frequently arises out of the damages done in moving stock from place to place. They frequently make unnecessary delays, and so depredate upon private grants in order to feed their sheep. Besides this, moving has often the effect of evading the tax-laws to some extent, and in every instance more or less difficulty is experienced in collecting the revenues. They sometimes pass from one county to another and evade the taxes altogether.

I think the value of the pasture lands has deteriorated to a considerable extent, in my own experience here. This I attribute to the excessive grazing or overstocking and eating up of the seed, as the grasses grow entirely from the seed; all the valuable grasses here are produced in this way. In some places the pastures in this way become exhausted. Where there is no overstocking there is always enough to seed the pastures. The lands in this district have all been injured in this way; that is, the wild pasture lands. The water facilities are quite limited in California. Wherever there is water, such as a spring or rivulet or any valuable water supply, the land has been occupied.

Water can be obtained on nearly all these lands by the expenditure of capital, either by surface wells or artesian water; artesian water can be obtained nearly everywhere in California. There have been many successful experiments in obtaining artesian water, none of very great magnitude; but a great many artesian wells have been sunk upon mesa lands, and water obtained at a depth of from 200 to 500 feet. In the San Bernardino Valley artesian water may be obtained at from 30 to 60 feet, in an abundant flow. But those wandering herders have not yet been reduced to the necessity of sinking wells for water, from the fact that in the foot-hills there are yet some springs from which they can obtain water. They depend upon this natural supply; but the failure of water sometimes necessitates their moving.

As a means of approximating the size of their bands of sheep, I can only state that wool-growing is one of the principal industries of this State.

Collisions sometimes occur between cattle and sheep men. Cattle and sheep will not graze profitably upon the same lands. Sheep pasturage invariably deteriorates and destroys the quality of the pastures, and renders them totally unfit for cattle. I think, though, as a matter of fact, about all our cattle raisers have private ranches. Very few are dependent upon the uncertainty of the public lands for their grazing, while these are used very largely for sheep. Sheep-grazing would necessarily drive out cattle.

I am of the opinion that the public lands are being rendered, by this unrestricted herding of sheep over them, less and less valuable every year. Eventually it will be difficult for the government, under the present land system, to dispose of these lands at *any* price. The parties occupying have acquired no title, and yet they are in the occupation to the exclusion of all others, and their occupation is destroying the value of the lands so that it will not be disposed of.

There is no way under the present law by which it can be acquired in sufficient quantity to enable a man to make a living upon it. It can be acquired by homestead

and pre-emption in quantities of 160 acres, and then only by cultivating the land, which is an impossibility; and if the land is in the occupation of these nomadic sheep men it is not subject even to those laws for acquiring title, under the ruling of the Land Department.

In my opinion this character of land should be sold outright by the government, perhaps in unlimited quantities by private entry. I am in doubt about the propriety or feasibility of limiting the quantity which should be allowed to any one man or person, as an evasion of the law in case of limitation would be almost certain to follow as the result. One thousand acres of our average pasture land in this district would be insufficient for ordinary stock-raising by one man.

Under the present system of legislation, as well by the United States as by this State, sales of lands here are supposed to be confined to 160 acres, and the intention is to avoid the existence of monopoly. But the claimant can take up a pre-emption, then homestead, then a quarter section under the timber act, and as much homestead scrip as he can buy and pay for. He can in this way, if he is rich enough, get an unlimited quantity of land, so that the restrictions against monopoly are a dead letter; but it would be better to provide an easier way to attain this end, and a way that would avail to prevent perjury and fraud. Most people think that by acquiring land under the forms of the law they are not committing any fraud or perjury. Besides, it is a fact that there are no more lands in this district that are worth entering under the homestead or pre-emption laws.

A law to dispose of this class of land should be applicable to the whole country. I think an excellent plan of disposition would be to make the ownership—the actual possession at the time—of a herd of cattle or sheep the qualification of every purchaser of large tracts of public land.

Again, if you should limit the quantity of land there would be less inducement to a man to spend large sums of money in the work of developing artesian water.

As to price, the graduation law or system should, I think, prevail. Under that plan the better part of the land would be brought up and the remainder soon be sold. In fact all the land in this district worth $1.25 an acre has already been sold. As I have stated, the value of the land is decreasing by reason of overstocking. If the government is ever to dispose of these lands it will have to be done soon or it will not find a purchaser at four bits an acre, by reason of this deterioration.

Perhaps at this time 50 to 60 per cent. of the pre-emption and homestead entries in this district are perfected. Perhaps of those perfected one-half were entered legitimately under the law for personal purposes, and I see no necessity of maintaining the homestead law and the pre-emption law at the same time. The homestead law is defective as it stands. I know of a great many advantages which would accrue by material modifications.

The law itself (section 2297, Revised Statutes) provides that the question of abandonment shall be determined by the register and the receiver; but under the rules of the Department it is required that the register and receiver shall determine the question of abandonment primarily and send the report, with the evidence and their joint opinion, to the Commissioner of the General Land Office for his action, which, when had, is transmitted back to the local office—taking a period of from six months to a year—when the case is held for sixty days subject to appeal to the Secretary of the Interior, when, if no appeal is taken, the fact must be reported back to the department and a cancellation is ordered, and the local office is then notified from the General Land Office that the cancellation has been entered, whereupon the land is at length subject to entry for the first time—requiring in all a period ranging from one to three years.

To determine a question of abandonment there should be no further fact than the written abandonment and the surrender of the duplicate receipt by the party claiming in homestead cases, and the land so abandoned should be subject to immediate filing and entry.

I think as a general thing that perhaps half the persons applying for the cancellation of homesteads lose the benefits. The trouble is that under the present rulings of the department the person securing the cancellation of a homestead has no preference over any other person, and it is as subject to be entered by any other person as by such person—by the first man that applies—and the expense may have been very considerable to the party who has applied for cancellation. He ought to have the preference.

The party living nearest the land office has always the best opportunity; and the person making the application and spending his means is liable to lose his opportunity. I have known of cases where parties have received telegraphic communications from Washington of the cancellation of homesteads, and in such cases I have experienced some considerable annoyance and trouble. In such case the local land office is blamed and suspected by the party injured. I think it would be generous to let the homestead go upon record, where affidavit has been filed to the satisfaction of the local officers that an abandonment has been made; to authorize the local officers to receive

any application and act finally in the premises. The circumlocution now required to effect the cancellation of an abandoned homestead deters in many instances the person applying therefor from ever acquiring title to these lands.

The timber-culture act is of no material benefit in this district. Lands are usually taken up under this law for the purpose of holding the land beyond the reach of any other person. A person can hold those lands for one year without being subject to proceedings for abandonment at all, the requirements of the law for the first year being nominal. Then to clear the record of a timber-culture entry would require three years' time and a very considerable expense. It amounts to occupation without rent for an average term of five years. It might be safe to say that the land might be held without rent and to the detriment of all others for five years.

Twenty-nine entries have been made under the timber-culture act in this district, and none perfected. I know of no case where they have undertaken to comply with the law. There may be such instances, but none has come to my knowledge, and it is my opinion that none of the timber-culture entries upon the records of this district will ever be perfected.

About the desert-land law my opinion, so far as its application to Southern California is concerned, is that it is one of the best laws ever passed by Congress in regard to the public lands; because there is a large area of land, known as desert lands, which without water is wholly and totally valueless. The law, however, is in my opinion defective in that the quantity of land to be entered by any one should not be limited, for the reason that it requires the expenditure of very large capital in order to reclaim the land and render it fit for cultivation. The law, so far, has proved a dead letter in this district, although large sums of money have been expended under its provisions. The regulations of the department in regard to the proof required to establish a reclamation of desert land are so onerous as to render it impossible for a person to reclaim a piece of land under them. They require a person to put water upon the lands. It is required that the water be carried upon the land not only sufficient to raise crops, but that crops be produced by the introduction of water. The proof seems to contemplate that water should be carried over the whole of the lands, which is impossible in nearly every instance on account of the configuration of the land. Even the dimensions of the canals are required to be established by proof. I don't think the department should require that water should be conducted upon the entire tract before title should pass to him.

There ought to be some discrimination made in regard to the requirements of reclamation. For instance, a man may take up a piece of desert land and go to great expense to bring water upon it, requiring the land for vineyard purposes and for fruit-growing, in which case it needs a comparatively limited quantity of water, compared with what would be required to reclaim the land for the purpose of producing grasses for pasturage, as alfalfa, or for vegetable-raising, one-half the quantity of water required for raising vegetables or for alfalfa would be sufficient for the purposes of raising trees or vines, while the regulations of the department seem to make no distinction.

The gist of the law is, or rather ought to be, the reclamation of the land, and not the question as to who reclaims.

From the fact that the desert lands of California are valueless without reclamation the man who spends his money and time in an uncertain speculation of reclaiming such lands should be rather patronized by the government than otherwise.

Much of the land in San Bernardino County is desert land, and some tracts here and in other counties, notably in San Diego County, as also in Ventura and nearly all of Kern County which falls in this district. All of Kern outside this district is desert land.

In this connection I will say that it would be impossible to reclaim, even under the most liberal legislation, a very great percentage of this land, for the want of water. Only a small percentage of it ever can be reclaimed.

If the law was more liberal in its terms and provisions, parties might be induced to spend some capital in sinking artesian wells, and by that means much of the land might eventually be reclaimed; but, as the law now stands, capitalists are prohibited from undertaking such enterprises.

Timber lands in this district are very limited. There is a very limited quantity of timber which could be manufactured into lumber situated in the San Jacinto and the San Gabriel or Cahon Mountains, inaccessible without the expenditure of large capital for the building of roads. As this timber is on the northern slope of the mountains, it is inaccessible except by building roads, as it must be brought over the summit. This would render fluming impracticable. The timber is not of the better class, however, I think. It is principally pine and fir. The quantity of good sugar-pine is very limited.

There has been no title from the United States to these lands, for the reason that title can be acquired only by homestead or pre-emption or the timber act, which is inapplicable to that class of timber land. The trouble is that a man cannot get on these lands without an expenditure of $20,000 or $30,000, and then could get only 360

acres. The timber has not been appropriated, nor is the timber here adapted to building purposes.

At San Bernardino the timber is obtained from the mountains, and some of that timber was appropriated under indemnity selections. One great mistake is that all the wood lands have been recorded by the department as timber lands, and parties have been prosecuted for cutting timber only fit for fuel for domestic purposes; and this notwithstanding that the only source from which the population of the communities in this part of the county have been able to obtain wood for domestic purposes, for fuel, is from the cañons and the mountains and isolated spots of scrub-oak and other classes of timber growth upon the public lands.

If the government would provide any means by which the title could be acquired to this class of land, such as is yet valuable for the wood growing thereon, it would be readily purchased. But there being no means of acquiring title, and the necessity continually existing for fuel for domestic purposes, these lands in a few years will be divested of timber in spite of the efforts of the government to the contrary, and thereby rendered wholly valueless.

The government might receive no inconsiderable amount of money for these lands, but a very great proportion has already been stripped of wood, and can never be sold for any price.

It would be one of the most difficult things possible to cover this case by general legislation, from the fact that the timber is found growing in isolated parcels in the mountains and cañons, being in nearly every instance inaccessible without the construction of roads at great cost, and containing no land fit for agricultural purposes whatever. It would be impossible to sell this land out in regular subdivisions as under the present system. They could be sold only in parcels under special survey, as placer claims are now sold. What I have said applies to every portion of Southern California.

The better plan would be to sell the timber, reserving the land, so that the government would then be enabled to reserve the new timber, if any such there might be; and if the thing were possible, in such case there ought to be some legislation providing against waste.

The wood lands have been largely damaged by fires, and these fires have often occurred from the negligence of hunters and sometimes of mining prospectors who carelessly set fire to the timber.

I will add to what I have said about the homestead and pre-emption laws. The law requiring the publication of notice in contested cases is a useless law and should be repealed. It imposes an additional expense of from $5 to $10 to no purpose whatever, for the reason that when the records show an adverse claim, personal service is necessary, notwithstanding the requirements of publication; and also the law requiring the publication of notice of final proof in pre-emption and homestead cases is entirely useless and adds to the expense and causes unnecessary delay in the entry of land. The law is cumbersome and difficult of execution from the fact that it often occurs that when publication is had the witnesses named in the publication at the expiration of the time set for proving up cannot be had, and even when they can be had there is still in the way of closing up the case many difficulties and hundreds of perplexities to the local officers. It is a cumbersome, useless, and unnecessary law in every respect, and I have never been able to see the first particle of public good from that law.

In general terms, again, I don't believe that the public is benefited by taking testimony other than by the register and receiver, for various reasons, and among others that the testimony so taken is very seldom satisfactory and in nearly every instance is incomplete and leads to much correspondence and delay, compelling the local offices to keep proofs open for a greater or less time after the proof is taken. In many instances, if not generally, it costs more than to come before the local offices. Often the testimony has to be returned for correction, and entails unnecessary labor upon the government. We have found in the experience of this office since the rule went into effect that our labors have been greatly increased. It would be a wise regulation of law to empower the register and receiver to visit remote localities to take proofs, and it would incur no additional expense upon the government. It would also facilitate business if the register and receiver were authorized to issue subpœnas and to compel the attendance of witnesses in contested cases. Under the State laws, or by calling in their aid, we are in some measure empowered to bring in witnesses, but it would be much better if the authority were direct.

From my experience with them I should also recommend that the local mining regulations of mining districts be abolished, because they are so easily evaded and so seldom complied with. The mining records under the local regulations are copied in a very loose and unsatisfactory manner. Mining recorders are generally irresponsible persons, not under bonds, and are easily used for the purpose by those that wish to evade the law. Mining districts are irregularly organized. There is no established rule as to the number of persons necessary to organize a district. It may be by three per-

sons, and I have known districts organized by two miners at a miners' meeting of themselves—the meeting called by themselves upon notice sent to each other; one presides and the other is secretary. There is no evidence needed as to whether they are miners or whether they are citizens; all this has to be assumed.

Having elected themselves president and secretary they pass a code of laws to govern the district, and pass such laws as will subserve their own interests, and proceed to record the claims they cannot hold themselves by "dummies."

Some of these districts are nearly as large as the State of Rhode Island, often as large as a whole township. Some may be comparatively small.

It often occurs that a mining recorder is elected, makes a few records, abandons the district and takes the records with him.

The boundaries are designated without survey, often by illiterate men, and so very frequently overlap boundaries of other districts. It also occurs that a second mining district is organized, and the old laws repealed and new ones enacted.

Where a mining claim is taken up under local laws and regulations it frequently occurs that, in order to avoid the work necessary to comply with that law, about the time the year would expire the claim is simply relocated by the same parties.

Under these laws the first act is to stake off the lode and stick up notices, which are often vague and very indefinite in their terms, being written by illiterate persons. The second step is to have it recorded.

There is no restriction upon the recorder to regulate these notices or records. He is not required to go upon the ground generally. There is no security against the alteration and destruction of these records. The personal integrity of the recorder is all. These records are the foundation and inception step to perfect a government claim. Under the regulations of the department the local registers are required to certify to the entries from his records, and, having no seal, he is required to certify before some person having an official seal. No other certificate of its genuineness is required. These entries are almost invariably very vague and indefinite.

In many of the mining districts recently formed the laws of the United States in regard to the location of mining claims have been established as the laws of the district, showing that the United States laws are more satisfactory than any local laws that the miners have made.

In place of these local laws I should suggest a general law of Congress. I should require the notice to be filed in the local land office, the same as a declaratory statement is filed for agricultural land.

It would be well to have the locations made by official surveys, if it could be done without duplicating the survey and causing the expense of another survey before the issuance of a patent. There would not be any necessity for a further survey. The only objection to this would be the expense of locating the claim. But, in answer to this, it would prevent people from locating in bad faith, and from incumbering the districts with fraudulent claims, which have become very common.

Two-thirds of the claims now held in this district, with which I am acquainted, are held without doing the necessary work required by law, merely for purposes of speculation.

I should further limit the time within which parties filing should come in and purchase from the government after filing; that there ought, first, to be time—say, two years—given for development. I think that the expenditure of money should be more satifactory than the performance of acts to constitute the proofs.

I think, also, that the same rule would apply with advantage to government lands, and I think all controversies between parties in those cases should be settled in the local land offices, and it would save half or two-thirds of the litigation.

As between the square or dip location, I should favor the dip location. In deep mining the square would fail in many cases. In deep mining, under the square location, the lode would often extend beyond the limits of the claim. Fifteen hundred feet would be sufficient to cover the dip in most cases, perhaps, but not in all. In the Comstock Mine the dip covers 2,900 feet. For practical purposes, generally under the square location 1,500 feet would be sufficient.

By a law designating the initiatory steps to be taken and securing the title to mines the government would derive a considerable revenue, from the moneys of which it is now deprived without any detriment to the miners themselves. This would throw the mines into the hands of legitimate, *bona-fide* operators. I have known of many instances where companies have held claims in districts which they never saw and without complying with the laws for years, simply by procuring certificates that work had been done and by relocating claims.

I should not allow the same parties who have forfeited their claims by abandonment to rerecord them. Yet I don't think that it would be well to restrict miners to one location as in pre-empting land, because the business is one of the most uncertain pursuits. If a man devotes himself to the business of mining and risks all upon one mine which is undeveloped, he is resting his efforts upon a very frail claim. It is true that miners are migratory, going from mine to mine in pursuit of something better, but still I think it would not be well to confine one to one claim.

If the law should compel one to initiate his claim by having a survey made, the cost would confine them to single claims with more tenacity and do more, perhaps, for their development. But if one claim prove unsatisfactory, I think there should not be a law that would compel him to quit the business.

In matters of controversy between mineral and agricultural claimants, if the land is returned as mineral lands the burden of proof should fall upon the claimant claiming it as agricultural.

We have had whole township plats withdrawn here simply upon the affidavits of persons interested in mining—plats that have been withdrawn for years to the detriment of persons desiring to settle as agricultural claimants, notwithstanding that upon those lands no mining developments have ever been made.

I think it would be the preferable way for the government to classify her lands and then adhere to her classification at all events, no matter what subsequent experience might show. At present, as the law is, the sale at best is only conditional, notwithstanding the settler thinks himself secured by his patent; for if his land is held and patented to him as agricultural and should be found to be mineral afterward his patent is no protection. I think if the sale is made by the government to the individual, either as agricultural or mineral, it should be final. There should be no reservation, and all controversies should be settled. But the patent should be final so far as the mere character of the land is concerned.

I don't recollect whether I stated, but I intended to have done so, that the homestead law, like the pre-emption law, should be retroactive. Rights should date from the day of settlement, whether upon surveyed or unsurveyed lands.

As to private land claims, the segregation ought to be done by all means, and speedily. It never will be done if left to the claimants to do, because it is to the interest of private grant claimants not to do it. I should suggest that when it is done permanent monuments of some sort be erected, because where lines of private grants have been surveyed settlers desiring to enter have no reliable means of knowing where the lines are run between the private grants and the public domain. As it is, the corners when established are very soon obliterated, monuments that mark boundaries are often in obscure places and very difficult to find. It is always for the interests of the private claimants not to segregate, because they have the use of the public domain for stock purposes. What I mean by segregation in this instance is the separation of the private land claims from the public lands of the United States, so as to inform the public where the boundaries are by marking these boundaries in a conspicuous manner.

It has been the practice of the department, when the boundaries of private ranches are undetermined, or where there is any question about the boundary, to withdraw from public entry the land in the neighborhood and sometimes to a considerable extent.

Such cases exist here where plats of public surveys have been withdrawn for years pending the settlement of private land claims. Whole townships have been withdrawn when only a portion of the land is claimed. Parties frequently come to the local offices and want to make their claims to lands, but find it impossible to file upon these lands, get discouraged, and give it up. There is a great deal of public land here in just this condition. On account of the San Jacinto ranch we have three townships suspended.

In the event of a compulsory segregation, I think the government ought to be at the expense of the surveys instead of the claimants. I think it would be to the interest of the government to do it.

There should be some process by which the immediate restoration of lands would take place upon a forfeiture of a railroad grant. A vast portion of the public lands in this district is withheld from pre-emption and homestead by reason of the withdrawal for railroad purposes, notably on behalf of the Atlantic and Pacific and the Texas Pacific Railroad Companies. These withdrawals cover three-fifths of this entire land district. It takes an average strip through the entire district of about 120 miles in width on an average.

This withdrawal withdraws all the odd-numbered sections from disposition of any kind, and raises the price of even-numbered sections to $2.50 an acre, which price is in excess of the value of the land.

A great many settlers are clamorous to make entries on these lands, and are prohibited from doing so. This paralyzes the disposition of the lands in this land district. Many of those lands are now occupied through the necessities of the people, and a large number of applications to file upon these lands, particularly within the withdrawal of the Atlantic and Pacific Railroad Company, are now before the department. Much litigation and much suffering hereafter will be occasioned by the attempts to enforce these grants. The attempt would be attended with much difficulty and even resistance.

Every citizen interested in the prosperity of Southern California feels an abiding interest in the restoration of these lands to the public domain.

Testimony of William Neely Johnson, San Francisco, Cal.

WILLIAM NEELY JOHNSON, of San Francisco, examined.

I organized the land office at Sacramento in 1867, and was register until about May, 1869.

The timber lands of the State of California consist of two belts—one a belt that ranges near the Pacific coast, along what is here called the Coast Range, except that the Coast Range, as defined here, extends back northerly from San Francisco some 40 miles, while there are valleys which make the timber lands commence three or four miles from the Pacific coast. The timber runs up into an altitude of 1,500 feet, and going westerly about 40 miles, where you find what is called the Coast Range proper. The next belt is on the Sierra Nevada Mountains. Therefore I say there are two belts of timber. I concur with gentlemen who have testified here in their classification of the timber lands—Mr. Redding and others.

The difficulty of dealing with the timber lands arises from the impracticability of carrying out the present system of national law, which is in effect inoperative. That is my experience as a government officer. In a country like this villages have to be built up wherever there is a mining or agricultural center, and if the timber lands in the vicinity are not surveyed, or if the people cannot buy timber with which to build houses from the government, they will take it without permission. They do not regard such taking as stealing. It is public property, and if the government does not pass laws under which they can obtain it legitimately, they will take it anyhow. The Central Pacific Railroad was obliged to have timber for the construction of its road over the mountains, and the timber was given it by law. But the question came up as to whether the railroad company would expend considerable sums of money in erecting mills to manufacture their own lumber or give out contracts to supply it, which latter they did, of course. Mills were constructed that run out from 80,000 to 120,000 feet of lumber every twenty-four hours. I know mills near Truckee that turn out that much lumber. They were erected upon government lands. Where they could get a survey made they would pre-empt a quarter section, build a mill on that, and use the timber on all accessible lands.

The government can do nothing with the present timber lands without their being surveyed.

In my judgment stumpage is only an incentive to people to commit trespass upon the public timber lands. I found that people who had made large disbursements were getting their employés to file declaratory statements on timber lands under the pre-emption laws, and then cut the timber off, and the pre-emption would never be completed. The money was furnished by the mill men, and the laws of the United States were simply an encouragement to perjury. If you are going to prevent perjury you had better sell the timber lands in altitudes from 4,000 to 6,000 feet above tide-water, where the seasons are too short for practicable or profitable agriculture. Lands at such altitudes are of a peculiar softness, but have not sufficient strength to raise any of the cereals. You can raise vegetables, though, to some extent. There are little valleys where grain might be raised, but they are so inconsiderable in number and area as compared with the entire slope of 450 to 500 miles, having a width of 25 to 30 miles, that they should not be taken into consideration at all. These valleys are principally used for pasturage purposes. The timber on the mountain sides is valuable, but its great distances from market would make it impracticable for any individual pre-empting 160 or 320 acres to bring it to market. To make this timber available it must be worked by combinations of capital. In this belt there are sections very sparsely settled. If it was the policy to preserve part of the timber, it should be done by reserving trees of a certain size; but I have uniformly found that seeking to protect timber by employing agents was a failure. A man perfectly familiar with a certain locality might be efficient as a timber agent there, but he could not guard any considerable territory. I regard the employment of such agents as a failure, and I do not regard such a policy worthy of consideration by intelligent gentlemen.

I think the timber in the belt of the Sierra Nevada should be sold in sufficiently large tracts to justify persons engaged purely in the lumber business in erecting suitable mills. The price must depend upon the locality and upon the market. I do not believe a practical lumberman would engage in such an enterprise unless he could purchase directly from the government at least two to four sections of land.

I do not believe the acreage should be taken into consideration in fixing the price for the sale of the timber in this belt. The price should cover all expenses incurred in making surveys, negotiating sales, issuing patents, &c. Perhaps $2 an acre would cover this, but the people could well afford to pay $5 per acre. In the high altitudes the cost of surveying, plotting, &c., is great, and is much more expensive in some localities than in others. This could be determined from the township plats returned from the local offices.

I do not believe it is good policy for the government to withhold our timber lands from sale either to individuals or to capitalists. I have witnessed for more than

twenty-five years past operations in timber lands, and have almost uniformly found that where an individual locates or purchases a *small* tract of land in the timber belt he has voluntarily transferred the same to somebody else, or could afford to hold and work it himself.

The timber belt upon the Coast Range of California, say from Santa Cruz County northerly, is composed of a different character of timber from that which grows upon the Sierra Nevada belt. The redwood timber grows along the Coast Range, passing from Santa Cruz northerly from San Francisco. Santa Cruz, Sonoma, Mendocino, and Humboldt Counties as far as the Humboldt River have a fine growth of large redwood timber. The trees grow closely together and are very large and tall. I have traveled through this rich belt of timber from Mendocino County to the Pacific Ocean, a distance of 20 miles, over a road which was cut out by the government as far back as 1856–'57. The timber along this part of the coast beltgrows so thickly that it is often the case that when a tree is felled it lodges between two others, and there are many places where perhaps the sun has not reached the ground in centuries. These trees are from 10 to 15 feet in diameter through the butt, and range from 150 to 250 feet in height. Many of them nearer the coast will reach from 75 to 100 feet with scarcely a limb. I have seen trees cut down in the redwood belt along the Pacific coast where 12 to 14 feet above the ground they erected a scaffold and the chopping men got up about 12 feet high where they cut the tree. I have seen trees cut there where the timber would be 15 feet wide 6 feet above the butt.

The growth of the redwood tree is very slow. The soil along the Pacific coast in front of the Mendocino reservation is a dark loam that appears to be very powdery. The employés of the Indian reservation planted potatoes one year and had a good crop; the second exhausted the strength of the soil and afterward they could not grow anything upon it; and I found that there is a rank vegetation on this range and where you cut the timber on the eastern slope there is a fair grass following the timber that sheep can live on; but I know of no place on the western slope where you could support one sheep to the acre. I think that as a general rule in this country you can safely pasture two to three sheep to the acre where you have a fair average rainfall. I would give on an average two sections of fair land for a pasturage homestead. I like the idea of a pasturage homestead. In California we can raise sheep enough on that amount of land to make it profitable.

The *Eucalyptus* is of a very rapid growth and will acquire a diameter of 6 inches in four years. It does not need a great deal of water. Mr. J. T. Stratton planted *Eucalypti* upon the side of a mountain which was considered worthless for anything in the way of agricultural products, vegetables or cereals, and they flourished splendidly. He is supplying slips to the whole State now. There are several varieties of fine hard-wood trees in the State that are useful for manufacturing purposes.

There is not a sufficient amount of rainfall in this country to render the land practicable for agricultural purposes without irrigation, and the supply of water is hardly sufficient for that purpose. Therefore, as the land is worthless without the water, the two should be inseparably connected.

I have had considerable experience in mining, both as a practical miner and as an attorney and agent for them, and I have come to the conclusion that the placer lands, which are chiefly situated in the foot-hills of California, should be sold immediately by the government. Let them pass into private ownership, and there is scarcely a quarter section that cannot be utilized for the finest qualities of fruit and vegetables. They form splendid and healthy locations for homes for families, and they are infinitely more valuable for agriculture than for mining. Fifteen or twenty years ago the government, simply upon a superficial and inefficient survey, without proper examination, reserved as mineral lands hundreds of thousands of acres, affording pretext for much litigation as to their agricultural or mineral character. While register of the Sacramento land office I had occasion to pass upon eight or ten thousand acres of land in certain counties which had been suspended by an order from the Land Office in Washington in 1859, and withdrawn as mineral in character and withheld from homesteading. When an examination was held we found that there was not one-quarter section in ten that had not had holes sunk in the ground here and there by miners fifteen years before, and yet the land was purely agricultural. The same thing will apply to the counties of Nevada, Sutter, Calaveras, Amador, El Dorado, Butte, and all the counties that lie along the foot-hills in what is regarded as the mineral belt. This would embrace the hillsides north of a certain latitude which are good for grazing purposes. They have wild oats growing upon them in many of the counties, and sheep and cattle can remain in them the year round. They will find wild oats growing upon these mountains where you could not raise anything—but south of a certain belt this is not true.

As regards the number of acres of average lands required to sustain a beef in California, I know of no lands in the State from the Mohave Desert to Del Norte that have not natural grasses; though in some seasons there are no grasses at all. My idea is that 25 acres would sustain a beef.

I would suggest that the government turn over to the States all arid lands that are not worth settlement under the homestead and pre-emption law, and that the proceeds realized by the States from their sale be devoted to their reclamation to make them arable for farming.

I would stop the system of hydraulic mining where it was injurious to agriculture. I would sell the placer lands as placer lands, and the purchaser should be allowed to use his land for any purpose he pleases.

I would place the jurisdiction of timber lands, with strong restrictions, in the hands of local land offices, and I would have an act of Congress punishing perjuries committed before the land officers; and I would make the statute of limitation five years instead of one, for perjury in the land office cannot often be proven in less time.

In my opinion, the forms in the land offices could be simplified. Under the present arrangement the settlement of contested cases is procrastinated and not expedited. The registers and receivers occupy an executive, administrative, and judicial position. In their judicial capacity they pass upon and decide important cases, sometimes involving many thousands of dollars. A litigant comes before an office where his case is to be decided and asks for a subpœna for a witness. Under the present system the local officers as a matter of courtesy issue it, but there is no law compelling the attendance of witnesses. There should be some way of perpetuating testimony in the local offices; they should be allowed to use the seal of the General Land Office with their name in it. I see no need of a receiver any more than of a fifth wheel to a coach.

I would change the present law of Congress concerning the rights of miners to take up mining claims. I would have the register of the local land office the recorder of all mining claims in his district. I would give the register the power to take and perpetuate evidence and afterward to certify it up to the courts. I would authorize them to take testimony in a contested mining claim before it is certified to the courts, and then if they deemed it a case of contest, after having been passed upon by the Commissioner of the General Land Office, I would refer that case to the courts, but not otherwise.

Testimony of George W. Jones, Alpine County, California.

The questions to which the following answers are given will be found on sheet facing page 1.

EXCHEQUER MILL,
Silver Mountain, Alpine County, California, October 14, 1879.

GENTLEMEN: Having devoted the greater part of the past twenty years to prospecting, mining, and working various kinds of ores in Colorado, Utah, California, Canada, New Hampshire, and the Lake Superior iron and copper regions, I feel competent to answer some of your inquiries appearing in the Mining and Scientific Press of the 27th ultimo.

The first question is answered in the above.

Second. The width allowed by the present law is not sufficient to cover the width of all lodes in all cases in all sections of the country. As far as my experience extends to Colorado, outside of Leadville district the ledges range from 3 to 10 feet in width. My experience in that section, however, was at an early day; wider formations or fissures may have since been discovered. I discovered several veins in Utah that were 60 feet in width. I opened what is now known as the "Jordan" Mine in 1870, and exposed a body of ore 60 feet in width. I was defrauded out of the property by the workings of the old law regulating mining locations. The old Telegraph Mine is a continuation of the same ledge to the east. In this county, in Monitor and Silver Mountain districts, it is quite different. Here I find *eight* formations; each formation consists of a group of veins or fissures, all bearing the same course and dip, showing the same outcroppings and producing the same combination of minerals (when developed) peculiar to themselves. The first and oldest formation produces gold and magnetic iron; the latter, when crushed and washed in the form of black sand, runs north 14° west, and dip 32° west of the vertical line; they are on a large scale, ranging from 300 to 2,000 feet in width. The gangue is pure quartz stained with oxide of iron. The second formation consists of a ledge ranging from 120 to 150 feet in width, running due north and south and dip 14° west, from 100 to 500 feet apart. This belt is about five miles in width from east to west, cut off by the granite range west of Silver Mountain, and porphyry or trap east of Monitor. I have not traced their full length from north to south. This formation produces gold and silver of about equal value, copper and lead in very small quantities, zinc and iron pyrites; the gangue is soft decomposed quartz, almost a clay. The ore is well distributed through the veins, but is richer near the east or footwall side of the vein. This formation would be of immense value if other later formations had not distorted and mutilated large portions of it along their course.

The third and fourth have at no point been sufficiently explored to warrant my expressing an opinion as to their value; they both run north of west and south of east; the former dips to the southwest and the latter northeast. The fifth is composed of a group running *magnetic* north and south, dipping to the east. (Magnetic variation here 16° east.) They are thoroughly impregnated with iron in the form of oxide near the surface and sulphurets at lower depths, but do not produce the precious metals, as far as explored, in paying quantities. I would call your attention to an important fact that I have discovered in regard to this formation. The magnetic needle indicates the *true north* when passing over any one of this group. (All other fissures appear to have no effect upon the compass.) They are from 60 to 500 feet in width, and are from 50 to 600 feet apart. Ledges of the sixth formation run west 16° north and dip north 16° east, and produce black oxides and sulphurets of copper, except at the point of contact with an older mineralized vein; it then contains the combination of metals belonging to the ledge it is crossing, although it preserves its own stratification and gangue. I attribute this to the precipitating power possessed by the metal belonging to that particular group; they are 120 feet in width, a few attaining a greater width. The seventh formation bears north 60° east and dips 8° northwest. The eighth bears north 40° east and dips southeast. The last two formations have *not had sufficient age to become mineralized;* they show prominent outcroppings, as the action of the elements have not had time to decompose and obliterate them; their width range from 10 to 600 feet. As they are quite numerous, they destroy a large portion of the older mineral-bearing ledges, and *serve to deceive and mystify the miner by cutting off ore deposits* and *leading him away from the valuable ledges.*

I find similar combinations in Colorado and Utah, but as the formations are comparatively narrow, the mineralized ledges are not cut up and displaced to the same extent they are in this section of the country.

In Bingham Cañon, Utah, I found several naturally worthless ledges being worked profitably, owing to the fact that the fissure worked cut a group of mineral-bearing ledges, enriching the otherwise worthless ledge, producing ore deposits in the form of chutes or chimneys. Prospecting beyond the line of contact with the mineralized veins, the walls and stratification remained perfect but destitute of mineral.

4th. The courses of all fissures, as well as their width, dip, and comparative age, can be readily determined without any outlay of capital in developing, if proper means are employed to that end.

5th and 6th. Answered in my reply to the fourth.

9th. As previously stated, I have found ledges in this section of the country, the width allowed under the present law not being sufficient to cover the full extent of the ledge.

10th. I have thus far found that each group of ledges carry their regular courses, varying but three or four degrees, allowing for elevations and depressions of surface and the dip of the ledge. If they appear to otherwise curve or present an angle, it is owing to the presence of a later formation that may run nearly the same course; the dip will also probably change, although it may be but slight, and the gangue and combination of minerals will also change.

Having other facts to communicate and fearing my statements may be too lengthy, I will not undertake to answer the balance of your questions at the present time. I will state that I find each and every fissure possessing an *electric current* of its own independent of all others. I have been investigating its bearing upon mineral deposits for the past twenty years and have given you some of the results of my discoveries. If the laws of nature were perfectly understood (and it is only a matter of time, as they are as plain and can be as readily comprehended by those who will devote the necessary time and study as the movement of the planets) there will be no occasion for the numerous litigations that are now hampering this industry, and the money now being expended in developing worthless veins would be employed in working the older mineralized veins and produce remunerative results.

The "Comstock" was a source of wealth to the country while it was worked in its true dip to the west. When, reaching a later formation dipping to the east, the identity of the old ledge was lost and destroyed and the later-formed ledge was followed in its dip until reaching the crossing of another old mineralized vein, cutting it in such an angle and dip as to form the "kidney" shape deposit found in the California and Consolidated Virginia claims. When the workings pass below the point of contact the ledge resumes its naturally barren condition until, at still greater depth, it may cut another of the mineral-bearing group. The fact that a drift has been run or a diamond drill sent into the "west country" does not demonstrate the incorrectness of my statements, as I find here fully four-fifths of the ground covered by the older formations also occupied by those of later date, and but few of the latter retain the wealth of the former at the point of contact. The older formations show no outcroppings but create depressions, as both chemical and magnetic forces decompose the ledge matter, rendering it more sensitive to the action of the elements. I could give you additional facts and information gathered from numerous fields that I have vis-

ited, but knowing the strong prejudice existing against the idea that any knowledge can be obtained beyond the point of the pick and drill, I shall await the result of my first communication in order to know if your commission is disposed to make use of these discoveries to assist in preventing the present waste of time, labor, and treasure under the present system, or rather want of system, in mining.

At the present time mining companies, as a rule, are legalized lotteries where the manipulaters take the prizes and the general public the blanks, the wealth of the West being absorbed into the overflowing coffers of the few.

For various reasons I attribute mineral deposits to magnetic force or conducting power, as I find metals that are the least sensitive to magnetic influence are found in paying quantities only in the line of the older formations. Again, I find samples of the second formation, showing native gold, native silver, black sulphurets of silver, silver glance, zinc blende, pyrites both iron and copper, all separate and detached each from the other in the same sample. If the deposit had been formed by heat in a melted condition, or by infiltration, the deposits would have been in the form of an alloy. The iron and copper ranges of Lake Superior are but a few miles apart. If the deposits were formed by any of the means now advocated by scientists, some of the Portage Lake copper would have found its way into the iron range of Marquette from the latter point to L'Anse Bay. Again, here I find the fifth formation producing iron only, and the sixth copper, each group thoroughly impregnated with their respective metals in close proximity to older formations producing the "noble" metals. The "Old Telegraph" and Jordan mines of Utah (the sixth formation) have yielded and are yielding (at present more particularly the former) immense masses of lead ore, but containing only from 11 to 25 ounces silver with a trace of gold, per ton; except at the point of contact with older formations, where bunches of ore assaying up into the hundreds of ounces are found. Again, the Winnemuck, also of Bingham Cañon, (a vein of the fourth formation), yielded average assays of 60 per cent. lead and 60 ounces silver per ton; at the crossing of two older formations masses of ore assaying 500 ounces per ton was extracted. A slip of eighty feet displaces this vein in the lower workings. I could cite other instances to prove the correctness of my theory. From my own observation I should judge that fissures start from a great depth, probably many miles (perhaps thousands) from the point of outcrop, breaking through the earth's crust at points presenting the least resistance, where fractures have been caused by earlier upheavals, forming vast mineral belts consisting of groups of ledges, each group possessing different combinations or variety of metals, as the starting-point of each group (as they all have different dips), may be many miles away from other groups, and cutting through metallic deposits, the electric currents impregnating the fissure with the variety or varieties of metals encountered along their course.

I am now in the employ of the Isabelle Gold and Silver Mining Company, Limited, of London; Lewis Chalmers, esq., manager. This company is engaged in running a long tunnel to strike a group of ledges at a great depth. Several months ago I made a survey of the various formations and stratifications they would encounter, giving their cleavage and fracture. They are now in something over 1,100 feet, and the workings thus far demonstrate the correctness of my survey. I would state that there is nothing in the appearance of the formation where exposed at the surface to indicate the various changes they have already and will in future encounter.

Yours respectfully,

GEO. W. JONES.

The PUBLIC LAND COMMISSION,
P. O. Box 585, *Washington, D. C.*

Testimony of Charles Justice, of Wheatland, Cal.

CHARLES JUSTICE, of Wheatland, Cal., testified at Marysville, October 27.

I have lived here for nearly thirty years. I came here in May, 1849. I am somewhat acquainted with the progress of California settlements among these valleys. I purchased a farm on Bear River in 1854 and came to reside there in 1857. I was in the cattle business up to that time.

Question. What has been the progress of settlements since that time? How early did they commence farming here?—Answer. Mine was about the first farming done here. There was a little farming in 1853. It steadily increased since that time until 1862, and then it commenced to decrease. The waters in the river in 1862 commenced to come down so muddy that they filled up the channel of the river and overflowed the farm lands on the river banks. That was the commencement of the filling up of streams. I commenced farming in 1854. I sowed a large crop of barley. At that time when the water was low it was about 16 feet from the surface of the land to the surface of the water. The water was still deeper than that. The water would fall in the river some 16 feet. It then commenced to fill up until the whole channel of the river

became entirely filled up. I built my house in 1854, and I placed it about 2½ feet above the levee on large blocks of wood so there would be a circulation of air under the house. I remained in my house until 1867; previous to which time the whole of the channel became filled up; in fact the mud and sediment and sand got out on the land, and the water, some two or three winters ago, got into my house while I was living in it. The first time it ever got in there I heard a sort of rumbling noise, and I said to my wife, there must be some water running somewhere; so I put my foot out and stepped into the water on the floor of the house. We moved away from there in 1869, and since then the water has got up to within about 3 feet of the ceiling of my first story, which is 9 feet high. It has filled up on my farm about 9 feet deep. My house has gone. You can just get into it by creeping into the highest story window I had a very pretty place that cost me $4,000, and I had to vacate it.

Q. Do you farm any of the lands?—A. It cannot be farmed now. It is of no value whatever now. If I was to offer it for sale to-day for one cent per acre no man would buy it. It is not worth anything.

Q. Describe the character of the land that the farming was principally carried on upon prior to 1862?—A. It was altogether bottom land; there was no red-land farming at that time. In 1853 that land was covered by water, but that was clean water and in six hours it went back and there was no damage done.

Q. The injury, so far as you know, is confined to what is known as the flood-plain lands or bottom lands, is it not?—A. Yes, sir. Since then it has extended out more and more, and filling up the flood plains will widen it in many places more than a mile on either hand. The rise of a foot will widen the surface about a mile back from the river.

Q. The slope, then, from the higher land to the flood plain is very gentle?—A. Yes, sir, when you get a few miles from the foot-hills; when you get near the foot-hills it is very steep.

Q. To what extent along the Bear and Yuba Rivers has the flood-plain been widened?—A. In some places it has widened a mile, and some other places more than a mile, and in others it is not very wide. My farm was within three or four farms of where the water debouched from the mountains.

Q. Take the Bear on both sides, from the foot-hills—the river to its mouth where it enters into the Feather River—how much has the flood plain been spread on either side there?—A. In many places the building of levees has stopped the spread of the water; then at other places it has widened out considerably. I should think on an average it is over half a mile wide on each side of the river. It would have been still further widened if it had not been confined by these large levees.

Q. Where these levees have been constructed the water depth has filled up against the levees, over the old flood plains to the present flood plains?—A. In some places it has filled up on an average 6 feet.

Q. On what side of Bear River are the levees?—A. On both sides, to some extent.

Q. How wide apart are these levees?—A. In some places 200, in other places 400 or 500 yards wide. The levees have not been built systematically, but wherever it suits them. These levees have been constructed by individual enterprise. I spent much money in building levees, but they have all been washed away.

Q. What is the character of this *debris*?—A. The greater part of it is gravel and sand, and wherever it has overflowed nothing will grow upon it. The silt or slicking goes on over into the Sacramento River when there is a rise in the water. It spreads over a greater surface the lower it goes, so that the slicking as the water commences to go slow commences to settle.

Q. Suppose that you could provide for the retention of the gravel and sand, to what extent would the slickings injure the country?—A. I think it will ruin it. I never raised anything on slickings in my life and never could, unless I put rich, black dirt over it.

Q. These flood-plain lands, which were originally farming lands, were not irrigated, were they?—A. No, sir. I commenced to make my farm in 1854, and in 1862 I had all the varieties of fruits, apples, cherries, pears, plums, apricots, and most everything a man could think of. I had all sorts and kinds of roses; I had yellow, red, green, and blue; and I had everything on it that a man could wish for to make it a home. I raised everything that I wanted; my principal crop was wheat and barley. I raised corn, potatoes, pease, beans, cucumbers, and all the other vegetables I wanted to use. I did not raise anything to sell but wheat and barley. I had some cattle on the hills back of my place.

Q. Are you as well acquainted with the valleys of the other rivers as you are with that of the Bear?—A. No, sir. I am acquainted with the Yuba River. In the early days when we lived right down here we used to ford it. We used to ford all our cattle just here at the Buckeye Mill, and I have seen the river when it was not more than 2 feet and pretty clear water. I have got on board a steamboat on the Feather River here many a day and gone right to San Francisco.

Q. Is this *débris* filling Feather River also?—A. Yes, sir.

Q. Does it overflow the banks of Feather River as it does the Bear River?—A. Yes, sir. I have seen the Feather River below the mouth where the Bear River enters into it, and they have built levees on both sides of it. Feather River sometimes rises 6 or 8 feet above the level of the land. I believe the government has expended some money to try and keep the Feather River navigable.

Q. Where would the water have spread to if the levees had not been built?—A. If the levees had not been built, it would be almost impossible to tell what would be the extent of the flood plains of the river now. I think all the country from the mouth of the Bear River, where it comes out of the mountains, clean to Sacramento City—hundreds of thousands of acres of land—if this thing continues will in less than ten years be destroyed.

Q. Where would that river now run if it was not for the levees?—A. It would probably be three miles out on the plain now if the levees had not been built. In one case, on the farm of Mr. Brewer, where the levees broke the water extended back more than a mile.

Q. Do the levees break frequently?—A. Almost every year.

Q. Do they increase the height of the levees?—A. They have, partially, on this side. They have built them regularly every year, and on the opposite side the water appears to come from the south, and breaks the bank in that direction. The right bank of the river, coming toward the mouth, is always the highest side of the river, because the river tends toward the south.

Q. What was the character of the stream for fish before this *debris* commenced coming down?—A. Well, sir, we used to catch wagon loads of salmon near my house. There was plenty of salmon there; now none can live in that water.

Q. Are there fish in any other river?—A. I don't know.

Q. Do the trout come down?—A. Not a great many; the water is too muddy. The salmon come up the Sacramento River in preference to coming up the muddy water. I remember very well I had a partner who had a fishing-boat; he afterward built a bridge, and the bridge washed away and the boat sunk. I remember telling my partner in 1862 that we would not live to see it, but I said I have got children who will live to see the day that the sand will be up to the ceiling of this house, and I have pretty nearly lived to see it myself. It only lacks 2 feet of being there now.

Q. How far from the mouth of the Bear River are you?—A. About ten miles.

Q. How far from the foot-hills to your farm?—A. Thirteen miles to the foot-hills.

Q. Does the silting increase in volume up the stream from you?—A. There is more up stream than there is down; it is higher up stream. At the mouth of the river, where it comes out of the mountains, it has filled up as much as 30 feet.

Q. How much has it filled up at its mouth below Bear River?—A. I cannot say. I have not been at the mouth of Bear River for many years.

Testimony of J. H. Keyes, Marysville, Cal

MARYSVILLE, *October* 28, 1879.

To the Public Land Commission:

My name is J. H. Keyes; I am a farmer and reside on the south side of Bear River, in Sutter County, State of California; I have resided at my present residence since 1856. I have observed the flow of mining *débris* since 1862, at which time it first made its appearance in the channels of Bear River, filling the lower sloughs with liquid mud, and since the year 1865 the flow has been continuous, and increasing from year to year until at this time it has filled all the old channel of Bear River and raised the bottom lands where they are not protected by levees to near the level of the plains, the deposit of *débris* varying from 3 inches to 15 feet in depth. I make this statement of facts as to the effects of the flow of mining *débris* over agricultural lands that your honorable Commission may not be led into errors by the theories that have been presented you by some of the statements that have been made to you: first, that our rivers were filling up from the washings from plowed lands; second, that the *débris* was a valuable fertilizer; and, third, that if it was doing any damage it was but small in comparison to the great interest of hydraulic mining.

I do not consider the first proposition as requiring any refutation at my hand; for if the working of farming lands produced this great amount of wash, all the river channels in the world would have been obliterated long before hydraulic mining was ever known. And I have never read of any rivers having their channels obliterated in the short time of ten years by washings from farming lands. It is a fact that all of our rivers run upon high ridges, with large bodies of tule land on each side, in which the wash of the greater portion of the farming lands would find a place of deposit, and consequently leave our rivers free from all filling from this source.

Second. That the mining *débris* possesses great fertilizing qualities. It is a fact that the soil of the mountains within the mining belt is composed of matter not deleterious to agricultural lands; but the proportion of this is as one in two or three hundred parts, while that which comes from a greater depth possesses none of the vegetable-producing qualities. Neither wheat, barley, nor any of the cereals grow with any success upon any lands covered with *débris* to a greater depth than the plow can reach. Corn grows plenty of stalks, but does not ear well. Potatoes grow but sparingly. It is not the case, as stated by one of the parties before your honorable Commission, that the best potatoes are raised upon the sediment land, and two crops in the year; but most of the potatoes raised on Bear River are raised on the original soil, where it is protected from the flow of mining *débris* by levees, 12 and 15 feet high. Nearly all the vegetables grown upon sediment land are of an inferior quality, and in no way has the *debris* benefited the farming lands that are now covered with it. On the contrary, the mining *debris* has permanently destroyed in the Bear River bottoms several thousand acres of the very best farming land in the State; and another effect of this covering of the bottom lands with *débris* is that there forms on the surface of the filling a white crust of alkaline substance, near which no vegetation grows.

Third. That the damage was small in areas and values as compared with the mining interest. This question must be considered in all its bearings upon the material prosperity of the State. It will not do to decide it upon the relative value of an acre of mining land and an acre of agricultural land. At this time, if the acre of mineral land contains fifty or one hundred thousand dollars, it is valueless when the mineral is extracted (if done by the hydraulic process), while the acre of agricultural land, with its continuous productions from year to year, so long as the product of the soil is required to support human life, is valuable beyond computation. Nor is the acreage small when taken upon all the streams that are like affected, which has been variously estimated at from three to eight townships of government survey. Nor is this but a small portion of the damage as compared to the obstructions of our navigable rivers and the filling up of the bays and harbors. The statement of one of the mining experts before your honorable Commission that the farmers contributed fifteen-sixteenths of the filling to the miners' one-sixteenth only requires one look at the streams (that are the outlet of the hydraulic mines) from the window of a passing train to convince one of the unreliability of this statement; and, from my observation, I should change the proportion to one part contributed by the farmers to ten thousand parts contributed by the miners. The covering up of the lands of the river has driven the people away. Where before this destruction commenced there were prosperous communities, school-houses and churches, to-day is a sand waste, unfenced and uninhabited, growing nothing but willows, with here and there a cottonwood.

This witness also states that great damage would be done if the mines should stop by reason of *debris* coming down.

If this theory is correct, then when the mines are exhausted we may expect a deluge of mining *débris*, or go on sending down the mountains indefinitely. I consider the damage done to the present time greatly underestimated. The filling done in the rivers and bays can only be determined by actual survey, which is now being done, and a report is to be made.

Hoping that you will get the true facts on the subject of your investigation,

I remain respectfully,

J. H. KEYES.

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* *Testimony of H. L. Knight, at San Francisco, Cal.*

On October 8 H. L. KNIGHT appeared before the Commission at San Francisco, as he stated, on behalf of the workingmen's party, and testified as follows:

Question. What class or party do you represent?—Answer. I was the first secretary of the workingmen's party when Mr. Kearney first came into existence, and when he became emperor and dictator I seceded. I do not now belong to what is equivocally called the workingmen's party. At the same time I still represent a large party who are interested in some reformatory measures, particularly in our land system.

Q. Do you recognize the classes of land based on the physical characteristics that we talked about this morning?—A. Yes. I have been in the State of California since 1862. I have repeatedly canvassed the State over and over and talked with farmers; I have seen the whole of it, and know it as I do San Francisco. I recognize the different classes—mineral, irrigable, timber, and pasturage land.

Q. What system would best secure the preservation of the timber and its utilization for the best industries of the country?—A. Let me say one more thing. Perhaps it will explain further my position. I have been in England, Ireland, Scotland, France, Germany, Italy, Spain, Mexico, and over most of the United States, and I am familiar with the United States land laws as they are. I have practiced some in the

land office as attorney in the State of California, and I come here representing those who are opposed to land monopolies in every shape, and I would desire to so manage the public domain as to prevent, as far as possible, the patrimony of the people falling into a few hands. Let me say to you that I am the farthest removed from the communistic fallacies of those who want to throw everything open and want to have the land in common. To make the land useful it must belong to somebody that will take care of it. The first thing to be done is to have something to distribute, and the next thing is to distribute it. As a general thing communism and all tendency to communism is not (*i. e.*, against) private ownership in lands, and tends to the protection of nothing. It proposes a wide distribution, but it utterly fails as a protective system. In our State, as a gentleman stated here this morning, our lands had been thrown open, and every man has destroyed the timber and turned his cattle upon the grass, and the result is that everywhere the oats and other wild stuff has all gone, and the cattle, in consequence of the dearth of grass, have in a great measure died, not having enough grass to eat—a dead loss to the State and country. My opinion is that the land of the State should, as soon as possible, be put in the care of private owners, but the general policy of the government should be, as quickly as is consistent with public interests, to dispose of the land in some way or other, and always to those who are actual settlers on it and improve it, no matter what the condition is.

Q. How can you do this?—A. First, you have observed, in relation to the irrigable land where one quarter section is competent to maintain one family, I think the old method is a good thing—that is, the homestead and pre-emption method; but there are lands in this State that are utterly debarred from settlement in this way, and my opinion is that the government might own them a hundred years and no man could take hold of them in that manner, because the land itself is not worth the government price by a long ways. Consequently no one-quarter section of this land will maintain a family or do anything toward it. These lands are of a different class. Take first the plains lands that require irrigation. In relation to that land I would make a rule that after being in the market a certain time, if no one takes any of it, no one wants it, and the government was well satisfied that without irrigation it is not available for settlement, and that individuals will not apply for it, this land should then immediately be offered in large tracts to companies, binding such companies as purchased it to expend money in irrigating it, and binding them to sell a given proportion of it to actual settlers within such a length of time.

There is the timber land. In this country some of it is very valuable, and some of it perhaps not worth $1.25 per acre. The timber lands should be appraised and offered for sale at once. Some of it will, perhaps, sell for $20 per acre. I do not know, but whatever the price might be the best interest of the State requires that it should all pass from the general government to private ownership, that it might be liable to taxation in the State and undergo some sort of improvement.

But let me here put in a sentence concerning another matter. There is a large quantity of land in the State that was granted to different persons for different purposes. Their right is perfect, and it would never be disturbed. I think the general government ought to pass a patent to these parties at once, so that their land might be amenable to State taxation. That would apply to the railroad lands and to other grants of lands. The State needs the revenue that could be derived from them. This timber land should be graded and offered for sale to anybody. These lands are valuable only for timber. There might be a yearly reduction of price—a greater reduction—say every five years, so that the lands not taken the first five years should during the next five years be offered at a lower price, and so on successively until the cost would be so low as to warrant the speedy taking up of them all.

There is another class of mixed lands in the foot-hills. Some of the land is valuable, here and there, in small patches. I have my eye on a great many little valleys in the mountains where, after having ridden twenty miles through a desert that is worth nothing, I have come upon a small creek, where there were a number of settlers with their families located in a straggling manner along the creek for ten miles. Such places as these are not worth surveying, and hardly worth the attention of the government. In the Alps in Europe there are lands similar to these. A man has gone on those lands, and at first the place he located on was not worth anything, but as years went on he made the land worth something. I think there is hardly a township in California but what has little isolated spots capable of the same thing. I believe that as to State lands throughout the State of California it would be better for the government to make an arrangement, either through its own surveyor or through the county surveyor, to let him award to any man who would go and make settlement on these little pieces of land just as great a quantity as he deemed necessary for the maintenance of a family. I would give such a man a liberal supply, and yet not make him a land monopolist. I think in some cases a square mile might do it, and in other cases four square miles, and in still others nine square miles. I am bold to say in some cases it would take a township to induce him to go there, and the government should give him a fee-simple title to it; I think it would be wise to do so—wiser than to let it

remain the property of the government, at the mercy of depredators; and if it is timber land, to have the timber taken off from it, and if it is flat land, to have all the grass grazed off of it. I am opposed to monopolies, and of the land I would be very sparing, but land like that I would give enough of it to any man who would go on it to induce him to establish himself there.

We have very large bodies of irrigable land in this State that are reasonably productive, providing water can be got to them, but water can't be brought there by any individual owning a quarter section, or one section, or even ten sections; it must be the work of large companies; therefore I would advise the government, wherever responsible companies apply for such a body of land, to make it over to them on condition that they would spend so much money, and that after so many years they should sell so many sections or quarter sections to actual settlers. I do not know of any other way of making them valuable.

Q. How would you dispose of the grazing lands?—A. I would dispose of them in the same manner as the waste desert land in the mountains and foot-hills. Every man who, by going into some land office or some other designated office and making oath that he wanted so much land in such a place, and that its quality was such that the amount specified by him was not more than was necessary for the maintenance of a family, should have it, or as much of it as would be necessary for that purpose, for $200; or allow him to homestead it. I would allow him to get title at once. I would limit the quantity in proportion to the quality of the land. If it required a county to support his family, I would give that. I would give it to some man who would take care of it and bring out what there was in it. At the same time I wish it to be distinctly understood that I am opposed to monopoly. Put the land in private ownership; I do not care what it is; call him a private owner if you please, but let him set to work to develop some value there, so as to bring taxes to the State and population to the country. Throwing these lands open to everybody only encourages trespass and depredations, and discourages all improvements.

There is one thing more I wanted to say. I suppose you know I am not in favor of the Chinaman. The Chinaman has been such a retarder of settlement in this State, keeping down its population, its wealth, and its prosperity, as no other one circumstance has done, besides impoverishing the land office in this way: There is a great ranch of 10,000 acres of land; I know of several in the State larger than that. You will find a great number of Chinamen employed on one of those ranches; all the solid work is done by Chinamen. The owner hires a few white men, but the solid work is done by Chinamen. The white men are taken on and discharged at different times, when there is a hurry in the work. On or in the neighborhood of this ranch there are little nooks or valleys along the water-courses, where, if that farm employed white men, these white men, steadily employed on that ranch, would discover these nooks in course of time and take them up and establish their families on them. They would buy the land and build cottages, because they could get work on the big ranch whenever they pleased and work their own places at odd times. In that way they would open up small farms, and in that way the country could be settled up, and with their wives and children they would soon make villages. But as it is now the ranchmen employ Chinamen, and these little nooks go to waste. I could find twenty thousand places of this kind that would make homes for white men, with their wives and children, if the men could find employment until they could get fairly settled upon it.

Q. What have you to say about the destruction of timber by fires?—A. Non-ownership of the public land induces depredations of every kind. I have lived in the mountains and on the open plains, and there is hardly a township in the State where I have not been, so that I am acquainted with the whole of it. The State wants private ownership to protect the timber. It is destroyed to a great extent by fires, and cut. It is hard to state which is the worst. Fire, when well started, does a good business; but the cutting is constant and perpetual. Men travel through the forest, cutting the finest timber they can find for the most paltry purposes. Private ownership would not permit that. I believe it should be sold at once. I believe in private ownership.

Testimony of R. F. Knox, San Francisco, Cal.

R. F. KNOX testified at San Francisco, October 11, 1879.

I have been considerably engaged in mining for a good many years up in the northern part of Napa County. The only thing that has occurred to me about the land in that section of country is concerning what is denominated third-class lands, or lands that are covered with chaparral, which also covers the mountains, although here and there you will find a little valley in which there is something growing; and it was in reference to this chaparral country that I think there might be improvements made in the manner of surveying them, so that some of the lands would get into the market

and be used. The chaparral grows on the coast range of mountains and into the interior through the whole mountains. The Saint Helena Mountains are 4,400 feet high, and these mountains probably range from 1,500 feet up to the height of the Saint Helena Mountains, and all of them are covered with chaparral and a growth of brush not amounting to timber. There are portions of that land that are wanted by the people; and, as the whole is not worth surveying, what I was going to suggest was this: that there can be an improvement in the matter of surveying that land by having the government make the survey in townships. Then anybody that wants that land can go to the county surveyor and find it for himself. If the United States sectionizes the land it has to be found by the county surveyor, because the stakes rot out and because the government only divides the land into 640-acre tracts. I believe this same system might be equally well extended to all classes of land. The government should only township it, and let the sectionizing and subdivision be made by the county surveyor. In this kind of country there are a great many townships that are not worth surveying, and never will unless some such system as this is adopted. I think there is considerable of that land that would be good fruit and vineyard lands, but it is not in demand at present. It seems to me that this system of surveying could be advantageously adopted in all the public lands. There are a great many townships right around here where the quicksilver mines have been surveyed; but, because of the hurry, the lands were not surveyed. It costs twice as much to township that land as it does open lands. No surveyor can run more than one-half the lines a day that he can in other countries. That difficulty may be overcome by triangulation to a considerable extent.

There is one other thing that occurred to me in reference to entering mineral claims, in regard to which I think the laws should be a little changed. It now requires that the advertising shall be done in the papers nearest the mines. In the first place, the advertising amounts to very little; and, in the next place, the newspapers where you are *obliged* to insert an advertisement will charge you twice or three times as much for it as if it were optional to advertise in that paper, and I think the newspapers ought to be compelled to charge commercial rates, unless you are allowed to advertise in any paper you please, so that there will be competition. I think, also, that the attorney in fact ought to have the right to do all his client's business after the application has been made by the claimant. The whole matter, as I regard it, should rest with the district land office, and the county recorder could then be made a deputy of the district land office. I will also favor the trying of all contests in the district land office, and will suggest that the district land office should have a seal. I think it is important that they should have the power to perpetuate testimony and subpœna witnesses.

In reference to homesteads, they are very popular in this country, and it is very popular, too, in some people, to vote away other people's money and other people's land, and it is a question in my own mind whether anybody has a right to vote away property that belongs to me and other people. I do not believe that the homestead is right. I think there are ways by which the government may control speculation in property by putting a higher price on its lands. The land should be got into the hands of actual settlers and cultivation as soon as possible, and it is bad that the lands are allowed to be bought up in large tracts. Now, if the government should put a higher price and give a liberal time for payment at a slight interest, I think it would stop speculation and give the land to the producers. I would do away with homesteads, but I would not abolish pre-emptions. I think it would be but just to allow a company, by its officers, to enter as much timber land as an individual could enter. The mining corporations must have wood, especially in quicksilver mining; if they cannot buy the land from the government they will steal the timber. If a man goes to enter a piece of land for the benefit of a friend, he then goes in and makes oath that he is doing it for his own benefit. The law in this respect is evaded by a man swearing with a very loose conscience, in order to get hold of land that he would not be entitled to under the law.

Q. What system of disposing of the timber land would preserve the timber and be beneficial to the interests of the country?—A. My idea is embraced in the general remark I made a few minutes ago, that the sooner these lands are in the hands of any person who will pay taxes on them the sooner the timber will be preserved. The only question is, not to get these lands into the hands of large speculators. I believe right there comes in the question of how you shall put the price, so that it will not pay to speculate in the timber lands, but at the same time such a price as will enable a man to invest in the timber for manufacturing purposes. I do not think $5 per acre will be too much. I would sell the land in quantities to suit purchasers. I would not sell it for $1.25 per acre; it will be gobbled up by speculators if you do.

Q. How would you dispose of the irrigable lands?—A. In general I would dispose of them in the same way. I would have graded prices for the different classes of land. I would not sell the third-rate land for as much as the first-rate land. I would grade the land by the government surveyor when he surveyed it, and sell it according to the grade he gave it.

Q. How would you dispose of the pasturage lands?—A. For the pasturage lands I would recommend the same disposal. Allow a man to buy as much as he wants, after putting a proper price upon it. There would be danger that they would take up all the water; I do not know just how to prevent that, for sometimes taking up the water enables a man to hold adjacent land.

Q. Would you allow prospectors to prospect on the placer lands?—A. If a man has a right to enter a large tract of land up in the mining section that might be desirable; but in this coast range there is no mining, and in regulating the matter by general law you must grade them, because this is a thing which the miners would see at once, and of which they would be exceedingly jealous. It might work badly in the mining section of the country to allow anybody to go and enter 640 acres of land for grazing purposes, although that would be too small an amount for that purpose. Why not have a system by which anybody could enter and buy the land, and buy the surface right to the ground, leaving out the lodes which might be under the surface? The privilege of mining could then be sold separately. I would divide the two rights. The man who buys the land for grazing purposes ought not to keep out a man who wants to dig in the earth for what is in the land and is more valuable a thousand times.

Q. Have you had much experience in mining?—A. I have had considerable experience in regard to quicksilver near Knoxville. The Knox and Redding mines have been more successful than any other mines of that character. It is a fact that in quicksilver deposits there is no such thing as a lode; there are seams, found generally in the serpentine. They sometimes lie down, and sometimes stand up. The Alamadan deposits, so far as I have observed the seams that have been worked out, have been between 200 and 300 feet long by perhaps 150 feet perpendicular and 60 or 70 feet wide, being smaller at the top than at the bottom. So far as my observation goes most of the quicksilver deposits are in that shape. I am under the impression that it is infiltration that has made it. I do not think the lode law applies to the quicksilver. I would suggest that the laws be amended in regard to the quicksilver mines, and that the area should be vastly enlarged. The law is evaded now, to some extent, in this way: a large number of men join and thus get enough land to make a mine; for instance, three men will form a company to work a mine as a whole. I think it a more desirable way to sell the quicksilver tracts in 40 acres, as in placer claims. The quicksilver district is very large, and so far as it is developed at present will commence with Lake County on the north and will extend into Sonoma, Napa, Yomo, and Calusa. I do not think there is any in Marion, but in Sutter there are valuable mines, and in Fresnal and San Luis Obispo there are mines. These counties produce nearly all the quicksilver in the State. There is some little quicksilver mining in El Dorado County. At present I think the production is about 400 flasks, running about 70½ pounds to the flask. If the quicksilver was sold for 60 cents, so that all the mines could be running, I think there might be 75,000 flasks taken out a year. It is so low now that a great many of the mines have shut down and some of them are bankrupt; but in case of failure of these mines quicksilver would go up very rapidly. The supply might be increased very much more if there was any demand for it. The price, in my opinion, should not be less than $5 an acre for the quicksilver lands. I do not believe in selling the land at $1.25 per acre. I think they should be graded before they are sold. Placer lands should be sold for $5 per acre; if it is not worth that it is not worth anything as a mine. The lowest I have ever known quicksilver to be was this summer; it reached the price of 33 cents; I have known it to be $1.55 per pound. You will generally find the quicksilver in the dirt. There is no apex to a lode. You will find it sometimes when there is a wash.

In addition to the above statement, Mr. Knox submitted the following letter:

SAN FRANCISCO, *October* 11, 1879.

DEAR SIR: In addition to what I said this morning on the land question and survey, &c., would add that of the survey in townships I would have township plats drawn as at present, except that the sections and subdivisions would be full as if the survey was perfectly accurate and sell 640, 320, 160, 80, or 40 acre tracts. The county surveyor would give the earlier locations full acres, and if the last entries were an acre or two over or short the improvements in the surroundings made by the first locators would more than compensate for the difference.

To grade the quality of land and sell at a price reasonable to settlers, and yet high enough to keep speculators from gobbling it, is the happy medium to be reached. By this system some land would quite likely be graded too high, and to correct this possibility I would after land had been in market five years remaining unsold reduce the price—say 20 to 25 per cent.—after ten years another like reduction, and after fifteen and after twenty years until it was reduced to 25 cents.

By giving purchasers time to pay at a small rate of interest they will not be oppressed, and speculation shut out and government get twice as much as now for the land, and everybody get a piece of land that wants it. If you and the author of the

homestead law heard men *curse* the government as I have while they were living on the land government gave them without consideration, I think you would say with me the homestead law should be repealed. The freedom with which some people vote away other people's property is astonishing and I find no parallel to it so to the point as the story of the "unjust steward," which you may have read—his sagacity was commended, but not his high-toned honesty.

Respectfully,

R. F. KNOX.

Hon. THOMAS DONALDSON.

Testimony of William J. Lewis, of San Francisco, Cal.

WILLIAM J. LEWIS, civil engineer, resident in San Francisco, testified October 15, 1879, as follows:

I have lived in the State since June, 1849. I was a United States surveyor for some time, and have had considerable connection with the department since the establishment of the land office in this State, and I made some surveys before the land office was established. My first surveys were made in 1850.

Question. What disposition should the government make of the timber land?—Answer. I think that it would be difficult to make a general law. A law that would apply to the southern portion would not apply to the middle part of the State. To the north of this there is a very dense timber land. When you go further south it is much more limited. I think south of this I would sell the land absolutely in tracts of, say, 160 to 320 acres. Take Santa Clara and Santa Cruz for instance: a great deal of redwood there has been cut off, and all persons who hold tracts of 160 acres can cultivate the land, because the soil is fertile and the ground is very valuable for agricultural purposes. Right on the very summit of the Santa Cruz Mountains, and between San José and Vera Cruz, they make the best wine in California, at an elevation of from 1,400 to 1,700 feet; and where the sides of the mountains are cleared off the land is very good. A considerable portion of it is now under cultivation.

Q. What do you think of the timber upon the high Sierras?—A. The question is, is this timber at present accessible to market or likely to become accessible.

Q. How can the timber be best preserved and utilized by the people?—A. It appears to me that it would be safer to reduce it to private ownership, or have government officers take charge of and protect it. I do not know which would be the best, but I think one or the other ought to be done. It certainly ought to be preserved. In reducing it to private ownership you guard against this destruction, and I think I would sell it gradually, but not too much at once, or perhaps limit it to 640 or 1,280 acres to one purchaser. I do not see the policy of reserving alternate sections. It is very important that the timber should be taken care of, because if you allow it to be destroyed on these mountains you will undoubtedly change the climate very materially. A great deal of care ought to be taken of the timber, and therefore I would not part with it loosely. I would sell it as the requirements of the country demanded, and no faster.

Q. You know what we call irrigable land. What disposition would you make of that land?—A. I think I would sell it absolutely, and not in very limited quantities.

Q. Why is that necessary; why not allow a man to homestead it?—A. If men homestead it they might be able to combine together and irrigate the land afterwards. It will require, in order to carry on a general system of irrigation, that there should be a large amount of capital invested; but if these lands are homesteaded and the water secured or held by the government, then you might leave open these lands and the settlers could unite together in forming companies of citizens. That would be better than giving any corporation of men a large monopoly of land, which is one of the greatest valuables in the State.

Q. You recognize the pasturage lands. What disposition would you make of them?—A. I think I would sell them in tracts to be governed by the quality of the pasturage, because in some parts of the State two sections will be sufficient, while in the southern part, where the grass is much inferior, probably four sections might have to be sold together. It would depend upon the quality of the grass entirely. Let the surveyor report upon the character of the land and grass, and from that report determine whether they should be sold in smaller or larger quantities; but hardly less than two sections would be sufficient under any circumstances. In the southern part of the State I think four sections would hardly be sufficient.

Q. How would water rights be managed in this case?—A. I have not given that subject sufficient consideration to be able to give an intelligent opinion, although I am favorably impressed with the idea that the government should hold the water and make small tracts on the water-courses national reserves. I know that parties

now take up springs and can thereby control many more acres of land than they own. There was one man that had a grant that really covered four leagues, but by the decision of the commissioners they only gave him two. The grant was described as two leagues in length and two leagues in width, and the Mexican Government gave him a title, describing it as two leagues in length and two leagues in width and containing two square leagues. The Commissioner confirmed the two square leagues and no more. I spoke to the owner of the grant, asking him to appeal from that decision; but he said, I have the springs and I have the water; I do not want the other land; I would not pay taxes on it.

My chief object in coming before the Commission was in regard to the system of public surveys. Now, there are certain prices paid per mile which are grossly insufficient if the surveyor should do his duty, and he is now prohibited from receiving compensation from the settlers. He cannot possibly make a proper survey at the price set down. On all but plains land the price is $6 per mile, that is, where it is heavily timbered and mountainous. You go among the mountains, where the land is difficult to survey; you come down to that price of $6, and even at $10 per mile on heavily timbered land it will not pay if the work has been done properly. The price ought to be raised at least 50 per cent., and the surveys would not be desirable at that. Then, in addition to that, there are extra duties imposed upon the surveyors that are not required by law, and a good many of them it is impossible to perform. The surveyor is out on the ground, and he cannot make expenses now. There is not a single deputy surveyor who has made anything the past ten years. I am satisfied that they have not made an average salary of $100 per month, and most of the best deputies will not have anything to do with the work. In that way the old citizens are completely driven out and will not have anything to do with the surveys. It is not enough to do what is originally required, but extra duty must be imposed upon them. Among other things the deputy must take care to report all depredations upon the timber and the names of depredators. On page 6 of "Special Instructions to United States Deputy Surveyors," by the surveyor-general of California, the following instructions are given: "Your special attention is called to the extension of the lines of public surveys from south to north, as required by the manual of surveying instructions. No deviation will be allowed, and you are hereby notified that a non-compliance therewith will cause a rejection of your work. Depredations on timber growing on public lands having been carried on by parties in violation of law, and Congress having provided the necessary measures for putting a stop to future unlawful destruction of valuable timber on public lands, in obedience to directions from the honorable Commissioner of the General Land Office, you are instructed to report any depredations of the kind which may come to your knowledge, from personal observation or derived from reliable sources. The information should state particular localities where trespass is being or has been committed; the names of parties implicated, and the extent of the depredation committed. Each deputy executing contracts for the survey of public lands will be required to return with his field-notes a special statement, under oath, that he has correctly reported all depredations upon timber growing upon public lands which have come to his knowledge, either from personal observation or from reliable sources, and that he has used due diligence to ascertain the names and present residence of the parties who cut or procured said timber to be cut or carted away, or manufactured the same into lumber. Any failure to comply with this requirement will result in withholding approval of the work and of the account of the deputy therefor. Deputy surveyors are required to give these special instructions their careful attention, and to execute their surveys in strict conformity therewith, and they are reminded that by the provisions of section 2399 of the Revised Statutes these special instructions are made a part of their respective contracts." Now, how can he do that?

Again, on page 4 of "Special Instructions" it is stated that, "Desert lands are defined by this office to be lands which will not, without irrigation, produce any agricultural crops, and which may be reclaimed by irrigation, and for which there is sufficient water available. In classing lands under these various heads, the deputy will state precisely what are the productions of the soil, both natural and by means of cultivation." And, further on, "If the land produces any species of plant naturally during either the whole or portions of the year, the fact should be stated." He is only there part of the year, how can he tell that? These instructions go on to say: "Deputies will also ascertain as nearly as practicable the approximate amount of rainfall, and how distributed during the season; the usual time of the year when different crops are planted and matured, which are usually raised in the particular locality"; and also, "Deputy surveyors are prohibited from giving information to any person regarding surveys made by them, and are prohibited from charging or receiving moneys or valuables from settlers or others for work included in their contracts." That is to say, that when we establish corners we must not let persons know that the corners are established. I supposed, on the contrary, that deputy surveyors ought to give all the information possible in regard to the surveys and the corners established by them. Then, there is another thing: when we establish corners we have marks on the stakes

which indicate precisely what the section or quarter section is, and it is very important that those living in the vicinity should know where those corners are. If a man knows where his corners are, he is interested in protecting them. If there are fires, the people will rush out and protect these corners.

Q. Give your observation in regard to the permanency of stakes, marks, &c.—A. Many of those surveys were made twenty years ago, and in surveys that I have made nobody knew where the corners were. I had to start north of Sacramento City and cut my way south two miles, and then could only make my survey by means of bearing-trees. The bearing-trees are more important than the stakes. Oak stakes decay in six or seven years, redwood stakes will remain for twenty years. Redwood is almost imperishable; it has been known to last in the mission buildings for eighty years.

Q. What would you suggest concerning permanent stakes?—A. Stakes and mounds are now used; but then you have bearing-trees, which are the most important points. Where you come to the plains, where mounds are erected—Mr. Day, I think it was, testified to the cattle pawing them down. He would go on, and by the time he got a few miles away he found that the cattle had torn away those mounds, and thus they destroyed the marks of the survey. As fast as he could put the mounds up the cattle destroyed them. It ought to be done entirely differently, and the government ought to pay for it. This letting it out by contract is pernicious. It can't be done in a proper way, because the more miles a contractor runs over the more pay he gets. There should be a corps of surveyors selected in regard to qualifications, and not influenced by politics at all. But as long as we have a contract system, whether we raise the price or not, the work will not be faithfully done. There is no question about that. When good prices were paid twenty years ago it did not result in good work being done. I got a survey more than twenty years ago for a grant, and I had to connect with the government lines. I found the lines, and they had run the government lines until they were within six miles of the United States meridian. The surveyor had then reported that it was impracticable to make the connection, but there was no obstacle in the way. I could go easily the whole six miles, and I connected with the United States meridian, but that township was thrown out; yet the surveyor got his pay for it. This survey was one mile out of the way. In going thirty miles in the Santa Clara Valley they had got absolutely one mile out of the way. Up in Tahama County I made a survey of a Spanish grant, and I tried to connect it, but there was an error of more than a quarter of a mile in one of the townships surveyed. The line run through the timber for a considerable distance, but there was not a word about timber in the field-notes. There was not a bearing tree in the whole line. This was in former times, but your testimony will show that there was township after township where they really surveyed a little only and reported notes for the whole township. There was fraud after fraud, and you will find the evidence in Washington.

Unless you go into the country and see it, how do you know that they have been surveyed at all? If the deputy surveyors do not inform anybody where the stakes are or anything about it, some one would come and say you hadn't made the survey at all because they hadn't seen the evidence of it. That is very natural, and yet we are prohibited from letting him know anything about it.

I think the remedy for this is to have a corps of regular salaried surveyors; and it will never be done otherwise than by having a system of salaries. Let permanent monuments be placed; and in regard to the character of survey, instead of restricting them to one particular mode, let them do it by triangulation or any other way that is the best, and let that be decided by the judgment of the surveyor, who should be a competent man, and who should understand his business; and let his superiors be men of superior qualifications. I think this ought to be insisted upon; and, above all, you can't have your work done right at the present prices.

I desire to add just one more word, and that is, I have heard Mr. Redding's statements concerning *débris*, and I fully concur in them.

Testimony of Jerome Madden, agent Southern Pacific Railroad Company at Sacramento, Cal.

JEROME MADDEN, land agent of the Southern Pacific Railroad Company, testified at San Francisco, Cal., October 10, 1879, as follows:

Question. Do you recognize the classification of the land I have mentioned? If so, what system of disposition would be the best for the interests of the country and the actual settlers?—Answer. The arable lands are all right. The present system of disposing of them is, in my opinion, the correct one, except that there are some minor disadvantages in the way of delay in the land office. I believe the general system of the United States is adapted to the disposition of its lands, and is a very good one,

apart from this delay which I have mentioned, and I think it should be kept up. There is one further exception to this: I have lived in this country a long time—thirty years—and I have had a great deal of experience in land matters, and I find that it is one of the weaknesses of human nature that a man will take a false oath quicker about a piece of land than anything else I know of. Some men, who are good men and good citizens, won't hesitate to take a false oath about a piece of land when it adjoins their farm. It must be one of the weaknesses of human nature.

Q. If the government should classify the lands would that avoid the difficulties?—A. Not altogether. That would be a most excellent thing to do. The government should classify these lands as individuals do; but I had reference more particularly to the application of a man. I think that ought to be inquired into; whether it is *bona fide* or not. I do not wish to throw any impediment in the way of a man's obtaining title to the land. No honest man has anything to fear. I would inquire into his purpose in getting the land, but I think the classification would be a most excellent thing, and I think it would help the government to sell the lands. I think the government could charge a better price for the good land, and for the poorer classes of land it should charge a less price, so it would end in the same thing. I think after a man gets a patent for his land he should have it clear, out and out, from the surface to the center of the earth, with everything that it contains. This is the result of observation and a good deal of experience, and I am confident this is the best method. He either is or he is not entitled to the land, and I would give him a clear title to it or none at all.

Q. How would you regulate the disposal of the timber lands?—A. The timber lands should be talked about a great deal. After thirty years' residence in California, after having heard a great deal about timber countries, I do not think that I ever read of such deplorable waste. Such a deplorable, foolish, profitless waste of timber as there has been in California has never before been known in the world. Every person has had an opportunity to get in and slash down timber right and left. There does not seem to have been any care taken of it by the government at all; on the contrary, they have looked on with apathy. Every person thinks he has a right to come in and cut down, for a whim, the finest sugar-pine that can be found in the mountains. I have seen them do it to try an ax or to get out 4 feet of a butt. I have seen them cut down a magnificent tree, 300 feet high, and leave it to waste there and dry and rot to feed the forest fires. If you remonstrate with them about it, in some instances it will be as much as your life is worth. Miners and other persons have cut it down for purposes they thought it was needed for, when it was not needed at all. Men come in and strip off the bark and leave the tree to die; men come in and tap the trees for the turpentine, and after ten or twelve tappings the trees are fit for nothing. They do it for a small compensation, at a terrible loss to the government, and there has been a deplorable, not to say a criminal, neglect on the part of the government and this State in this matter.

Sometimes, when reflecting on this, I have thought of the stripping of the country the watershed of which flows into the Mediterranean Sea—the barbarous States of Morocco, Algeria, Tunis, and Tripoli, and along there, which lie in the same latitude as California—I remember reading of old times, in the histories of the Carthagenians and Romans, that these places were covered with timber, and supported a very large population, five times more than at present, and this alteration was in consequence of and resulted from the destruction of the timber. They destroyed it, so that now it is a barren waste, supporting only one-fifth of the number of persons that it formerly did, and they only find a scanty living where formerly five times their number could get a living.

I was thinking that California, a most excellent country, with its gold and silver and quicksilver, wheat, wine, oils, fruits, and grapes of every description, I think it is worth saving; that all of us here will pass away in a very short time, but our children will live after us, and if things go on as they are at present we will have the same condition of affairs as those persons of whom I spoke have at the present time. Instead of having trees which will protect the moisture and retain it they will have a dry, sterile country, which, instead of being a large and prosperous State, will be but an insignificant one. I would get men to preserve this timber; I think it is worth it, and I think that the getting of foresters or protectors for it is one of the factors in its preservation. It is true, apparently, that the timber costs but little at this present time; but the hiring of men to protect it is money well spent in a small way to save a large amount. Even if it costs a large amount I would consider that the expenditure of the money would be the greatest economy in the end. I would have this timber all surveyed, so that a person who wanted the timber land could have it in reasonable quantities for legitimate purposes. I would try to do the best I could for the people who reside here. I should be in favor of giving every person a piece of timber land to get wood and timber, within reasonable bounds, for legitimate uses; and I would prevent anything like waste or destruction. I would make laws very stringent if I could, and I would make it obligatory upon persons who destroy timber to replace it

in some way. Over on the Sierra Nevada they have a western slope about 65 miles—that is to say, the Sierra Nevada Mountains are practically 450 miles long, and at the base, beginning at an altitude of 300 feet, across to the base of the Sierra Nevadas, it would be 70 miles wide to the other side, where it goes into the other basin. The largest portion of the timber is there. I would see that the young trees are protected and that others are planted. I think in that way you will keep a prosperous State. I think that timber land should be held by private persons unless they are properly protected by the government. That would be the best way to protect them. If I wanted to go into the lumber business I think I ought to have enough timber land, so that it would be an object to expend necessary capital. One hundred and sixty acres or three hundred and twenty acres would be no use; it would depend, however, upon the thickness of the timber.

Q. Why is the expense necessary for timber enterprises so great?—A. In the first place labor here is very high, and in the next place machinery costs a great deal; then there is the investment in the timber land, and, taken with the teams and everything else which will be necessary for the proper outfit, it amounts to a very considerable sum, and no poor man can go into it. In the Eastern States a man puts up a saw-mill, where labor is cheap, and where you can have plenty of coal, and all that sort of thing quite cheaply; but you cannot put up a saw-mill at an insignificant expense out here. In the East the timber lands, or a great many of them, are accessible. You do not have to go into the mountains for them. Here you have timber lands on the sides of the mountains, and you have to go to a great deal of trouble to get out the timber. In the East, in Canada and New York State, they cut it in the winter time and float it down the streams, but you cannot do that here. The profits derived from cutting and manufacturing the timber upon 320 acres of land would not generally be of any use; it would depend, however, upon the character of the timber and the character of the country. The timber on the high mountains must be cut down, and it requires a vast expense to do it. Timber is sometimes floated fifty or sixty miles in flumes. The quantity of timber land which will be necessary for a mill would differ in different localities. In one place it might be necessary to have a large quantity of land, while in another place a small quantity of land would be sufficient. No man will go in and locate a saw-mill on 640 acres of land if the timber is standing thin; but if it is standing thick he might be induced to do it. This question of topography controls him to some extent. I would survey the timber tracts on the mountains with regard to the topography; that is, to the quantity of timber to the acre. I would have a sort of elastic system. Around a mining camp the trees are all cut down; there is no regard for them; there is nothing in the way of protection. People in California have got an idea that there is no ownership to the timber lands, and when a man takes up a mine he takes the finest timber upon it, without any return at all, and keeps what we call a shot-gun possession of it. If a man goes to jump his claim he will run him off; so that I think as soon as a mining camp is located the best thing for the United States to do would be to sell the timber immediately, because if this is not done it will be taken any way. There is some destruction of timber by goats and sheep. There is a great quantity of Angora goats on the foot-hills, and they destroy the young trees that are coming up. I am not very much acquainted with this, personally, but I am told so.

Q. Would any protection for the timber be sanctioned by the people in the courts?—A. As it is at present, I do not think it would. It would be an impossibility to convict a man in California of any crime in connection with cutting the timber. It will be best to have convenient facilities for purchasing. If you go to interfere, they say: this land does not belong to you; it belongs to the United States, and if you inform on me, and take me before the United States commissioner, there will be nothing done in the matter.

The more you create ownership interests in timber, the more you create a sentiment in favor of protecting it. Until you create a sentiment, it is almost impossible to affect the amount of depredation upon the timber. I know regions where there was beautiful nut-pine, and now there is not a tree there. The reduction of the timber lands into private ownership would be the readiest method of producing a sentiment in favor of protecting the timber.

I think the United States and the State of California should encourage the replacing of these forests. Every man will protect his own interests, and he will be very careful, for instance, that I should not cut down his trees without paying him for them. If a man has an interest in the soil, he will see that pine trees are growing there, and he will protect them. I do not think that the owner will cut the timber, and even if he did destroy it, he would be doing it by right and not in violation of law. If in the hands of private owners it would bring in a revenue to the government or the State, and it would stop the lawless destruction of timber by non-owners.

Q. How would you dispose of the irrigable land?—A. There are, in California, vast tracts of land that are not arable. Some lie in the extreme northern part of the State, in the Klamath Basin, and some lie about Honey Lake, and in that California district, and some lie in the central valley of California south of Stockton, and away on down

to the San Joaquin and Tulare Valleys. Some also are in the Mojave Desert and in the Colorado Desert. I think there is ample means of irrigating all this land under a wise and judicious system of irrigation.

I called attention awhile ago to the question of the watershed of the Sierra Nevadas, and also to the fact that the watershed slopes for some sixty-five miles to the west, taking almost all the moisture that comes from the Pacific Ocean. I think that the water and land should go together if possible. I think that every man, if he could, should have his own ditch for irrigation; but as that seems to be impossible and impracticable in a great many instances, I think that the federal government in conjunction with the State, or the State in conjunction with the federal government, should devise, under scientific management, a system that would answer the wants of the present population; and that system of irrigation, by a series of reservoirs in the mountains and that sort of thing which can be easily done, should be taken so much care of at the commencement that the future interests of population as it increased would only require the enlargement of this commencement. Then I think that anybody who wanted a certain tract of land should have not only the right but the inalienable right to his proportion of water. I think that a stringent law should be passed in regard to the distribution and administration of this thing, and that there should be no chance for discrimination or anything of that kind. Everybody should have a free, equal, and just chance. I think that the State (or the United States) should fix the tariff on the water; but if the United States or the State of California did not wish to do anything of that kind, or will not do it (though if they can encourage it it will be a most excellent thing), then, if neither of them will do it, I think that the aid of private enterprise should be called in, and the person investing his money in irrigation works should be controlled by the laws of the State, and a person should be appointed by the State, with assistants to be appointed by him, who should have charge of the distribution of the water, and the management and distribution of it should be taken out of the hands of the owner of the irrigation work; so that in seasons of drought and short supplies of water the owner might get rid of the arduous task of discriminating between individuals.

In regard to the farmers, a great deal has been said about associations of capital and labor, &c. I notice that because it was done in the mines in the early days it is now said that it could be done also by combinations of agriculturists. I think the person advancing that proposition is mistaken. In the Sacramento Valley there is about 30,000 square miles of level land, and there are 450 miles of water-shed by 60 miles wide, and there is certainly enough water in that space to irrigate to the hills east of the Sacramento River. It may be a question whether the streams of the coast range will irrigate the western side. I think if a certain tract of country which would be controlled by a certain stream should be laid off into a class by the government as "irrigable land," it would be a good idea for the government or the State to take charge of the distribution of the water and pass stringent laws for the administration and distribution of it. It would be a policy that would work well. In that case I think a smaller amount of land would do for a homestead than is given under the present system.

As location is practiced in the State at the present time it seems to me in a measure inoperative. I will illustrate it in this way: If my farm is on a stream and I make an appropriation of the water for the purpose of irrigating this farm, and another gentleman wishes to locate a larger tract above me and wishes to take out all the water in the stream, he thus utilizing all the water of the stream, I, who made my location in a bad place, by my obstinacy and selfishness spoil all the effect of this latter location, and because I won't yield the water the whole thing goes to waste; whereas if it was taken out on a proper place all the land on the river could be utilized; and so I think that the farmers or association of farmers cannot do this thing. There will be contention all the time and personal difficulties. There are large valleys in the Sierra Nevada Mountains that are not now fit for anything at all, where, by appropriate engineering, there could be water enough stored in one year to irrigate the whole district. And it will have this further effect, too, upon the floods and dry years in California: In the years of floods all these men who have swamp land are flooded out; in the dry years persons who own the uplands are starved out. Now, by making a system of reservoirs, where these waters could be collected and stopped, it would prevent disastrous floods upon the swamp lands, giving the dry land sufficient water at all times. This thing could commence now, to meet the wants of the comparatively few who are upon that character of land, and as time advances and population increases here these things could be enlarged. It would take probably fifty years, may be a hundred years, to complete them. This is done in Spain, and the production has increased twenty-fold.

Q. Will any difficulties be encountered by reason of vested rights in the spots where the water should be stored?—A. Yes, sir; there are vested rights. The water has been monopolized, and it has been truly said that water is the basis of the wealth of

California. The water is all being taken up; irrigation works, as a general thing, are not very productive to the individual who invests in them.

Professor Davidson estimated some years ago that it would cost five or ten dollars per acre to irrigate the Tulare Valley. I think I heard Mr. Haggin say that it costs a million and a half of dollars to bring in the water in his locality. I think he has redeemed something like 300,000 acres. Then there is, in addition to that, the cost of the land. It costs about five to ten dollars per acre for canals and distributing ditches.

The Congress of the United States passed an act, called the "desert land act," which was intended to reclaim some of this desert land; but in the way in which it is worded it seems it is inoperative. I think it could, measurably, have accomplished the purpose intended under a liberal interpretation of the law, but in the way in which it is administered it does not amount to anything at all. In those places which I have described, and on which there is no water, under this act you have a right to take up 640 acres of land—in Tulare Valley, say. The land is good enough if you can get water there. There are two methods of getting the water: one by bringing it from the mountains, the other by sinking artesian wells. You are called upon to pay 25 cents per acre in order to be permitted to file on the land. Then you have got to go off twenty-five miles to have the water brought on the land. Then, possibly, you have to buy out the water rights of those who have appropriated the water, and go to the expense of building ditches, &c. Now, taking into consideration the evaporation of the canals, you have got to have a pretty large head of water before you can use any of it on your 640 acres. Thus you get 640 acres that cost something like eight or ten or twenty dollars, or perhaps fifty dollars, more than the land is worth. But it does not end there: the Commissioner of the General Land Office in his instructions to registers and receivers says if I pay 25 cents that the rights I have acquired in the land are not assignable; therefore there can never be any association of capital.

The Land Office in Washington thus goes to work and throws an impediment in your way by saying it is not desert land at all, and you shall not have it until you have proved it to be such. You have to get two men to go to the register and receiver and swear that it is desert land and that you cannot raise crops on it without irrigation. Then the register and receiver may have some objections, and you do not get your title. Then the government may come along and say it is not desert land, and you will have a contest; and, finally, another man may come in and take the land under the homestead or pre-emption act. You say to the government, take back the land and give me my money. The government officers say, "You have paid in your money, and you cannot have it back." Generally the fact that the land is irrigated should be sufficient to prove that it is desert land and requires irrigation. I believe that the really irrigable land should be sold in tracts of 40, 80, or 160 acres, at such a price as might be deemed best, and I think the certainty of water should go with the land, in proportion to the amount of land that is sold.

If the government should go into the irrigation business itself, it would be better. I think the State or federal government should have control of the water. If it goes into the hands of private individuals, I think the government should still retain control of it, so that there will be no unjust distribution of the water. If the government does not take control of it, it may be well to sell it in such tracts as persons might desire, compelling them, after the water was taken out, to sell the land to parties desiring to purchase. If the government could not do it, then it would be a better way to get it into the hands of private individuals, allowing them to reclaim it, and then compel the companies or individuals to sell it in small quantities to satisfy settlers; but I think there should also be stringent laws about keeping the control and distribution of the water in the hands of the government. I think the water ought to inhere in the land. I should want it so fixed that there could be no injustice done in the matter of water.

Q. So large a portion of the people are opposed to making it a subject for internal improvement, and it not being the genius of this country to favor such a system, and the State not caring to enter into any such enterprise, and it being desirable upon the part of the government that the country should be settled up and occupied and these lands sold, by what system would you induce capitalists to invest $150,000 to put in dams and take out the water, so that the greatest good should be done, and they feel safe in their investment?—A. I would allow the people to go and select these lands and take them at private entry, and give them a full and square title at once. There are lands in the Tulare Valley that have been surveyed for twenty years, and are still unoccupied. You can go forty miles and not see an inhabitant. No one wants to go in and reclaim that, and it is absolutely useless as it is. I would make it worth while for capitalists to take hold of that land and reclaim the remaining portion of it. Yet in doing that it should be so arranged that they should be compelled to sell the land to actual settlers after the water had been taken out of the rivers and put upon it. These lands are like squares on a checker-board; no man wishes to go in and reclaim any land in that condition; it would not be worth his while, for in reclaiming his own land he

would be reclaiming the land of other people. I should so fix it that he could get all his land together. There is no danger of this land remaining in large tracts in the hands of corporations or associations. The corporations would find their greatest profit in dividing the lands up and selling them. With water on these lands and the lands made irrigable, the value would be raised so high and the taxation would be so excessive that they could not afford to hold them; and, in the next place, if a man had money enough to hold them for any length of time, after he was gone the land would be subdivided. If persons went into this business, they would do so for the purpose of making money, and that money could best be made by selling the land. A man can profitably work by his own labor but ten acres of land, if it is not in grain. If it was in anything else, say in fruit, he could not work 10 acres. No individual could work 160 acres.

Q. What have you to say about the pasturage lands?—A. I concur fully with the testimony of Mr. Boggs. I think the pasturage lands should be surveyed with reference to the water.

In the State of California, there has been a great deal of injustice done to the people at large by holding the water separate from the land. Here is a spring, or a swamp, or a run. I go into the land office and buy that, by filing a declaratory statement, taking up a homestead. I take it up and fence it. Now, here are thousands of acres of land near it that are rendered valueless, because I have the only 40 acres in the vicinity that contains the water, and the consequence is that I have the control and benefit of all that for nothing, and without paying any taxes. I would fix it so that this land should be surveyed with reference to the water. I would give a man enough to make a living on, and would make that water wholly free to all within reasonable limits. I would not let him be destroyed if he had only water enough for 100 head of stock. I would let him keep all that water, but if he had water more than enough for a hundred head, I would make him divide with others who needed it. The only true way of disposing of these lands is to divide up the water proportionately to the land. There are many places where there are valuable lands, and I have known persons who would take up the lands along the streams, and when I or any other man came along to take up part of that land, I could not do so, because it is all practically taken up by the man who controls the water. I would compel him to put lanes through his lands, so that other persons could use that water within reasonable limits. If there are any valuable mines upon that land, I would give persons the right to prospect and work them. And I would reserve, in selling the land, all the subterranean rights. Each pasturage farm should have a little tract of irrigable land upon it, on which a man could locate his home and raise a small amount of grain, to protect him against dry seasons. If it were possible I think it would be well to have pasturage communities about the water courses, in order that they might establish schools, churches, &c., and form intelligent communities. The foot-hill region I left out. There is in California a region called the foot-hills that reach all the way from this 300-foot elevation of which I spoke awhile ago away up to an altitude something like 2,000 and sometimes 3,000 and more feet, where the oak and nut-pine grow. There are, in these places, some of the finest lands in the world, and my opinion is that in time to come all the respectable farmers of California will live in the foot-hills, and I believe in time to come that the finest spots and the finest homes will be in these foot-hills. They are close to wood and water; they have a diversity of scenery; the conditions are more healthful than in the valleys, and then, too, a greater variety of farm products and fruits are grown there than anywhere else. You can grow fruits there that you cannot grow where it is warmer, because the warm air of the valleys will rise to that level, and things that would freeze in the valleys would not freeze there. These lands cannot be had by monopolists, because they are too remote and too scattered. It is the duty of the government to survey these places immediately, when they will probably be irrigated. Right in each of these valleys there is sufficient water to develop them, and they should be surveyed. It may be necessary to make a geodetic survey instead of the rectangular one, and, if necessary, they should do it. That country is not densely settled up, because you do not give them titles. Another thing, most of it is reserved as mineral. I do not think that agricultural lands ought to be set aside as mineral. When a man comes and locates on these lands, and just when he has the water going nicely on what is really agricultural land, some miner will come along and declare that it is mineral land, and, as the burden of proof is on the agriculturist, he can blackmail the owner of it for one or two hundred dollars.

Where the government gives a man title to small tracts in the mountains, I think he should have a clean title from the surface to the center of the earth. When you give a man a title to these large tracts of pasturage land or mineral land, I would reserve the subterranean mineral rights. In surveying the land I would take the topography of the ground and also the quality of the soil, the kind of soil, &c., and all that kind of thing, in a more thorough manner than it is being done at the present time. I would make a thorough physical survey, more especially of the water. If it was found out that the stakes of the surveyor were not firmly fixed and substantial, I would

make him amenable for it. If the geodetic points were established you could then survey isolated tracts accurately without going all over the country.

I desire to say another word. Within the limits of the railroad grants there is a great deal of land that is entirely pasturage, and I find it is very hard to dispose of it for the reason that the land is controlled in connection with the water. Sometimes you find a spring on a railroad section, and sometimes you find it on the adjoining even-numbered section, which belongs to the government. If it is on the even-numbered section, a person goes into the land office and gets title to 40 acres of it on which the spring heads. If he finds the spring is on the railroad land, he will go in and buy the tract upon which the spring is located. From experience, I find they do not take the remainder of the section on which the stream or spring was found. I found, after awhile, that if I sold that part of a section with the water on it I could not sell the remainder of the section on which it was situated, so I generally say I won't sell the land on which that spring is located unless you take the whole section. I think the land should be sold in blocks or strips, paying especial and particular reference to the water on them, and that a piece of agricultural land should go with the pasturage land. Where you have a government section intervening between two railroad sections, or a railroad section intervening between two government sections, you cannot make what they call here a ranch.

I think it would be wiser on the part of the United States to make some arrangement which would be mutually agreeable, so that there might be a fair interchange of the odd-numbered sections and the even-numbered sections, so that the government land should lie in a block or strip and the railroad lands in a block or strip. Then they could be sold out in tracts suitable for ranches. So far as the purely arable or agricultural lands are concerned, under ordinary circumstances this block system would seem to be all right; but I find many persons coming to me, some of them representing people in England, France, and Germany, and some from the Eastern States, who wish to emigrate to California—they say, "we want some twelve or fifteen thousand acres of land; have you such for sale?"

"Yes."

"Where are all these lands?"

I will then designate some certain locality.

They say: "Haven't you a body of land of those dimensions in one tract?"

"No; there are intervening even numbered sections."

"But you cannot acquire title to them except by pre-emption and homestead."

"No; but the persons you bring with you, if they are citizens, can have the benefit of the pre-emption act; they can pre-empt or homestead the government lands, and the railroad company will sell you the odd sections at a moderate price."

"Oh, no! that won't do at all, for they are foreigners; they cannot take up the land."

So I think that in land of that character an exchange would be beneficial, both to the government and the railroad company. It destroys the sale of the lands and prevents their disposal in that way. You cannot prevent persons from getting large tracts of land, even if you want to. If you look back at the older settled places, you will find single owners in possession of larger tracts of land than are embraced in those farms in California; but if these lands in California were surveyed properly, and the ownership put somewhere, there would be a fixed interest. They could not afford to keep them for an unlimited time.

Suppose I have got a very large farm; when I die, in the absence of any law of entail, it would be divided up and go to my children and heirs. I think, with regard to the lands of which I spoke, and the land which the desert act was intended to cover, that something should be done with them, for as it is at present they are entirely useless. Either the government should take back the railroad sections or it should give one tract to the railroad company and take the corresponding tract, making an equal division; or it should be divided up into blocks, or else the government should take control of the whole thing and sell it out, giving the railroad company credit for its lands. I wish it to be understood always that great care should be exercised concerning the water, and that all persons should have access to the water where it is in large quantities. Roads, lanes, &c., should be made through it that would be free to all, and the water should be considered common property. I have seen thousands and thousands of acres which are controlled by one pool of water, and the man who bought that water paid the government only a hundred dollars for it. He got one of his herders to live there during the time required by law, and then, as there is no water anywhere around there, he has the pasturage of all those hills and plains. No person can use the water but he, and he would not allow any one to come and take it. If that water right was divided up it could be utilized by many families. I think the lands should be parceled out in proportion to the water. If it was capable of watering one hundred head of stock, then let the spring go with a range large enough for one hundred head of cattle; if it was capable of watering a million head of cattle, I would then divide up the land necessary for that man's stock in such a way that all the stock

using it could have part of the water. I think that the true prosperity of the country consists in having the land divided up into small farms and held by a great number of persons; as it is in France, for instance.

There have been a great many land grants in California, and, as a matter of course, the persons who selected the land did not select the worst, but always the best; and the boundaries in early days were so indefinite and the papers were drawn so loosely that it was impossible to tell where the actual boundaries are or were at that time. Sometimes they would sell a tract of country which would contain three or four times the land grant, and so it happened that persons claiming a Spanish grant would take the benefit of the description and exclude other persons within the boundaries designated in that grant. A man would have a grant of 3 square leagues, but the description would contain 12 square leagues, and the man would have the use not only of the 3 leagues that were granted to him, but also the use of the other 9 leagues contained in the description, thus keeping settlers off from these land grants, which are usually of the very best quality. Now, I think these should be settled up immediately. I would not take from any man that which legitimately belongs to him, but I think his possessions ought to be segregated from the public domain very quickly and the other lands thrown open to settlement. They will assert that they have a right to hold all the land named in their description; and they used to sell off at high prices large tracts of land within these boundaries. Afterwards, when the survey was made, it would be found that these lands were entirely outside, and that really they had been selling land that did not belong to them, but to the United States; and the United States had so much sympathy for the persons who bought these supposed private lands that it passed an act giving to those who had bought in good faith the right to come in and take up these lands on the same ground as a pre-emptor.

Q. When a grant is stated to be within certain boundaries, which are described, does the grant as finally confirmed include only the ground stated, or does it include the whole area within the boundary stated?—A. In some cases it probably only includes the area stated in the grant; in some other cases it takes in a great deal more than the area stated. These boundaries are usually indefinite, and it is left for the owner to assert where the boundaries are, and the land within these limits is retained until final segregation.

Q. Can you suggest a plausible remedy?—A. This can be remedied by a provision for their immediate survey. Of course it cannot be done altogether, but it could be done in a very short time. If the law of 1866 was enforced it could be done in that way. That law provides for a compulsory segregation; and if that should be deemed inoperative a supplementary act should be passed which would meet the case exactly. It is an outrage upon the people of the State, and it is bad business on the part of the government, to allow that state of things to exist. There are very fine tracts of land withheld from settlement in that way. If a man has a legitimate claim, give it to him, but let it be determined immediately where that claim is, and then do not allow him to keep the land that he does not own. The government should make these surveys and keep the cost as a lien on the property, if the persons owning it are not willing to bear the expense. Of course it is to the interest of the grantee to keep off surveys, because he can then hold more land than he is really entitled to. In such case the government should go to work, survey it, and make the owner pay for it.

Q. Does not the law of 1866, if properly carried into effect by the officers of the United States, compel the survey of Spanish grants, if parties do not apply for the survey within ten months after pre-emption?—A. It does, but there are many laws that are void by non-user. The fault lies with the government and its officers. I think that the government does not pay sufficient attention to the matter.

In the next place, I think that, owing to the tenure of office in this country, there is not as much interest taken in public affairs as there would otherwise be under different methods. It could be done under the act of 1866, but I would have an additional act ordering the surveyor-general to do it, and I would have a commission organized for that purpose to settle all the grants in the States and Territories.

If there was a commission invested with the powers, and an appropriation by the general government made, to prepare a law compelling this thing to be done, I think it could be done properly, and I think it is to the interest of the people of the United States that it should be done.

In reference to the mining law, I desire to say that I think this idea of allowing a man to go in and make affidavit that a whole tract of country is mineral is wrong. There are a great many persons who for their own selfish purposes make these affidavits, under which much land in the mountains is excluded from settlement, and then they occupy them too. There are persons who wish to use these lands for grazing, and, in order to accomplish that without any expense to themselves, they make oath that it is mineral land.

Testimony of William Magee, deputy mineral surveyor, Shasta, Cal.

WILLIAM MAGEE, deputy mineral surveyor, testified at Shasta, Cal., October 2, 1879, as follows:

I have been connected with the public service in this county for twenty-five years as a mineral surveyor. I was the first deputy appointed in the county, and have been in that capacity every since. I connect my mineral surveys with the government surveys, or with the mineral monument when the surveys are not within proper distance of already established corners. There are mineral monuments erected in this district but they are temporary ones. I generally establish an iron bar and put a rock mound around it to make it more permanent than corners are generally made, and that is about the amount of it. I establish the location of that mineral monument by connecting it with the forks of the nearest streams, water-courses, or some prominent mountain point, and establishing a bearing tree. That is the only way that has ever been done by me.

Question. So that if the stream changed its course or if the tree were cut down you have lost your location?—Answer. The tree might be cut down, the stone removed, the stream change its course, and means of relocating the true boundaries of a mineral claim lost, but it is not likely that all these things would occur. Mineral monuments might be established more permanently so that they would not be likely to be removed, but the best way to my knowledge would be to identify them with a government survey whenever it is practicable. I hardly know of a mining district in this county where they could not be so connected. We are now limited to a hundred chains. The location of these mineral monuments is made at the expense of the claimant, and of course, having mineral monuments more permanent, would make the survey more expensive.

Q. In locating mineral monuments from the confluence of streams or from some mountain tops, do you really gain anything from the taking of such an indefinite object as a mountain summit as a monument?—A. I think on the whole you can. It is a large object, but a very permanent one. Such distances are at best indefinite things. Then you put your instrument upon a mountain head, you will determine that you are pointing right at the top of the mountain, and another surveyor will point his instrument several degrees away. I think it is a very vague kind of monument. Then, too, the forks of streams often change. I have seen it often myself, and I regard an artificial monument carefully erected as a better mark. The location of the monument is taken from the confluence of these streams and trees. I look upon a connection with a good surveying corner as being better than these things, better than the mineral monuments, and better than the fork or bed of streams or the top of the mountain. The latter I look upon as a very vague mark indeed. No two surveyors would hardly ever agree upon the same point. I would have the monument erected at some convenient point and where there are several claims to be connected by one monument. I have run to connect with the mineral monument as much as sixty chains, and when I was locating several connections with the same monument in running from the monument to the claim I run simply by the needle and chain. That is generally the way I run all claims. I use the needle instrument altogether.

Q. So that if there is any error in your variation, or any error in your chaining the location of the claim may be all out?—A. There is always error in chaining. There is not always any change in the variation of the needle. Variations of the needle occur more frequently in some places in these mountains than in others. There is several minutes variation, but the chain in this rough country varies more. I am generally particular to triangulate to a corner whenever I can. I think it is more accurate than chaining. If I chain I do both. If a system of permanent mineral monuments were established over a region and you locate claims by them, I think you could locate such claims very accurately. There need be no difference to the locator of the mining claim. Sometimes it would cost a deputy a few dollars more or less to do the work, which will amount to a mere nothing in the aggregate. If the government establish the mineral monuments, it would be less expensive to claimants and deputies and more permanent, and if it established the location of such monuments by correct observation, so that if they were removed they could be replaced, it would be much better, especially if they established several monuments within view of each other and connected the mineral claims with them. I think that would be decidedly better than to establish a monument for every claim. Then if one of the objects were destroyed it could be replaced by running from another one. The expense of establishing such monuments would be very trifling for the government. A deputy could establish all the necessary monuments on prominent points in this county by triangulation very simply, and it would cost very little to do it.

Q. Where you have a number of claims adjacent to or overlapping each other, and one of them has been surveyed, do you, as a matter of fact, generally locate the later claims from the location of the first one?—A. Yes, sir.

Q. So that if the location of the first was incorrect, it would necessarily follow that all would be out of place?—A. Yes, sir; to a certain extent it would.

Q. Could you not connect your mineral monuments with the township corner to establish your mineral claim? If your township corners should be obliterated, cannot they readily be re-established again?—A. They do very often get obliterated in this country, and I was at first very much put out by that fact until I became familiar with surveys here. When I first commenced examining the corners made a few years before, I found them obliterated and it was difficult to determine precisely where they were. I had to run lines to re-establish them. I thought then it was the fault of the deputy who had established them, but afterward I found that it was due to the destruction of the monuments from natural causes. I have found by experience that monuments made on gravel hills and on certain kinds of ground frequented by hogs are not at all permanent; frequently the hogs will root under them, tear them down, and scatter them for a grass or root that grows there. I found that to be the reason from my own experience. The hogs will destroy a rock monument in one or two or three years. The only thing that makes a permanent corner is a bearing tree. When the marks of a corner are obliterated you have no absolute certainty of being able to re-establish the same point if the bearing trees have been cut down or cut up. I can show corners established by two different surveys that are 14 rods apart where the corners and landmarks have been obliterated.

Q. Suppose you bring two sets of surveys from opposite corners; do you or do you not know of any instance where you can connect these, where they come well together?—A. I have known one or two instances; but where there is one instance where it will do it I have seen a dozen where it will not.

Q. Can you suggest any better way for establishing the corners of a government survey?—A. No, sir; I don't think that I can suggest any better way, except by being very particular in establishing with great permanency the corners, and establishing many bearing trees wherever it is possible to do so. They are the most permanent marks. I have known instances after a survey where they were all cut down, but it is very seldom the case. You can most generally find one or two, if not all. They are the most certain landmarks. I think they may be considered decidedly the best monuments. If you do not have a corner, they are the best monuments that can be suggested; they rarely fail. I do not know of more than two or three instances but where you can find one or more, and any one of them is enough to establish a corner from.

Q. What do you think of the propriety of abolishing all local laws and customs and obliging a party seeking to record a mineral claim to commence in the United States Land Office with an official survey in the first instance?—A. Do you allude to unsurveyed ground, or where a government survey has been already extended over it?

Q. Either.—A. In other words, make the claim legal through a government survey. It has always been my opinion that that would be a proper way, and that they should not get a title in any other way. In many counties there are no records of mining districts. In 1867 we could not find a scratch of a pen on that subject in this county. I have frequently had trouble about mining records, and I have frequently been consulted about them, and have been in the habit of making the record from my data and the man interested would take it to the record office and would bring it back to me. There is no such thing as a record of location except in a few instances where they have been made with the county recorder, but I do not know of a single mining district in this county where there is a record except very recently. Records are now made by miners, who are required to furnish a copy from the mining record, and they have in every single instance to be made new where they are called for. I have not been able to find many able to produce one, and I am spoken to almost every day about manufacturing records of this sort. A man is not able to describe a claim the way he wants to make his record, and sometimes I make a preliminary survey and by my preliminary survey the record is made. Afterward I make a legal survey by the record originating with myself. That is true with claims that have been worked successfully twenty-five years, and there is nothing unusual about that thing; it is frequently done. The mining records heretofore made, if any of them have been preserved, are of no value; it would not do to respect them. There is not one of those old records that describes the ground the claimant now wants to take up. He wants to change it in some point to suit himself, so that the location he makes now will not be the one he originally claimed. Where there is no conflict in the claim, I look upon it that there is no wrong done any one in changing it. It is all government land, and if there is no other claim conflicting I do not see any harm in it.

Q. Supposing that controversies had arisen between these parties who had new locations and others, how would that conflict be settled?—A. They would have to go into the courts and adjust them in some way that would suit themselves, and each one would have to make the best showing he could by parol testimony. I am telling you about the situation of those district records in this county. So far as I have had any knowledge of them, they have become obliterated and laid aside.

Q. Is there at any time any guarantee as to the integrity or protection of these records except the personal honesty of the recorder?—A. None that I know of. He is

under no obligations, and never even took an oath or gave a bond. It is all a matter of organization among the miners. When the district was organized some man was appointed recorder; three weeks afterward another man would be appointed, and most generally there has been a number. In some parts of the State it is different, but in this county it is as I have stated it. I confine my remarks altogether to this county. I think the proposition which I have heard discussed of selling mineral lands in similar manner to those sold for agriculture, by square tracts, and confining the owner of a vein within his side walls as bounded by his surface survey, would work great injury sometimes. A lode that would dip 45° a man would not be able to go very far down on before it got outside his walls.

Q. Suppose you gave a man 40 acres and restricted him to the ownership of that 40 acres?—A. Then he might be able to get more; but after the large expenditure of money on what might be a good paying ledge some one else would come in and take it away from him. I think that would be very obnoxious. I think he should be allowed to follow the dip.

Q. Suppose he was not restricted in his discovery shaft to the center of the claim, but could put it anywhere?—A. It would be liable to run outside the limits of a mine on which he had expended a fortune just as he was beginning to make it pay. I think that would work great injury in some instances.

Q. That would be so if he had only the amount of land covered by the present law, which is between 20 and 21 acres. Suppose he had made his discovery shaft on one side of the claim. He would then have 600 feet, and if his vein ran down at 40° he could follow it 2,000 feet in depth. Would not that practically cover all the deep mining that could be done for a generation?—A. That would be so if he had a regular cropping to begin with in the start. But I know of many mines that were worked several years before finding out that the vein is 300 feet or more from where it is thought to be, and a man may work ten or fifteen years before he discovers his claim, and then near his outside lines, when some one else would get the benefit of opening up his ledge.

Q. Suppose you gave a man unlimited right of inspection and restricted the application of the act to the actual working of the claim?—A. No, that would not do. The country would be entirely filled with explorers, and they would never be ready to fulfill the provisions of the act. I do not like the theory of restricting a man to his side lines. It might answer very well; but it has always occurred to me that where a man found a lode on the ground he should have the privilege of following that lode wherever it went, as far as he can follow it. I do not know of any mine down 100 feet. I have no experience in the litigation following deep mining. Under the law as it stands now any man taking up a lode claim outside of a placer claim, and finding the vein ran into the placer, he would have a right to run into that placer, and I think that would be right. If you take up a lode claim and develop it, it costs money and a man should have the benefit of it. Every one seems to understand that where a man has a lode he can follow that anywhere for 1,500 feet. There are difficulties that have started here, where a man can go upon another's ground and continue to take ore for a long time, and he cannot be driven off without expensive litigation and digging; but there is a limit to that sort of thing here. The quartz mines have been worked in this country about two years. The oldest claim has been worked twenty-five years. They are gold mines. I do not know any mines here that are down more than 100 feet. They have been stopping work. They came to a kind of rock from which they could not extract the gold, but they are doing some little thing with it now; but still they intend to apply for a patent for it. I cannot tell how long it would take them to reach the side lines of such a claim as that, made by a square location, which would undoubtedly do away with much of the difficulty of litigation. I do not know of any improvement that could be made in the placer law. I think it would be very difficult to draw any provision for easement for an outlet to such mines; if it could be, it might work well. I have never thought of it, except where I have purchased claims of my own. There have been no conflicts about outlets here that I have known of; no conflicts between owners of property, and no trouble about them.

Testimony of William Magee, United States deputy surveyor, Shasta, Cal.

SHASTA, *October* 6, 1879.

To the honorable Public Land Commission, Palace Hotel, San Francisco:

GENTLEMEN: In my statement to you made in the Shasta land office on the 2d instant I spoke of some inaccuracies in the sectionizing of some townships in this county. I expected to be asked to explain that matter; but as I was not, I will now ask to be permitted to state particulars.

In the fall of 1854, township No. 30 north, range 3 west, Mount Diablo meridian, was sectionized by Department Surveyor C. C. Tracy, and very soon quite a number of settlements made in the township; and in the year 1858 or 1859 some other man, a United States department surveyor (whom I never saw), came into the same township and resectionized the whole township and again starting in on the same south boundary line that Tracy had started from in his previous survey, but establishing the section corners over the entire township, differing from Tracy's corners from 50 links to 350 links as before stated by me. Very soon I was called on by some of the settlers to show them the correct lines, and on finding that there had been two surveys made extending over the township I immediately wrote to the surveyor-general's office for information as to which of the surveys was to be regarded as the correct one, and I was soon informed that the first (Tracy's) survey was the correct one, and I was requested to furnish the office with the name of the second surveyor, which I did after some inquiry; and I did not hear of the matter again until a few months ago, when our county surveyor happened to discover the awkward situation of these section lines, and without making any inquiry about it he made the matter the subject of a long article published in a newspaper, over an anonymous signature, and insinuated that I was to blame for the erroneous work. This is the only instance of any such erroneous work ever coming to my knowledge in the course of my surveying, and as I have several years ago advised the office of this discrepancy I should not have mentioned it again but for the publication made by our county surveyor.

Very respectfully,

WM. MAGEE,
United States Department Surveyor.

SHASTA, CAL., *September* 26, 1879.

Answers of William Magee, of Shasta, to questions submitted by the Public Land Commission.

To 1st: My name is William Magee; residence, Shasta, Cal.; my occupation, surveyor.

To 2d: Have lived in Shasta, Cal., during the last twenty-five years.

To 3d: I have acquired title to various tracts of land by purchase at the public sales and by private entry; also, by purchase, school lands from the State of California under the State laws; also, placer-mining land from United States Government.

To 4th. By general observation as a private citizen.

To 5th: Uncontested applications from six months to two years. Contested applications from one year to seven years.

To 6th: There does appear to be some defects in the land laws; but as these laws are so voluminous, I cannot undertake to make any suggestions for a remedy.

To 7th: Shasta County is about 60 miles north and south, and about 100 miles east and west. The Sacramento Valley runs from north to south through the county, being about ten miles wide. About one-third of this valley is good tillable land, the balance mere pasture land. Timber only fit for firewood. The land on the east and west of the valley is rolling gravel-hills, interspersed with small valleys, nearly to the summit of the mountains to the east and west. These valleys contain good tillable land, generally well watered, while the ridges and high lands are only fit for grazing lands. Placer gold-bearing mines, and also gold, silver, and copper bearing ledges, are found and are now being worked in many of these low hills and mountains. Iron of a very superior quality has been found to exist in large bodies in these mountains. A soft coal is also found in small bodies in the low hills. Marble of a very fine quality and in large bodies is also found in these mountains. And on the high mountains every kind of pine timber, of the finest quality, is found in inexhaustible quantities and extent.

To 8th: I have not had an opportunity of examining the acts of Congress prescribing the duties of the Commission.

To 9th: I do not know that I understand what is meant by parceling surveys. If it is meant to extend the public surveys, I am of the opinion that the long-established present system is as good as any system that could be adopted, for the reason that our people seem to understand the present system well, and no good could result to the settlers by a change.

To 10th: In my opinion the present pre-emption and homestead laws are all that the actual settler should require—all that the *bona-fide* settler should ask for should be some modification of rules in filing and proving up his claim; much cost of advertising and filing notices, where there are no conflicting claimants, might be dispensed with without injury to the government or to any other party.

AGRICULTURE.

To 1st: Nothing.

To 2d: From October to May; quantity from 60 inches to 100 inches; does not fall at the season when irrigation is wanted.

To 3d: Any portion or all can be cultivated for grain or hay without irrigation.

To 4th: Not more than one-tenth part of the whole land.

To 5th: Hay, corn, and all kinds of vegetables.

To 6th: The irrigation of wheat is not known in this country; that crop grows only in winter during rainfall.

To 7th: The Sacramento River and all of its tributaries.

To 8th: I have never known any injury done to land by irrigation. Good crops of wheat and all kinds of vegetables are raised at the altitude of 5,000 feet above tide-water; but at that altitude the bodies of tillable land are very small but very fertile.

To 9th: As a general thing the amount of irrigating water returned to the stream after being used is very small, all depending on the situation of the land irrigated. I do not know of any local restriction in regard to the use of irrigating water, except that the oldest claim controls the water for all time to the extent of amount claimed.

To 10th: The taking up of irrigating water is regulated by common custom, and also by State laws. It is only our small streams that are taken up in this county for irrigation purposes; none of the large streams are taken up for irrigation as yet.

To 11th: I have not known of a single case of a conflict about water taken up for irrigation. But for milling and mining purposes the conflicts have been numerous and the litigations have been frequent and very expensive to the parties interested. Conflicts have generally grown out of the loose mode of taking up water-rights under mining regulations; want of system. This shows the great evil growing out of mining laws.

To 12th: One half at least.

To 13th: In my opinion it is neither practicable nor expedient to establish homesteads on pasturage lands. These lands should be disposed of by the government for cash only, and in large tracts, if desired by the purchaser, say from 1,000 to 2,000 acres to each settler, if a limit is necessary.

To 14th: Yes, these lands should be put in market at private entry for cash only, and let the boundaries be described by natural boundaries (natural streams or ranges of mountains), and the extreme limit not less than 5,000 acres—as might be desired by the purchaser.

To 15th: I have no means of knowing what number of acres of our common grazing land would be sufficient to raise one head of beef for market; I presume that the grazing land in this county is about the same as in other parts of this State.

To 16th: I am not competent to answer.

To 17th: I cannot attempt to answer.

To 18th: Diminished.

To 19th: Cattle raisers do not fence their ranges; cattle could not be confined by fences during winter on the range.

To 20th: I do not think they would.

To 21st: Abundant at all seasons.

To 22d: I am not competent to answer.

To 23d: Sheep pasturing increases the grass because it manures the land.

To 24th: Sheep and cattle will not graze on the same land; cattle will leave.

To 25th: Joint occupation of the same land by sheep and cattle owners is not attempted here, it being impracticable.

To 26th: I cannot state as to the number of either in the county. Cattle are owned in herds of as many as 1,500 and sheep in herds of as many as 5,000 head.

To 27th: I do not know of anything further necessary to be stated here.

To 28th: In many instances where the surveys have been made a few years it is necessary to call a surveyor to ascertain the location of the corners as from the lapse of time they become obliterated.

TIMBER.

To 1st: It is very difficult to approximate the amount of timber land in this county; all of our mountain ranges may be classed as timber land. The quality is pine, fir, and cedar, all valuable to manufacture into lumber. Water privileges very good in the mountains where the timber grows.

To 2d: No such thing as planting timber known in this county.

To 3d: I should suggest as the minimum price $2.50 per acre, to be offered at auction in lots of 160 acres, and if a limit is to be placed on the amount to be sold to one man; let that not be less than 5,000 acres. I name a large limit, because a man who wants to go into the lumber business will not buy a small tract of land. All government land should be sold for cash only.

To 4th: I do not see how timber land could be classified beneficially for the government.

To 5th: My observation has been, when pine timber is felled a scrub oak springs up, and is valuable for fire-wood only in about 15 years. When oak is felled a scrub pine springs up, but is of but little value for any purpose.

To 6th: I settled in this county when all of the mountain portion of the county was occupied by the wild Indians, and then the woods was burned over every year by the Indians without any damage to the timber. As soon as the whites settled in the low mountains the setting out of fires in the mountains was stopped, and very soon prohibited by law, with heavy penalties. The result was the leaves fell from the timber and became very thick on the ground in a few years, and when fire did accidentally get out the heat was so great that it destroyed all timber as it went over the ground. I should suggest frequent burning of the mountains to preserve the timber, as fire is sure to get out sooner or later.

To 7th: In my opinion, to sell the land is the only remedy. A law against trespass on timber is a dead letter on the statute-books, as experienced.

To 8th: I do not know of any custom of cutting timber on the public land, except that every man cuts all that he wants.

To 9th: From my own observation I have long since come to the conclusion that any laws against trespass on timber on the public lands, no matter what is the penalty nor in what officer's hands it is placed for execution, is a dead letter on the statute-books; and, likewise, a stumpage law would never bring a dollar into the public treasury.

LODE CLAIMS.

As to interrogatories from 1 to 19 inclusive, I do not consider myself competent to make any valuable suggestions.

Interrogatory 20th. I am of the opinion that all contests and conflicts as to title should be left to and decided by the United States land officers, in the same manner as contests under all other land laws.

21st. I could not make any suggestion.

22d. I am of the opinion that all locations should be filed in the county-record office in the county where the mine is situated; and that application for a patent should be filed in the United States land office of the land district within twelve months from date of location of the claim, and pressed on to patent without unnecessary delay.

PLACER CLAIMS.

1st. It is very difficult to state even approximately as to the amount of placer-mining land in this county. The land of this character which now remains unworked is generally gravel hills, and generally deep gravel deposits.

Interrogatories 2 to 8, inclusive. I do not believe myself competent to give any information of value.

9th. I do know of quite large bodies of placer-mining land in this county, which is known to contain gold in quantities that would pay for work, that if water was introduced on to it the working might be stopped for want of outlet. Therefore it might be well for the law to provide a mode of obtaining an outlet for tailings for all such land.

I would now make one suggestion as to mining districts and mining-district records, from my own knowledge of the facts as to the very loose and irregular manner in which they are generally kept: that such records should cease to be recognized in law so far as all future records hereafter made in that way are concerned.

WILLIAM MAGEE.

OCTOBER 3, 1879.

Testimony of John Markley.

SALINAS CITY, MONTEREY COUNTY, CALIFORNIA.
September 30, 1879.

My name is John Markley; residence, Salinas City; occupation, county clerk. I have lived in Monterey County about nine years. I have not sought to or acquired title to public land for myself, but I have obtained titles for others. I have been county clerk nearly six years, and have made many applications for public lands for citizens of Monterey County under the pre-emption and homestead laws, and have taken proofs in homestead cases. From my personal experience I find the great delay in getting patents from Washington a source of very great annoyance.

California is a mountainous country, with valleys running through it. A very large part of this Monterey County is covered with mountains. All the good valley and a large part of the best hill grazing land is covered with Spanish grants; then a very

large part of what is left is reserved and covered by the Southern Pacific Railroad and Atlantic and Pacific Railroad reservations.

What we want in this part of California is the restoration of the lands held under the railroad reservations, so those lands can be taken up by pre-emption and homestead settlers; then we want all the lands surveyed, so after all those lands that are fit for pre-emption and homestead settlers have been taken the balance can be sold for sheep ranges. The valley land in Monterey County is used for raising wheat, barley, potatoes, beets, beans, &c., principally wheat and barley. The hill land is used for dairy purposes and grazing sheep and cattle. The full, actual cash value of the great bulk of the mountain grazing land in Monterey County is about 60 cents per acre, and the value of the choice spots of mountain that would be pre-empted and homesteaded is from $1.25 to $3.50 per acre.

A part of the Salinas Valley could be irrigated from the Salinas River, which is much needed in dry years. It only rains in the winter in Monterey County, commencing generally in November and ending in April. The valleys have little or no timber; the mountains have live-oak, white oak, &c., only good for firewood. There is some good redwood on the coast in very rough mountains.

No mining of any note in Monterey County; some good indications of coal and gypsum.

Testimony of John S. McBride, San Joaquin, Cal.

SAN JOAQUIN, CAL., *October* —, 1879.

JOHN S. MCBRIDE made the following statement:

I came here in the fall of 1865. I have been engaged in mining and am well acquainted with mining purposes.

Q. Are you acquainted with the timber?—A. I can't say that I am. When I came here the timber was pretty well cut off.

Q. Do you think the timber is being destroyed?—A. I think so, but I have no knowledge of the matter only from hearsay.

Q. What is your opinion about reserving this mineral belt?—A. I think it is beneficial to mining interests. I think altogether it has been beneficial.

Q. Do you think it would be to the interests of the country still to hold this land?—A. I think so. I do not agree with Judge Stiger in putting the lands on the same footing and sell them all at the same price. I think the mining interests would be taken advantage of. Parties would take up lands for agricultural purposes, knowing it to be mineral, and hold it for speculation.

Q. They can do it now, can't they? By the way, how many claims can a man buy?—A. I suppose a man can buy all the claims he can pay for. In making selections I believe a party can take up forty acres for mineral purposes. The distinction is this: that you require a man to do a certain kind of work has not a good title to mineral land. I do not know that he is compelled to do that; he is compelled to do that in taking up agricultural land.

Q. In taking mineral land is there any advantage to the country in permitting a man to file on a claim, to hold them by possessory right without obtaining title to them, to paying for them?—A. The benefit to the party would be just the same whether he acquired a government title or not if they develop their mine, but if they take it up for speculation simply, I think they ought to be compelled to pay. I think a law does require to do something with it before they can obtain a patent.

Q. You know many claims are simply held on application?—A. That is true, but they are required to do considerable work before they obtain a patent.

Q. In hydraulic claims are they required to do any work before holding them?—A. They are required by local laws to do it.

Q. Suppose there are no local laws?—A. I believe that all cases that have been tried here have rested on that basis.

Q. Suppose there are no local laws which govern the taking up of claims, are they required to do any work?—A. I do not know local laws. I believe the law requires before they can get a title that they must do so much work.

Q. What I want to get at is this: a man filing on a piece of land, and without doing any work, and without taking the proof up and obtaining a final patent, holds the land simply by his filing this to one quarter title to your land for an indefinite time; eventually if they want to sell they complete their titles and sell them, and very often they hold the same for an indefinite time on the mere filing. That is wrong—to merely locate a claim, doing no work and holding it under an application. Would you shorten the time, so that in a limited time a man who files on a claim must go ahead and complete his title?—A. I would not, so far as my opinion goes. I would not care whether he got a government title or not if he developed his mine by working on

it, and thus carried out the intention of the government in disposing of the mineral land.

Q. What have you to say about the *débris* question?—A. I cannot say that I am familiar with the *débris* question. I am not acquainted with the lower country. I have passed through it several times. I suppose that the agricultural lands in the neighborhood of the Yuba River and Bear River have been injured to some extent by the sediment that comes down from the mines. There is a belief that hydraulic mining is doing great injury now. I think that the streams have filled up so that the washings spread without running down so far as they did. If there is any injury it is confined nearer to the foot-hills than it was in earlier days.

Q. Have you any remedy to suggest?—A. No, I do not know that I have. My opinion is that there ought to be such, or government aid, so as to protect both interests.

Q. How could that relief be extended by the general government?—A. I do not know just exactly how it can be done. I have no definite plan. The government, however, can furnish means to build levees and build dams, flumes, or something or other, and through these flumes carry the *débris* on the tule land, or dam it up on the foot-hills, and keep it from spreading out over the agricultural land. I presume it would be a benefit to the tule land to have the *débris* carried down on it.

Q. Do you think the government ought to do that?—A. Either the government or the State. The work could be done just as any other internal improvement which the government makes (keeping open navigation, for instance) that would be for the benefit of the people of this State.

Q. How would it benefit anybody except relieving the mining classes of a certain difficulty that distresses them?—A. It would relieve the agricultural interests, too. We think that mining is a public benefit.

Q. Is it your opinion that the complaints that have been made are caused by *bona-fide* hardships, or are they fictitious cases, made for the purpose of obtaining excessive damages from corporations?—A. I have no definite information on that matter. I presume we have been damaged to some extent, but I do not think we have been damaged to the extent that has been claimed. I do not know just what particular claim any one has. They claim that their land is destroyed, while there is a claim that the land has been improved by the deposits or slickens. I think in some places it will raise better crops than before, but I am not familiar with the matter; I only state from hearsay.

Testimony of John McClay, of San Joaquin, Cal.

JOHN MCCLAY, of San Joaquin, October 24, made the following statement:

I have been here since the fall of 1853; have been engaged chiefly in mining. I am somewhat acquainted with the timber-land country.

Question. To what extent has the timber been destroyed?—Answer. I am not prepared to give a definite answer, but there has been a great waste of timber. I concur with Mr. McMurray that a great deal of pine timber has been cut down and allowed to lie and rot. They would take two, three, or four cuts, say 20 or 30 feet long, and leave the rest. There has been a great deal of that in Sierra County and it is going on there now.

Q. What would be the most effective way of preserving the timber?—A. Private ownership, I think.

Q. Would you place a limit on the amount of land you would permit a person to take?—A. Well, in this part of the country it would be necessary for a man to own quite a large tract of land in order to make it of any value to him. The making of roads would be expensive, and it would be only useful for milling purposes. It is so far removed from everything else that it requires a great many roads to get your lumber out and get your logs to the mill. For that reason a small tract would not pay for the investment.

Q. Are you familiar with the *débris* question?—A. I am familiar with it somewhat.

Q. To what extent are the agricultural lands being injured, in your judgment?—A. So far as the Yuba lands are injured I agree with Mr. O'Brien's statement. I think his statement was correct in regard to the damage done on the Yuba River, but the Bear River I am so familiar with, but I understand that some of the land has been improved and some of it very much damaged.

Q. Have you any remedy to suggest?—A. I have read a good many different plans suggested, but it seems to me that the most feasible plan that I have read is this: dam the rivers, stop the tailings, and take the water out on the plains below here. It seems to me to be a good plan. There are many low places that can be filled up down in the foot-hills and on these red lands, enough to hold all the *débris* there is in the country. It would make very valuable land of it; in fact a gentleman told me last winter—he was complaining very bitterly of the *débris* question, but he finally

acknowledged that he had received thousands of dollars' worth of good from it. On his land they filled up the tules for him, and it is now the best of land.

Q. Are there any large bodies of tule land?—A. Yes, they are in the vicinity of the Yuba River and below that on the Sacramento River.

Q. Do you think it practicable to carry the confined silt so far as that?—A. I think it would be more practicable to put it on the plains outside of Marysville, and use the water for irrigating purposes. It would then make all that land valuable. As it is it is comparatively worthless.

Q. Do they irrigate much here?—A. They do where they can get water to irrigate. Without water we cannot raise fruit or anything.

Q. Do you raise much wheat here?—A. Not any, except for hay. We sow it in the spring. The owner cuts it for hay.

Q. What do you think of the policy of retaining the mineral reservation on this land?—A. I think the present policy is a good one and should be continued.

Q. Does it tend to the injury of the agricultural industry?—A. I think not; I do not see that it does.

Q. What do you think about the policy of shortening the time in which a man can obtain title to the placer land?—A. I think it would be an excellent plan. It would stop so much speculating and holding claims for the purpose of speculating without developing it. If a man could get his title in six months or a year he could develop his land sooner.

Q. Give your opinion of the practicability of restricting the time of placer claims.—A. I think it would be a good policy for the government to pass a law restricting the time. A person who makes application for mineral land should be compelled when they make the application to pay for them, or they forfeit their right of possession, and I would remove the restriction compelling them to do $500 worth of work. Five hundred dollars' worth of work may be placed upon land that may be worthless. I should remove that restriction and place a restriction compelling them to pay for their land in one year or else forfeit their right. I think it would be a good idea to pass such a law, and I think the $500 restriction should be removed. The money may be spent on it and prove valueless when the parties come to work their mines.

Q. What would you do in the case of an adverse claimant?—A. In such a case if the other party did not make his payment inside of one year, let the adverse claimant into possession of it, if he pays for it. I would cut off these men who file upon land and hold for speculative purposes. Under the decision of the Commissioner a man can hold the land forever, and no person can claim that tract of land. He need not pay for it, but just have the survey made and file it in the land office, and there he holds it for all time to come. Plenty of this land is held now right here. Parties have had the survey made and filed on it, and there it lies. I would have a law passed by which he could not hold land for more than one year in that way.

Q. Why should he not have as much time as an agriculturist has?—A. The object of the two is very different; in one case a man wants to get a home, and the other simply wants to make money out of it.

Testimony of John McDonald, San Francisco, Cal.

JOHN MCDONALD testified at San Francisco, October 14, as follows:

I have lived in the State about twenty-nine years. I am not very familiar with hydraulic mining, but I will answer some questions that have a bearing upon hydraulic mining.

Question. You understand the classification of land which we have adopted?—Answer. Yes, sir.

Q. How can the timber land be best utilized and disposed of?—A. I have been in timber land a good deal, and I have seen so much waste and destruction of it as to excite in me the highest concern, and I might say indignation. I believe the only way to protect the timber is to put all such as is within reach of the market into private ownership. I do not mean to say all the timber in the country should be sold, because a very large portion of it is beyond the reach of a market at this time; but all that is now within reach of the market should be surveyed and sold, in such tracts as experience might suggest and in such tracts as would justify the erection of extensive works for the manufacture of lumber and in furnishing wood to quartz miners for the purpose of timbering their mines. A great deal of it is used for that purpose. You must have mills in the first place, and you must have roads in the next place, and both mills and roads are expensive in this country. Roads have to be constructed, running into the timber regions from the place of demand, probably ten or twenty miles. Timber has to be transported on wagons, and there are many expenses to be incurred in getting it to the market. I believe the timber land should be graded and

classified, and the price graded correspondingly. Some lands are much more valuable than others.

Q. How would you protect the timber that did not get into the hands of private individuals?—A. When you get into the timber beyond the reach of a market, there is not much danger of fire. First, the hunters and tramps and campers do not penetrate beyond the border lines of where profitable operations are being conducted, to any great extent. Secondly, the trees are in a state of nature, the ground is not covevered with brush, and it does not readily burn in the deep forests—at least not so readily as where it has been partially cut and worked over. The largest source of the destruction of timber is the inconsiderate cutting and the felling of trees, leaving them upon the ground to rot and start the fires that destroy the forests.

Q. Are these timber lands valuable for agriculture—the timber lands that are not included in the arable region?—A. As a general rule I think the timber lands are not valuable for agricultural purposes, in the higher altitudes. I believe there is a very large amount of land that has been covered with timber in the lower foot-hills that is valuable for agricultural purposes. In California (and it is of California that I am mainly directing my remarks) the foot-hill region is the region the mineral is found. On the flanks of the mountains the land was covered sparsely with timber; had it been cared for, it would have been very valuable to-day for the timber that grew upon it. The timber being gone a considerable portion of it is now valuable for fruits, vines, and berries, and it even embraces considerable tracts of grain land.

Q. This tract is withdrawn from sale, is it not?—A. Yes, this is a gold and mineral tract, and I believe it has been withdrawn from sale.

Q. What would you recommend in that case?—A. I would recommend the sale of it for agricultural purposes, reserving the right to explore for mines. I would sever the subterranean from the surface rights. The man who buys agricultural land buys it for what the soil will produce; he does not buy it for what is in the bowels of the earth, which will enhance, and it may be exceed, the value of the surface.

Q. Would you do the same with timber land?—A. Yes, sir; any land that is sold for its surface vegetable productions, whether timber, grain, or fruit. I would reserve the right to explore for mineral.

Q. If the government, in the body of a patent, reserves the title to the mineral in the land, a man's title is uncertain; but if they make no reservation except simply of the subterranean values, that is a different thing?—A. That is the sense in which I meant to be understood. That the government should sell the surface as agricultural land absolutely; and if it is found to contain mineral, the man shall be compensated fully for all that is taken off his surface—fully compensated for its value; and it should be taken as railroads take land for railroad purposes, or something in that style. The ownership is absolute, and the owner of the soil must be fully compensated for any damage done him. It is to the interest of the miner, it is always to the interest of the owner of the soil, that this provision should be made, for this reason: if the miners discover valuable mines they pay him all damage done him, while the value of his land is enhanced by the prosecution of the mining industry. The two interests help each other. Furthermore, the man who buys the soil is not a prospector for mineral, and if the mining professional is forbidden to go on the land its mineral wealth will never be revealed. We have two classes (almost orders) of men who follow mining. The men of the one class, wherever they go, keep their eyes open looking for indications. They are hunting for the precious metals, and it is this class of men who will discover the mineral. If you wish to develop the value and wealth of the land, you must allow the miner to prospect for it; never, however, to the prejudice of the interests of the agriculturist. If the miner wants to do anything there, he must pay for all damage he may commit.

Q. If the great body of mountainous lands in this country pass into private ownership for timber and pasturage or agricultural purposes, do you think that it would impede mineral discovery?—A. I think if all the lands are given into the ownership of agriculturists, absolutely, with a title from the surface to the center of the earth, as has been stated to this Commission, it would stop the development of the mineral interests.

I wish to add that the wealth of what is called the mineral region or belt in this State is yet, in the opinion of a number of men, in its infancy as to development. They have scarcely scratched the ground, and a great many mines of great value and importance will yet be discovered. The mines already known, now too low in grade to be worked, will be successfully worked by improved machinery that will hereafter be discovered.

Q. Give us your opinion of the best system of disposing of the irrigable lands and for the utilization of them, having in view these two facts: first, that the greatest development of the interest of the country is advantageous to it; and, secondly, that the disposition of the land to the greatest number of holders is of advantage to the country.—A. I will say that ever since I have been in California what is considered non-productive land without irrigation has been yearly growing less and less. When

I came here the whole country was considered a desert and non-productive, and I know lands now between this and Sacramento that a man would not have paid for the surveying of in the early days, in 1862, that are to-day worth from $20 to $50 per acre, and produce fine crops without irrigation, and I believe the same thing is true of most of the land in this State. By the adaptation of crops, by plowing the soil deeply, by plowing early, by summer fallowing the land, and dividing it up so as to cultivate the different sections alternate years, and alternating crops, I believe that nearly all the land in California will ultimately be productive without irrigation; and I believe further that the possibilities claimed for irrigation are largely overestimated. When we have anything like an average rainfall in California you can produce a crop by judicious cultivation almost anywhere.

Q. Do you think you can in the Mohave Desert?—A. I do not know whether it can be done there or not. I am informed that in Central California this is the case. I want to say that when we have an average rainfall, as stated before, we can produce a crop almost anywhere; and when we fail to have that rain in the valleys, then there is likewise a failure of snow in the mountains; and if it is a dry year there is no water to irrigate with or fill your ditches with, hence, I believe the possibilities claimed for irrigation are largely overestimated. The use of water from artesian wells will largely contribute likewise to the production of crops, fruits, &c.

Q. In the region where agriculture is manifestly dependent for certainty upon irrigation, would you suggest anything about the disposal of the lands therein?—A. No, sir, further than to let it wait. There is no scarcity of land here. The land can be had at government prices, or it can be had second-hand from men who have bought it for speculation. As regards those lands that are considered non-productive without irrigation, I would rather let them wait than to dispose of them for nothing.

Q. Do you recognize what we call pasturage lands, where they are valuable for pasturage only? What system would you suggest for disposing of them?—A. I would suggest that they be sold to private owners in tracts of such size as would justify men in settling the land; sell a man one, two, three, four, or six sections, if it should spread over the mountainous lands. In some instances I would sell him even more than that.

Q. Are these lands used for stock?—A. You can get surface water in many places by digging wells, and there are occasionally springs flowing out of the cañons. There are some places that can be used at present, and there are other places that can be used in the future by artesian wells. I believe almost all the land in California in the central part may be used for stock watered from wells, either the ordinary surface wells or artesian wells.

Q. Would it not be an advantage if every pastoral farmer had a little piece of land that he could irrigate to make farm land so that these industries would be mixed?—A. I think there is scarcely any place where a man can't find such a tract upon which he could produce fruits and garden vegetables for his family and a little hay for his stock when it was necessary.

Q. Do you think it advisable to lay out these tracts with a view to securing that?—A. No, sir. I would allow a man to go and choose his land, selling what he wanted within certain limits, and he would find for himself a place that would suit him. The first that made locations would perhaps get the best, the next would get the next best, and so on.

Q. Would not that result in taking up the springs and little streams into individual ownership, and thus give such a man command of a great pasturage tract?—A. The streams and little rivulets are all taken up all through the districts. Really none of the public land is taken up, except that which contains the water. This is not altogether true in Southern California, but it is true to a large extent all over the State. The possession of good wells makes a man independent almost of these little streams.

Q. In Central and Northern California, Western Oregon, &c., there is a great body of land, that we call arable, where agriculture is sustained by the precipitation of moisture and without irrigation. Would you suggest any changes in existing laws in regard to that?—A. No, sir. I find no fault with the land laws so far as they apply to that kind of land.

Q. Could the method of obtaining title to land by pre-emption and homestead be simplified, to the advantage of the applicant for land?—A. I think where the law is administered with impartiality and courtesy to the applicant that the present law affords facilities enough. I mean where it is faithfully and diligently administered. I have heard that that is not the case in the land office, and I think that such complaints must be sometimes well founded.

Q. Have you considered the subject of mining and lode claims?—A. Yes, sir; some.

Q. Do you think that the old district-mining system, under which miners organized mining districts, and by which titles to mineral claims are initiated, and in which districts they are without local laws, are of any further advantage?—A. No, sir; and they ought to be abolished, and the laws should conform to the laws which have been and which shall hereafter be passed by the general government.

Q. You are aware that the present law gives a man the right to follow the dips,

spurs and angles of his lode. Do you approve of that?—A. That is right, sir. A man, when he locates a ledge or lode and begins to develop it, should have all the benefit it will yield him, and it should be his. Wherever it wanders to he should be allowed to follow it along.

Q. Do you prefer that to a square location?—A. Infinitely, sir. The square location is very unjust and works great injustice. A man might locate a claim costing large sums of money and much labor for its development. He might prove it to be valuable, and its dips and angles might be such as to directly take it off his mining claim, if the locations were made by vertical lines. He should be allowed to follow it wherever it goes within the limits of his end lines, which should be vertical and parallel with each other.

Q. You have some knowledge of hydraulic mining; to what extent is that kind of mining carried on here?—A. Very extensively. My understanding is derived from two sources of information, which leads me to believe that it is an extensive interest in this country.

Q. Is there not a complaint that the wastage of tailings from the hydraulic mines is destroying large tracts of agricultural land and injuring the harbors of California? What is your opinion about that matter?—A. The complaint is not well founded. That the rivers do carry some earth loosened by miners out into the valleys and into the bays is doubtless true; but it is but a small percentage of the whole that is carried down. Hydraulic mining is not the chief source of these immense deposits of sediment. Every industry of the people of the State contributes to it. Agriculture contributes very largely to it; grazing contributes to it through the animals running over and dragging up the mats of roots and loosening the soil, and subsequent rains washing it away. The lumbermen contribute to it very much; every log he drags over the roads loosens the earth, and eventually it is washed into the rivers. Every wagon-rut, railroad, and county road contributes to the sediment that flows into the cañons. I have seen acres of earth slide bodily down the mountain-sides into the rivers. I have known the cutting of a wagon-road along the mountain-side to so take away the props to the soil on that side that a heavy winter rain carried the whole mountain-side down, acres upon acres, with the forest trees upon it, until it obliterated the marks of the road. The soil in our valleys, even in the agricultural portion, is being washed away, and you can go along and find great gulches ten feet deep and twenty or thirty feet wide that did not exist there twenty-five years ago. The stock trampling over the grass have broken up the roots or mats, and the soil which they held together begins to crumble, and then the rains of winter carry it off little by little. It cuts off the bank by the square yard. These are things that did not exist in California prior to its cultivation.

I would like to say a word about the timber. I feel a great concern and indignation at the manner in which the timber of this country has been wasted and criminally destroyed. I have seen whole tracts of timber cut down and left to rot upon the ground because the enterprise which prompted its cutting was not well considered the project was abandoned, and the whole forest rotted and wasted. Within the lines where once was a splendid growth of oak and pine sufficient for the fuel and for all the lumber necessary on this coast for one hundred years, if it had been judiciously handled, it has been entirely denuded, and you may walk over land and find the stumps and mutilated trunks lying there now. Thus they are cut down by the wasteful hand of man, who had no interest in protecting them, and lay there rotting. I want to say another thing. The government should send its surveyors ahead of the axmen and lumbermen, and not follow behind them. The rule here has been that all the timber is cut and wasted before the survey is made. It is to the interest of these lumbermen to keep the surveyor from overhauling them, and they succeed in doing it. Surveys are generally made where it is most advantageous to the surveyor, without reference to the wants of the people. The valuable timber lands are usually rough and interspersed with underbrush, and it requires a great deal of labor to cut the brush in order to run the lines through. The surveyors do not like to have to chop like that; they want to go upon the plains where they can see from one corner of a section to another, where there is no bush in sight, and then measure it off by miles without reference to whether it is desert or agricultural lands or desirable for any purpose. I think the contract system would work well when submitted to competition, and would perhaps secure a better survey than we now have. Then if a man went into a rough country he would receive a proper price for the work done there. I think the present law allows a survey of the lands easiest and the quickest surveyed, without reference to the desirability of the land. It cannot be of any value either to the government or the people to have desert lands surveyed, because no depredations can be committed upon that character of land, while the timber land is being despoiled of its value every year.

I have had some experience in the marking of sections. The corners as established by surveyors do not amount to anything, particularly in grazing districts. Cattle and sheep knock them down and carry them off the first thing; fires burn them off, and

the stock also destroy the mounds, and all signs and indications of the lines are lost. There should be more permanent monuments of some kind established; either hillocks thrown up or some permanent monument located.

Accuracy in the original survey is highly important. A man may locate a pre-emption claim and he will purchase that land according to the official survey. Sometimes the post that designates his corner is lost, or stolen for a purpose, and no man can tell exactly where it stood. A survey is accurately made, and may change a man's house, or barn, or mill off that section which he bought on to another man's land, and he thereby loses it. I have known instances substantially of that character. Therefore, accuracy in the survey is of the highest importance, because if accurate in the beginning all after surveys conform to it.

Testimony of James McGillivray, of Oakland, Cal.

JAMES MCGILLIVRAY, of Oakland, Cal., testified at San Francisco, October 11, 1879:

I have lived in California since 1850. I have been in different localities, and have acted as an expert in mining cases. I am familiar with hydraulic mining, and follow that business.

Question. State what injury is done by hydraulic mining to the agriculture of the State.—Answer. There is a portion of the State where the land would be injured by hydraulic mining; some low land in the neighborhood of Marysville, for instance. I consider that the amount of land that would be injured by it would be very small in comparison with the benefit that would be derived from gold-mining. Hydraulic mining is the sole cause of the population that is in eight or ten counties of this State. Many millions are invested in ditches and dams and mining operations of different kinds. I think that it only injures a few thousand acres in the neighborhood of Marysville, at the mouth of Bear River. That is the only portion of the State that it has injured. The northern portion of the State is not affected at all. In Trinity and Shasta Counties and south of Nevada County it has not affected the land. I do not think hydraulic mining is doing any injury to harbors. By examining the overflow on lands in this place it is found to be salt marsh. Underneath the upper soil it is all stratified with a clayey substance which was formed there by water that came down previous to the commencement of hydraulic mining operations. Of course there is some that comes now, but not enough to affect the bays, as the water which flows out of the Golden Gate is sufficient to scour the harbor and keep it clean. I think the river can be helped by a straightening process. Wherever water is running in small streams or ditches for mining purposes it always runs well; where there are sharp turns it runs very badly. This is the same case with the Sacramento River. If they were to cut off the sharp points and fill in the curves with walls, I think the river would scour out and be improved. I think the difficulty would be relieved by straightening this channel so as to get a more rapid flow of water, causing scouring. There was a company appointed to investigate the possibility of constructing a canal. I think I convinced them that it would be a good thing to straighten the Sacramento River.

Q. What, have you to say of the timber land?—A. The timber land is used for mining purposes; outside of that it is not being injured. Of course it could be sold.

I wish to say a word in regard to the ground that is taken up for hydraulic purposes. According to the present law a man can pay $40 and have his land surveyed, and let it lie without paying or working it, and while it is in that condition he pays no taxes, while land alongside of it does pay taxes. I think something should be done to make those people obtain title to their land. They dig pit-holes and call that an annual working, and that is the improvement that they put on it. I would compel men to pay just as soon as the survey could be made. The present system encourages people to hold the land idly for a long time. Now, with regard to the tailings which come from these mines. Where a man uses 2,000 inches of water, if he has a good grade he can run off eight yards of gravel to the inch of water per day of twenty-four hours, so that he would wash away 16,000 cubic yards a day, and that fills up a great deal of space. Of course, instead of reaching the bay it reaches some partially flat country, and lodges there and fills up its depressions.

Q. Can any method be provided for taking care of these tailings?—A. I have had some experience, while mining and farming in Trinity County, in that respect. A man worked some ground back of me and built large dams, and held the tailings for years. Now, where I am mining at present, from the bed rock to the old channel, and down the present stream, it is 1,800 feet, and in a space like that you can understand that an immense amount of tailings can be deposited; dams can be made simply by laying brush in the channels for carrying off the waste water, and as the water passes through the hard material is held there.

Q. If these accumulations of deposits are made in this way will they not subsequently be broken up by the channels of the streams, and go down very slowly, and spread over the agricultural lands?—A. There has been very little of that damming done, and I think they would hold there. I think it would be a complete protection for the country, for a long time at least. They had a flood in this State in 1862, when all the streams overflowed. I had a farm at that time, and the farm was overflowed; the water left a sediment on the ground from 2 to 10 inches, and I found it of great advantage to the land as a fertilizer. Of course, if it had been heavy sand it would have injured it. That flood was widely spread all through this State. If the mines were stopped at the present time Marysville would be worse off for the first few years than it would if mining continued, for this reason: there are a great many dams built in the mountains to reservoir the water in time of flood—some as much as 100 feet high—and they run back for hundreds of acres and hold the water back from running down the natural channels in times of flood. If mining was stopped all these obstacles would be abandoned, and where the Bear and Yuba are now filled up this *débris* would come down and bury Marysville up in less time than the mining would. There might be large places set apart for the water to flow on, and by building dikes it can be kept in place. There is water enough held to run the mines through all the season. After they stop mining from the natural flow of water until the water comes again, the water they use is taken from supply held by reservoirs. There is a great deal of capital invested in the construction of reservoirs—there is one that cost $200,000. I propose building one myself 100 feet high. I regard hydraulic mining as being in its infancy. I think there is as much gold in Forest Hill Divide as all that has been taken out in California up to this time. Of course it will never all be taken out, but it is a thing that will always be a source of income.

Q. How do you obtain title to the water?—A. Formerly all we did was to go and dig a ditch, and we were not limited as to its size. Our system then was, no matter how much water you carried from a stream, you held that right if it was three times as much as you wanted to use. By an act of Congress, which says that in taking up water you shall first put a notice on the ground where you wish to divert it from the stream, saying how much water and under what pressure, and by what means, and to what points it is to be carried, and for what purpose, as soon as you place that notice there you then have to get that recorded in the county in which the water flows. If the water is in two counties you have to record it in two counties, and you must commence work in sixty days. If you don't your right is gone up; and you must finish and protect your work within a reasonable time.

Q. Do you all believe that you can "float" your rights?—A. That is the decision of the courts, provided you do not interfere with any accrued rights. If a man had a right above you which he had had for a long time it would be a hardship on him to take it from him. You can move your water as long as you do not injure him. Most of our laws governing this matter are court-made laws, most of them being decisions of the supreme court. If we have a new case that has not been before the supreme court, we don't know how it is to be determined until it gets there. The supreme court has held that when a man has had undisputed possession of his land for five years that he can hold it as against any one else. If a man has occupied his land for five years without any other counter-claim he could not be disturbed. Our statute of limitation is for five years.

Testimony of O. H. McKee, San Francisco, Cal.

SAN FRANCISCO, *October* 15, 1879.

O. H. MCKEE, attorney-at-law, made the following statement:

I would say that I have had a great deal of experience in mining litigations, including titles to mines in California, Nevada, and Utah. I had charge of the mineral branch of the General Land Office at Washington until 1872, before coming here. Since that time I have been practicing law here, so that I have had an opportunity to see the administration of the mineral land laws in Washington as well as here, and I would give it as the result of my experience that the present law does not work satisfactorily and is by no means free from difficulties. I am decidedly of the opinion that if we were to start anew to dispose of the mineral land it would be better to adopt the square location with vertical side lines. Under the present law the right to follow the dip or lode has given rise to such needless litigation that many claimants are ruined, even though owning valuable property, by becoming entangled with the claims of others, and the law, although entitled "An act to develop the mineral resources of the country," is, in some respects, a misnomer. Of course in old districts the beginning now of the square system of location would be attended with a great deal of difficulty. It would be different from a new district, where everything would be clean from deep

locations; though square locations might be made in the old districts, of course subject to the vested rights of parties who have filed locations, whether patented or unpatented. In new districts I think it would work admirably, and give greater confidence and security to the prospectors and investors in mining claims. With regard to the size of locations I should judge that they ought to be about forty acres in area, which would be 1,320 feet square. That is nearly double the present size. Again, there are difficulties inseparable from the manner of locating the claims at present—the maintenance of claims in outlying districts which are in charge of a recorder who may be irresponsible, indiscreet or indifferent, or who may be even in some cases corrupt, where under the fee system he would be induced to allow relocations of the same ground merely for the purpose of obtaining additional fees, until the whole district would be in a tangled-up mass from which it seems impossible a man could free himself. I would recommend that every United States land district in which there are minerals be subdivided into mining districts and mapped off. For example, the Bodie land district could be divided into three or four submineral districts, each with a United States deputy surveyor, who should be surveyor and recorder, to be paid directly by the government like other officers, or by fees to be arranged as Congress might direct; that the district surveyor or recorder shall survey the claims and see that they do not overlap, and shall furnish the register and receiver of the land district with a monthly abstract of all locations of surveys made, so as to perpetuate the record and also for better security. With regard to obtaining titles from the government, I think it should be mandatory upon miners after their locations are surveyed and recorded to initiate proceedings with a view to obtaining patent and paying the government an acreage. There is a question upon which I am hardly clear in my own mind, whether we should compel them to institute proceedings for obtaining a patent within a certain given number of months after their location, or whether they should be compelled to institute proceedings for a patent in every instance as soon as the claim has produced a given amount.

Question. Would you not also have a limitation when they should pay up on placer claims?—Answer. I would apply this to all mining lands. The present law providing for the sale of quartz veins by the acre never was to my mind a proper one. In the first place the government would get more in the way of revenue from the sale of claims that were practically worthless than out of those that were of enormous value. I think that even under the present law claims should be sold by the linear foot. Take, for example, a claim of 1,500 feet. If the government price was 50 cents per foot they would receive $750 for the claim, and also something for the adjoining surface. However, they did not do that, but just enacted a law providing for the sale of quartz lodes by the acre. I think the district organizations, which receive a sort of quasi recognition by the law of Congress, should be abolished, and the government take entire custody of the matter of mining claims right from the initial point up. Furthermore, I think it was certainly a mistake to surrender the jurisdiction of the district land office in the case of contested mining claims to the courts. I am unable to see that it has expedited matters or that it has cheapened justice or been of any benefit. The questions that arise are nearly all questions of fact, and they can be just as well determined before the register and receiver whose attention is entirely confined to land matters as before a court whose time may be taken up by a thousand other matters, and jurors who may have but little interest in the case. I favor the immediate restoration of that power to the district land office. Now, in contested cases, the matter is referred to the court and the government is unable to do anything with regard to its own property until the court may determine what shall be done. I should be in favor of the restoration of a jurisdiction to the register and receiver, acting as a court. I would have the whole matter come under them. Of course I would not approve of any legislation that would interfere with any vested rights.

Testimony of R. McMurray, San Joaquin, Cal., relative to timber and mineral lands, placer claims, title, tailings.

R. McMURRAY, San Joaquin, October 24, made the following statement:

I have lived here twenty-seven years; am familiar with the timber land in this county, particularly on this ridge.

Question. What class of timber have you here?—Answer. We have, or did have, land heavily timbered with sugar-pine, spruce, fir, and oak. A portion of it is still heavily timbered. Lower down the timber is lighter and of a different character from that above, and not so well calculated for milling purposes as the timber above. This section of country has been heavily timbered, but you see the condition of it now.

Q. To what extent has timber been wasted?—A. I have known of millions of feet

of sugar-pine trees from 100 to 150 feet in length that have been cut down, with only 50 feet of it used, and that is carried on to a certain extent at the present time; and we have little sugar-pine left except that which protects itself by being in the cañons, where it cannot be reached, and a great deal that is being cut at the present is cut by those who are making ———. They will cut down a sugar-pine which has 20,000 feet of lumber in it, and perhaps use only 20 feet of timber; and sometimes when the tree doesn't contain the right kind of timber they will leave it and cut another. I do not think there is such large timber destroyed by fire that has been represented to you usually; it is small timber that is destroyed by fire frequently. You will see large trees, but not often.

Q. What effect does the waste of choppers have upon fires?—A. It has a very injurious effect. Judge Stiger said it adds fuel to the fire; and wherever there is a number of trees cut near each other the trunks and limbs left have destroyed the large timber, because it makes a large fire.

Q. In your judgment, is heavily timbered country of much value for agricultural purposes?—A. Some portions of it is valuable, but that portion upon which the timber is left now I do not think is valuable for agricultural purposes because of the great altitude; the season is very short, in fact forever snowing, and, I was going to say eight months in the year, but they have it six months at least, and it would be of no value, except for grazing purposes and lumber.

Q. What land system could you suggest as being advantageous and preserving the timber from wanton destruction, fires, &c., and still leave it open to legitimate industries?—A. I do not know any better way than having it owned by individuals. I am inclined to think it would be a better plan, and particularly where the timber is used where there is a market for it; and I think if the timber land that is left now was sold, allowing individuals to get title to it, it would be very much better for the land, and the government would realize what is paid for it. It sometimes costs $10 an acre to get this land. If I want a piece of land of 160 acres, I would go live on it. Myself or some other person must go do it. I will have to get a purchase title for him. A pre-emptor can live on the timber land if it is valueless except for the timber. I think if there was a law by which you could go on a piece of land and obtain title in sixty days, I think it would be a benefit to everybody and a benefit to the timber. The condition of the timber at present is such that a small quantity of the land would be of no value, because it is generally in the cañons or on the hills, where it does not pay to go for it; unless you could purchase 640 acres, it would be of no use to you, but would be expensive above the milling and the hauling of these logs to the mill. In this section of the country roads would have to be constructed before any hauling the lumber out and getting the logs to the mill. Our hills are very steep here, and it would cost a great deal of money to build roads.

Q. What do you think about continuing the reserving of the mineral belt?—A. I think it most certainly should be done. It is protection to the mining interests, and I think that it is greater than the advantage would be to the agricultural if it was thrown open, because the local laws prohibit a location to such land as would be sold for agricultural purposes. If it was allowed to go on, I think it would be very detrimental to the mining interests. It would throw this mineral land into the hands of monopolists and grabbers, and they would buy it and hold it. The agricultural interest is such that they must prove this mineral off before they can purchase it. I think this reservation is very beneficial.

Q. How do they prove it off?—A. They take the proper evidence before the Land Commissioner and prove that it is more valuable for agricultural purposes than it is for mining purposes.

Q. How do they prove there are no lodes in it?—A. They only know that there are no evidences of lodes in it. I believe that all that is required under the present laws is proof by *ex-parte* affidavits.

Q. What have you to say about the *débris* question?—A. I hardly know what to say about it. It comes too near home whether lands where the coarser material (gravel and sand) could be dammed above the valley lands that are cultivated. That I cannot state. I think there is very little of this coarser material that reaches the valley land; that is, the lower portion. There is very little of this coarser material which reaches Marysville.

Q. Is there much sand?—A. I have never examined it to see whether it was slickens or not. It always appeared to me to be a lighter material.

Q. To what extent are the lands above the valleys in the hands of the government, and to what extent have they been taken up by individuals?—A. I presume nearly all tell you, "Go to the foot-hills"; that has been my impression about it. Except the red lands below Smartsville, I always supposed that the lower lands and valleys have all been taken up.

Q. Are any lands benefited by slickens?—A. I think the red lands outside of Smartsville would be benefited by it.

Q. The injury which they claim, was it a permanent injury or a temporary one?—

A. They claim it is permanent, but I cannot see it in that light. We have, for instance, reservoirs where the same material has been deposited, and we have one of them to-day that can raise hay and clover as well as any land in this section of the country. They can raise three crops a year where this same material is deposited, but it has lain there some years before it was cultivated.

Q. What do you think of the propriety of limiting the time in which a man can acquire title to his claims in placer mines?—A. I think it would be a great advantage. For those who locate for an honest purpose I think it would be beneficial; for those who locate for speculative purposes, of course it would be a detriment, and that class of people we are anxious to discourage. For the general interests it would be advantageous to let them acquire title without expending the money that is now required. They now have to make affidavit that there is $500 worth of work expended on that claim. Frequently all the money is to be expended to no purpose; that is one reason why many of these mining claims have not been opened. For instance, a man will locate between two hills or mountains; there is no outlet from which he can wash his mine; he must lay on his claim until he can get enough land to justify him in making an outlet, and if he wants to acquire title to it he cannot do that until he has expended $500. If he desires to acquire title he must expend $500, which may be of no value to the mine. After it is opened the investment in the development of a mine is great, from the fact that long channels have to be driven to get an outlet for their tailings; then there is iron pipes for hydraulic purposes, flumes, &c.

Q. Can you suggest any practical remedy for the tailings?—A. I have noticed here so many plans that I would not undertake to improve upon them. I have listened to Mr. Von Schmidt and others, and it seems to me that the plan the most practical is that of Mr. Von Schmidt; that is, to dam a sufficient portion of land, to be used as a dumping ground; a territory that Judge Stiger suggests would hold all the tailings; while, on the other hand, to dam the upper portion would deposit the tailings on the red lands. I am quite certain it would be beneficial to the lands and make them very valuable, and probably pay the expenses of doing it. The farmers ought to find some plan for disposing of them. I do not know any better way than to have the protection come from the government.

Testimony of H. A. Messinger, Campo Seco, Calaveras County, Cal.

Hon. H. A. MESSINGER, of Campo Seco, Calaveras County, California, testified at San Francisco, October 14, 1879, as follows:

I came into Calaveras in 1852 and have been living there ever since except two years. I have been engaged in farming and mining—all kinds of mining except quartz mining; and have been engaged in the stock business.

Question. How can the timber be best utilized by the people and preserved from destruction?—A. In my opinion the only way is for the government to dispose of it to private owners, and they will protect it the same as they would their own interests. Much of the timber has been disposed of under the pre-emption and homestead laws—as much as it would pay for people to enter. It is a mistaken idea to suppose that Calaveras County is covered with timber. The timber of the foot-hills consists of oak and pine. It has been destroyed and consumed by miners and ranchers. The second growth that is now springing up is being destroyed shamefully. The people go and cut second growth oak from 3 to 6 inches through, and it takes a great many of them to make a cord. Where this second growth is cut off (and it is the same way with pine where it is cut off) there is very little chance for a third growth to sprout or come up, because the young trees are not at an age to produce seeds. This is the experience of those who have Colorado pine lands. After the second growth is cleared off there is never any third growth to amount to anything. The land should be sold in tracts of sufficient size to warrant a man in putting up saw-mills.

Q. Why not sell this land in quarter-section tracts?—A. That is a good idea. I should limit a man to a certain amount, though a quarter section is not enough for milling purposes. Sometimes there would not be 40 acres of timber land on a section.

Q. Do you use irrigation in your county?—A. We use irrigation to some extent—it is being practiced more every year. In the eastern part of Calaveras County there is as good land as there is in the State. It produces crops without irrigation, though if you irrigate the land it does much better. You can cut five crops of grass a season where you have irrigation. We raise wheat and barley now. We sow early in the winter after the rain has fallen sufficiently to keep it alive. We sow our wheat and barley from the 1st of December to the 1st of March. That which is sowed late we take chances on. We do not expect rain much after the grain has got to growing well, after about the 25th of March.

Q. How can the government dispose of those lands that are irrigable lands, that

can't be cultivated without irrigation, in such a manner as to induce settlement?—A. I think in nearly the same manner as timber lands—in large quantities, so that when it was actually needed by individuals they could go to work and bring in ditches. I do not think the government nor the State has any right to enter into irrigation enterprises.

Q. How would you dispose of the pasturage lands?—A. The only thing that interferes with pasturage or grazing land is the mineral.

Q. Are there not pasturage lands that have no value except for pasturage purposes?—A. Yes, sir; there is a great deal of such land.

Q. How can they be utilized?—A. By cash entry. That would be the simplest way. This trying to compel a man to reside upon land upon which he can't make a living is the greatest piece of folly in the world; it submits him to so much expense without any good results.

Q. Suppose he could homestead a sufficient quantity of land for a pasturage farm?—A. Well, there are two classes of pasturage land. The sheep men and a great many cattle men are so situated that they have to take their stock to the mountains, and, as a general thing, away above these timber lands in the summer. The difficulty is the land could only be sold in quantities to suit herders who own stock. They can't make any residence there. The land is claimed now, and they recognize each other's rights, which are not now disputed, if they go into the mountains and stay five months until the snow falls. That land will never be useful in any way except the way they use it now, and a great deal of it is above pine timber. Take the whole range of pasturage lands, which is situated along the foot-hills. I think the intention of the government is to dispose of it to actual settlers as soon as possible. I think it ought to be done with as little inconvenience to the settlers as possible.

Q. What impediment to the prosperity of the country is there in the fact that these pasturage men do not have titles to their homes?—A. All that they have now is simply a possessory right, and if they were compelled to buy the land a great deal of this land would be bought. Of course it should be sold at a low rate. My object would be to get this land question into a shape so that we could collect a revenue from the men who are occupying the land. We think if a man uses anything he ought to own it.

Q. In your experience are not the high valleys apportioned out and kept by herders who recognize each other's rights and understand that the use of the land belongs to them, but they do not pay any taxes?—A. That is the case. Most of the land has been sectionized, but a great deal of it has not been surveyed.

Q. What is the principal value of the foot-hills?—A. Undoubtedly the foot-hills are principally valuable for mines. If we had no mines they would have no market, and all that the people living in them could do would be to eat what they raised. There is no doubt but that mining is the great interest in our part of the country, and the mines are certainly in the foot-hills.

Q. Would you sell the foot-hills for agricultural purposes?—A. That is a very hard question to answer. Sometimes I think it would have been better if the land had never been thrown into the market at all. My opinion is that it would be well to give title to those who now live on those lands, reserving the rest for mineral purposes, or else sell it out at cash entry and give a man a title to it. If $1.25 per acre is not considered enough for it, sell it for more; but when he bought it let him have a clean title to it. The foot-hills are good orchard and grape lands.

Q. Are you familiar with placer mining?—A. Yes; I have worked placer mines. My opinion about the *débris* question is simply this: the agriculturists bought their lands since mines were discovered and worked, and having bought the land at their own risk, knowing the consequences, why should we bother ourselves about it? Can a man go and buy a piece of land with another working on it above and after he gets his title tell the other man to stop working? We certainly should not wish to stop all mining for the little damage that may be done to the few farmers below. I do not see how it can be made our part of the business. Water will run down-hill and take the dirt with it. I do not think there would be much more destruction by continuing the mining than there has been already. Of course large tracts of land have been rendered almost worthless by being washed over, but, as a gentleman testified this morning, as all the gulches are filled up it would not make any difference in the future. I do not see how the government can do anything about it; it is a question which the State will have to settle.

Q. Does the making of non-mineral proof work a hardship on the agriculturist?—A. The making of non-mineral proof works a great hardship upon persons who wish to take up non-mineral land. We went on our land in good faith, and when we made our proof we then received a notice that more non-mineral proof was required. This placed us under an additional expense of $50, and no good can result from it whatever. It takes just that much money out of our district, and is of no benefit to any one that we can see, and we feel that we have been wronged. There may have been mineral land obtained for agricultural purposes, but where that has been done it is very easy for a man to file an affidavit showing that there has been fraud committed in certain

cases, and then proceed in the same way as in other cases of adjusting difficulty between farming interests and mining interests. Suppose, for instance, I own 160 acres of land to which I have an undisputed right; some man comes along and discovers that he may make a few dollars mining on it; all he has to do is to come to me and say, "I want to mine on this land and I will pay you for any damage I may do." These are the men that have caused all the trouble. No one is going to run against his own interest and say, "No; this gold has got to lay there, and nobody shall get any good from it."

Q. Would not you, as a remedy for that, say that when a man comes to prove up on a piece of land at the land office he should furnish the proof of its non-mineral character, and having furnished that, and having satisfied the register and receiver and the Commissioner of the General Land Office, should not his patent give him an absolute right to everything from the center to the circumference?—A. Yes, sir; I believe a man should buy from the surface to the center of the earth; but where there are quartz or any other mines on that land I would recommend that when the mines were surveyed it should be in the form of 10 or 20 acre blocks, or in some way so as not to have any fractional parts or diagonal lines running across the land, cutting it up into such shapes that you don't know what is left. I know one man who has a copper claim running across a portion of 40 acres, which renders the land on both sides valueless for anything else. Another thing: A gentleman this morning was speaking in regard to surveying. Of course, in surveying over hilly land it is almost impossible to make an accurate survey. Suppose a section-line ran over top of a mountain on to the other side; they would not make an accurate measurement by 20 rods. It is very difficult to do that, and how are you going to do it? They should be liberal in setting their stakes, and when a stake is set it should remain there under all circumstances. I think where it is surveyed for 160 acres it should always be 160 acres. These corner-stakes are set up in the most trifling manner. When you want to get your land surveyed it will cost you $20 to find where that corner-post was, though it has not been surveyed ten years. There should be a mound made or some permanent stake fixed.

Another thing of which I should like to speak is the timber-land homestead. Now it requires a man to plow and plant a certain number of trees every year. That, I think, should be construed to mean that where a man filed on a timber-land homestead if he would protect the young growth that is on the land for a certain length of time it should operate the same as though he had planted. If that act were construed to mean taking care of the young timber growth, why would that not be just as good as planting the trees? Almost all the foot-hills will grow up in timber if it was protected.

Testimony of N. C. Miller, San Joaquin, Cal.

N. C. MILLER, San Joaquin, October 24 (lives at French Corral), made the following statement:

I have lived in the State since April, 1850.

Question. Are you familiar with the timber land of this country?—Answer. Only partially so.

Q. In your judgment what system of disposing of this land would be the best for the protection of the timber?—A. I am inclined to think that the system of private ownership would be the best as it stands now. Perhaps it would have been better if it had been earlier put in force.

Q. What limit would you place on the amount of the land sold?—A. I should think that as far as the timber is concerned, and of the kind to be called timber land, that a square mile would be as little as anybody would wish to look after. If they wanted to put a mill anywhere for the purpose of milling, a mile of the timber would not answer the purpose.

Q. What do you think of the policy of reserving this belt of mineral land?—A. It seems to have worked so far, and I think it would be well to continue it.

Q. You are familiar with this question of the *debris*?—A. I am as familiar as every person interested is. I read everything that is published on the subject.

Q. To what extent are the agricultural lands being damaged?—A. It appears to me that a large portion of the damage is already done. A little narrow belt of fertile land along the Yuba and Bear Rivers has been covered, now off. A large portion has been covered here on the Yuba; they are protected, some portions of it. They have made a large dumping ground of a large area down toward Marysville. It does not seem to me that we will trouble them very much more from the Yuba. I do not think there is near as large an area of mineral land on the Yuba washed as a great many of the agricultural papers seem to think. There is a larger proportion gone down now than what they seem to carry in their mines. Some of them seem confined to the idea that

the whole mountains are going to come down, while it is only a very small portion, comparatively, that can be sent down.

Q. Can you suggest a remedy?—A. The remedy that Mr. Von Schmidt suggested seems to me to be feasible; that is, to build brush dams in the cañons to retain the heavier portions there, then to take the silt or sand or slickings, or whatever you may call it, on to this red land that lies back of Smartsville, and endeavor to keep as much from coming below as practicable; then there are large swales where there are dumping grounds for all of the sand that would be sent down for any length of time.

Q. What is the character of this red land?—A. They afford pasturage to the stock in the spring, and after that they don't seem to be of much value.

Q. Can they raise grain upon them?—A. I think they could if they had water and a top deposit. I do not think they can raise grain upon them as they now stand. They appear to be a kind of clay, not fertile at all, but still if they are stocked with water during the winter, when the spring opens there is enough grass that grows upon them which if not eaten off too closely affords good pasturage for a short time. If these tailings could be turned upon them they would be beneficial to them, and I think it can be done. The swales might have brush dams constructed, and these would strain the water. It would not raise the bed of the river, but turn the bed of the stream. I think by building ditches we might take care of anywhere from twenty to fifty thousand inches when there is that much water. As a general thing there is not more than ten thousand inches altogether that comes down the river. The coarser *débris* should be held back along the dumping ground.

Q. Would not that raise the bed of the stream considerably?—A. I do not think it would injure the stream at all. It would quicken the flow of the river in places.

Q. Would not that increase the transporting power?—A. It would increase the transporting power for a distance, but wherever it came to a flat place it would deposit again. If there were dams put in where the dumping places are, or near where they are, I think they might be made of brush that would stand and bring the tailings right onto the dumps.

Q. To whom does this land in the mountains belong?—A. I think it all belongs to the government or the railroads.

Q. Does the railroad land extend as high up as this?—A. Yes; they extend west of here to the other side of the river. The Oregon Railroad grant does not extend so far as this, but this is the Central Pacific grant.

Testimony of John W. North, attorney-at-law, San Francisco, Cal.

To the Public Land Commission, Washington, D. C.:

GENTLEMEN: I have the honor to acknowledge the receipt of your circular containing questions in relation to land entries, &c. I will attempt a reply to a few of them as to obtaining title:

To the questions propounded I will reply in their order as numbered:

1. My name is John W. North; residence, San Francisco; occupation, attorney-at-law.

2. I have lived in the State of California nine years, and all that time at Riverside, in the county of San Bernardino, until I came here three weeks ago.

3. I have sought to obtain title to 100 acres of government land at Riverside for the past nine years. I made a homestead claim and settlement on said land in September, 1870; built a house and moved into it with my family in November of that year, and have resided there ever since; my family are still there. I expended on that claim $6,000 prior to the government survey, which was made in the spring of 1878 and showed 23 acres of my claim to be an odd section. I was on this land nearly six months before the railroad grant passed Congress, yet the department gives the best part of my claim to the railroad, and rules out my whole claim, including 77 acres on an even section. The ruling in favor of the railroad as to the 23 acres is made to defeat my entire claim, including the 77 acres on an even section. My long residence on the land and valuable improvements seem to have no weight with the Commissioner. This case suggests several wrongs which should be remedied.

1. Homestead entries should not be confined to "*surveyed lands*" any more than pre-emption entries. Homestead claims should date from "*the first act of settlement*" as well as pre-emptions.

2. A prior and *bona-fide* settler should not be allowed to be ousted by a subsequent settler or by a railroad company.

3. The government should not forbid a man to file his homestead claim until the survey, and then oust him because his claim was not filed prior to a railroad grant. In my case I cannot pre-empt, for I have once filed a declaratory statement. My homestead

claim is ruled out by the Commissioner, and the land is not subject to private entry, I am therefore excluded from obtaining title.

4. I have had some opportunity to observe the working of our land laws during my residence in Minnesota from 1849 to 1861. Also, as surveyor-general of Nevada in 1861 and 1862. Also as attorney in most of the land cases in San Bernardino County for a few years past.

I have resided on the frontier more than twenty-five years, and during that time I have been strongly impressed with the fact that our land laws, instead of being a protection to the government and to honest men, offer frequent inducements to perjury, which are very frequently improved. As an illustration of this I will state that while riding over the ground where the city of Minneapolis now stands I was shown a claim shanty which was set upon an ox-sled, and which had been hauled about from claim to claim for different claimants to swear by, they making up by hard swearing what they lacked of a compliance with the law.

5. My personal experience with land cases in the county of San Bernardino has been this: In the summer of 1870 I organized a company that established the colony of eastern people at Riverside, in that county. We took a dry and worthless plain, and by conducting water upon it made it habitable. Settlers who came there in November, 1870, and some of them soldiers in the late war who settled on government land have been trying from that day to this to obtain title, and those on odd sections have not yet succeeded. They would have pre-empted the first year if the law had permitted. But—

1st. There were ranch lines to be settled before the township could be surveyed. The government, instead of settling those lines, left them as open questions for more than twenty-five years.

2d. This gave opportunity for many corrupt schemes to change lines for the advantage of designing persons. So *bona-fide* settlers had to delay all improvements, or improve at a risk, while capitalists played with the claim. The same expert was sent down from the United States surveyor-general's office, as he himself informed me, four times to report on those lines, and I think he made a different report every time, as he was sent down by different surveyor-generals and on the application of different parties in interest. The settlers had to wait during this protracted game, and at last were obliged to incur considerable expense in order to prevent the sliding of the ranch lines over their improved claims. After about eight years the lines were settled so that our township could be surveyed. Then the settlers filed their claims at once, and since the 1st of July, 1878, have been trying to obtain title. Most of them are waiting still, and near a score of their cases are before the department in Washington.

All who are on odd sections are decided against, notwithstanding the fact that they were on the land before the railroad land grant passed Congress. They then appeal and wait. Many common-sense men think it would be better that the first presumption should be in favor of the *bona-fide* settler, and that he should be permitted to proceed at once before the local land office to prove his claim, and, if he showed clearly that he was a *bona-fide* claimant, let him have his land without subjecting him to the hardship of waiting for years, and in addition to that having to spend the price of his land in fighting a powerful company.

6. Out of my numerous clients I will name one, H. M. Streeter, an excellent citizen, who has just been elected to the legislature from our county. Sturges Lovell, a soldier in the late war, made a pre-emption claim to 160 acres of government land in the autumn of 1870, about four months before the railroad land grant passed Congress. About four years ago H. M. Streeter obtained from him 80 acres of this land, on which Lovell had resided constantly up to that time. Streeter has made valuable improvements and has resided continuously on the land.

The law of April 21, 1876, provides for exactly such a case as this, and we hoped that Streeter would not be delayed at all. But he was met promptly by a ruling against him at the local land office. He then appealed to the Commissioner, who, after some eight months' waiting, decided against him, apparently overlooking the law of April 21, 1876. He then appealed to the Secretary of the Interior, and has had to employ an attorney at Washington. There his case remains, while he, a poor man, has been on the point of leaving his claim, with his orange trees almost to bearing, and going back to Massachusetts. From present appearances his claim will cost him, even if he succeeds, a large share of its value in getting title from the government. This is but one case out of near a score in that county where the same experience is had, under the same circumstances.

Another quite common case is where joint entries are to be made, and where there is entire agreement between the parties; no conflict whatever. These cases, which any local land officer ought to be able to decide in five minutes, are all sent to Washington and delayed as long as the others. These are cases on even sections, where no railroad claim comes in.

Another delay and expense is caused by the law requiring every claimant to advertise before proving up. These vexatious contests, delays, and expenses do much to

irritate the people against the government, the administration, and the officers of the Land Department. One of these claimants said to me a few weeks since that he would prefer to buy land at $75 per acre, where he could get title at once, than to undertake to get title from the government where he could get the land for nothing.

Such circumstances as I have narrated have long since forced upon me the firm belief *that it would be infinitely better for the government and the settler, and also for the development of the country, to repeal all homestead and pre-emption laws and open all public lands to private entry, restricting the amount each individual can enter. And the rights of the settler should be as sacredly guarded on unsurveyed as on surveyed lands.*

When the government permits a man to settle on unsurveyed land, it should not then give that land to another party.

The 7th, 8th, and 9th questions, under this head, I leave to others.

To the 10th question I will answer briefly.

10. My ideas under this head are anticipated in what I have just written. The object of the government should be to enable the *bona-fide* settler to obtain title as speedily and as cheaply as possible. Under the present system numerous difficulties, long delays, and expensive contests are, to say the least, quite too common. Our laws under which the settler must obtain title, if at all, have been so often amended, added to, and qualified that they have become hinderances rather than helps to the honest, straightforward settler in his efforts to obtain title. The very object of the law itself seems, in many cases, to be lost sight of, while technical difficulties are multiplied.

For these reasons I think the attention of the government should be directed to an effort to make it as easy as possible for the settler to obtain title before he invests all he has in improvements on land that may never be his.

I think it would be advantageous, both to the government and the settler, to repeal both the present homestead and pre-emption laws, and offer all lands at private entry, to actual settlers, in such limited quantities as shall suit the various wants of the settlers, giving to the settler a reasonable time in which to pay for his land, provided he lives on it and improves it, but giving to the first settler an *absolute right to purchase, without hampering him with any disabling laws.*

Very respectfully, your obedient servant,

J. W. NORTH.

SAN FRANCISCO, *October* 9, 1879.

Testimony of Judge J. W. North, San Francisco, Cal.

Judge J. W. NORTH testified, October 7, 1879, at San Francisco, Cal., as follows:

I have lived in the State since 1870. In the lower part of the State some portions of the land which have been heretofore regarded as not susceptible of cultivation without irrigation are being found to be susceptible by more diligent culture. In that portion of the State lands that seemed to require irrigation near the coast, where the moist winds and fogs are very frequent, are found to need very much less irrigation than back fifty miles or so from the coast, where the winds become dry.

At Riverside, where I resided for many years, irrigation is much more needed than in Los Angeles County, where they seem really to need little irrigation. Most irrigation is needed when the lands are exposed to dry winds, which seem to absorb the moisture into the atmosphere much quicker than where there are fogs.

A large proportion of the lands that are irrigable can be irrigated by the mountain streams. The expense of irrigating the land varies according to the distance that the water has to be conducted in irrigating canals. Some of the lands that are apparently easy of irrigation when you get the water to their vicinity are very expensive to irrigate, when you take into consideration the expense of bringing the irrigating canal to where it can reach them, and consequently you cannot state precisely how much different lands will cost to irrigate; because the expense of getting the water to them varies widely.

Question. Have you any suggestion to make concerning the destruction of timber?—Answer. I think the destruction of timber is general and wanton. I think there should be some effort on the part of the government to restrain it, and take means to protect the timber from destruction. It is being destroyed very rapidly and very uselessly. There are two sources of destruction; one by cutting, and another by fire. The first one is caused by neglecting to survey and sell the land so that persons could go on to the government land and get what they wish. There would then be no necessity for destroying the timber. A large share of the timber that is cut down is left to decay upon the ground; while if the lands that bear the timber were cut up and sold, without great difficulty in obtaining title—if it was made subject to private entry at once and sold to the people who need it, and who would be glad to pay a fair price for it—the timber would be protected and taken care of.

By the policy that has been pursued for a number of years, the timber is being destroyed very rapidly. I will illustrate: Take the State of Nevada. I was appointed the first surveyor-general of that Territory, and while there had never been any public lands surveyed at all in the Territory, I was instructed by the Commissioner of the General Land Office to prohibit the destruction of the timber on the mountains. I endeavored to make the Commissioner understand that that would be wholly impossible; that while every settler was a trespasser the government had recognized their title, and that towns and cities had grown up, mines were developing, and that the timber taken from the mountains was indispensable to the various industries there.

I went so far as to tell him that the office which I rented—the very table upon which I wrote—was the property of a trespasser. It was wholly impossible to exist here without it; but I could not make the Commissioner appreciate that fact. The destruction of the timber went on. I might say that three-fourths of the timber upon the government land which might have been sold for good prices was never purchased, and the government did not seem to take into consideration the fact that these lands ought to be sold so as to facilitate mining and to develop the resources of the country.

I speak of that as an illustration—simply of what has been done in the past; and to illustrate my idea of the importance of throwing open these lands to private entry in a judicious way, limiting the amount of land that an individual can purchase so monopolists would not monopolize the entire country.

I want the people that need the timber to get it. The title should be obtainable in the easiest manner possible, and it should be open to private entry, setting a limit as to the quantity, so as to prevent monopolists from taking it all.

I know that fires would be prevented if the land was owned by individuals.

B. B. REDDING. I can state that *Pinus lambertiniana* (sugar-pine) is the most valuable timber in the Sierra Nevada Mountains. It grows at an elevation of not more than 7,000 feet. It is used for finishing houses. It is shipped abroad for use, even to South America. It is a large tree, and never grows in forests by itself. It has the peculiarity of growing among other pines sparsely, not in forests. It never grows in clumps by itself. Probably in 100 feet square there would be one tree, and the next 100 feet square there would be another tree. It is largely used for what we call shakes; they are a kind of shingle.

There are a class of men who traverse these mountains; going through the mountains and finding a large and apparently free-splitting sugar-pine tree they fell it, making one cut from the butt, and if it splits freely into shakes, th ey probably get two cuts out of a tree; if it does not split free, they leave it on the ground to die and go and hunt another. That tree, if made into ordinary lumber, in this market sells for from $40 to $60 a thousand. It is the most expensive wood we have. These trees are destroyed yearly by the thousands, and left to rot and waste on the ground, for the sake of getting two cuts off the butt for making shakes. That should be prohibited, if possible, for that destruction of our most valuable tree goes on at an enormous rate.

Mr. WORTH. I have observed that same thing.

Q. Are the timber lands that are high on the mountains available for agricultural purposes?—A. They are of no value for agricultural purposes. Their principal value is for timber; only they use them somewhat for pasturage purposes. In these timber sections there will be some small sections of pasturage land, as in the San Bernardino country. There are some small valleys for pasturage purposes and some marsh lands, but generally they are valuable only for timber.

Q. Are these timber lands available to poor men as agricultural homesteads?—A. They are not. The men who go up into these mountains for lumber uniformly suspend all operations during the winter and go down into the valleys, leaving only one man to look after the mill during the winter.

Q. I understand you to say they are valuable for timber purposes only. Could they be owned advantageously in small tracts of, say, 40 to 80 acres by men who have agricultural farms on the streams?—A. I think not, for the reason that the men who go into the mountains for timber would need larger tracts than 160 acres; and if they were not able to get that, they would be likely to cut the timber from off those portions which were owned by the farmers while they were at their farm-work. The timber lands are too remote, and they would not want to buy lands under these conditions. In many instances they would have to go from 20 to 40 miles to their wood lands and to which there would be no road, and roads could only be constructed by a combination of capital to get up to this timber land.

Q. What system of disposing of the timber lands would be most advantageous to the country—first, in the preservation of the timber; and, second, in the utilization of it by delivering it to the people who desire to use it?—A. I do not claim to have made the matter a profound study, but from information and the observation I have made, I do not think any system could be so well adopted as to let these lands be opened to private entry. I do not know that I would say in unlimited quantities; that would be infinitely better than the present system.

Q. Would you reserve the alternate sections in the hands of the government, for some

years, say?—A. The mere reservation, I think, would hardly keep up the timber as well as if it was owned by individuals. They would then have an interest in protecting it from fires and from depredations.

Q. What is the reason that timber must be owned in large quantities to be utilized?—A. A man won't go into the mountains and put up a mill to manufacture lumber and make that a business, constructing roads to bring it out, &c., if he could not have more than 160 acres. He must have land enough to make the profits commensurate with the money he has invested in the business. Take it in the San Bernardino Mountains. The base of the mountain is seven miles from the city. Then you have to go up the mountain (they are very steep and abrupt) for five or six miles; perhaps seven. It is a very difficult ascent and roads can only be constructed at great cost. The timber is on the northern side of the mountain, while the plains are on the other side, and there is no timber worth looking at until you go over the summit. The available timber is found at an elevation from four thousand feet and upwards. After the road has been constructed and the timber sent down (it is cut scattering) there will be a comparatively small amount to the acre as compared with other sections in the Sierra Nevada Mountains; so that to get a sufficiently large amount of timber to justify the location of a mill and the building of a road, it will be necessary to have thousands of acres of this timber land in order to enter upon the business at all.

Q. Would not the tendency be to have all this timber fall into the hands of a few mere monopolists, who do not care either to build mills or construct flumes, but hold the timber for a future great rise?—A. At this time I hardly think it would be, for the reason that these difficulties have all been overcome to some extent and the business is being carried on. The lands have been sold to some extent, and there is now no opportunity for such a monopoly. I question if a monopoly was attempted if the competition with the coast lumber trade would not prevent it, because now the price of lumber from the mountains is very little below the price of lumber brought down the coast. That would effectually prevent any monopoly of these timber lands. There is no parallel between timber lands on the mountains and on the prairies. It does not require a great expenditure to get out the timber on the prairie; not so much as it does in the mountains. In the mountains a man would only buy the timber to utilize the wood, but on the prairie a man cuts off the timber and still has the land.

Q. What is the extent of the timber belt in the Sierra Nevada Mountains?—A. The available pine land is about five hundred miles long, with an average width of thirty miles. That is the timber belt that is available for saw-mill purposes on the western slope of the Sierra Nevada Mountains. It is broader at the north, and narrows southward until it runs out into the San Bernardino Mountains.

Q. What land system can the United States adopt which will secure eventually the redemption of these lands and throw them into the hands of actual settlers? What are the conditions under which agriculture can be practiced?—A. While I have been in favor of the pre-emption and homestead laws, and have observed their practical operations, I am forced to the conclusion that the best method of disposing of the government lands—of all lands that are irrigable, especially those that require large expenditure of capital to bring the water to them—would be to make them subject to private entry; for while without irrigation they would be comparatively valueless, yet with irrigation they become valuable. In order to induce the requisite amount of capital to be expended for purpose of irrigation it will be necessary for the parties to get the land in tracts large enough to make it an object to spend the money requisite for the irrigating canals, and it will be infinitely better if the land were subject to private entry.

Many companies of individuals—say, for instance, a colony at the East—wish to come into this State and to find a place that can be irrigated by the expenditure of capital, and I speak of enterprises of which I am familiar; I know people that would be very glad, indeed, to enter the requisite amount of land capable of irrigation (these lands are now worthless) if they could get a title without difficulty and immediately, so that when they enter upon this enterprise they would know that they would be safe in so doing and not have a long and protracted struggle to get a title from the government. If they could get these lands at private entry, there would be thousands of acres sold by the government for actual settlement and improved by individuals, whereas now these lands are unoccupied and unimproved.

I think to have these lands subject to private entry would encourage settlement, would encourage colonies, and would encourage enterprise much more than it does under the present system. There is not the least danger that monopolists in this State would come in to purchase the land for the simple purpose of owning and controlling it for themselves and their children, but they would go on to it and get possession of it for the purpose of investing their capital, and eventually of selling the land and water in small tracts to small settlers. I would say that the object of capitalists in investing money in land in large quantities and appropriating the water in large quanties for irrigation is ultimately to sell both the land and water to small settlers at a profit.

Q. What have you to say about the water rights?—A. I have my own idea about them. The idea of Mr. Redding that the water should be owned and controlled by the State I fully concur in. I think nothing would be so desirable as to have the water rights administered and taken possession of by the State, and controlled for all future time by the State. Now, there are difficulties arising, and, as Mr. Redding suggested, it will be the source of more litigation in this State than most anything else, and it is a subject upon which the vital interests of large settlements depend, and the settlement of that question has become one of vast importance.

I would say that the constitution of this State provides for the organization under the general law of corporate companies, subjecting these companies to the control of law by a specific provision of the old constitution, which says "that any law passed under this constitution, either providing it be for or against corporations, shall be subject to amendment or repeal by the legislature." That subjects all corporations to the control of the legislature, even under the old constitution, and the new constitution is still more stringent, subjecting corporations to the control of the legislative power.

Now, in regard to the monopoly of the water by corporation companies, this difficulty exists at present. My idea would be to escape that difficulty by the plan proposed. To illustrate this proposition I might refer to the Riverside settlement, which I started myself, and therefore I am familiar with that above any other enterprise. The plan was to organize a corporation, to purchase the land and appropriate the water for the use of a colony—to supply the settlers in the colony, within certain townships, with water. The water was so appropriated; but as time went on some settlers located upon government land, and our irrigating canal had been taken across the government land, the government giving us the right of way for this irrigating canal. For five years or more settlers were supplied with water during my administration as president and as general agent of it.

To those on the government land and on the land the company sold to settlers the water was supplied at the same price, with this one condition attached to those settlers on the government land, which they acceded to the first year, that they should make their own distributing ditches. They did that at once, and then they were supplied for more than five years on the same terms as our settlers. After my health failed I was compelled to leave the enterprise, and then new capital came in and the enterprise was enlarged. Then the difficulties arose. The parties wished to sell the water, they wished to sell their lands, but they made their terms such that the settlers on the government land could not possibly accede to them.

The settlers on the government land were taxed $20 an acre to put them on a par with the settlers on the land sold by the company, thus discriminating against the government, for the government land would not have been sold without this irrigating ditch had been there.

In the discussion of this matter, when the litigation commenced, the company assumed this attitude: A few persons have come from three to four thousand miles and settled upon the lands; they have purchased from the company; the company takes the position that they are not under obligation to sell a drop of their water to settlers, even if they have purchased the land, because there was no civil contract in the purchase of the land that required them to do so, and that, therefore, they were not bound, even if the enterprise was commenced for the very purpose of supplying the land with water, and notwithstanding the laws of the State that water must be appropriated and used for useful and beneficial purposes, and that when it ceased to be so used the right to it also ceased. The company assumed that attitude.

There comes in a very important question to settlers who buy land of corporate companies. They have got their arrangements made, trees bearing, their homes built up, their improvements made, and the company says: "We are not under obligations to furnish you a drop of water, and will not unless we choose to do so." Then all those settlers who have been induced to settle in that manner on the lands sold to them by the company will be broken up. Suppose they take it in this light and claim a right to cut off any settler's water supply. This destroys his farm; and this is an instance where a man is a slave. The laws of the United States and the laws of the State ought to provide a remedy. There should be protection to the settler, and there should be nothing left to the mercy of any corporation. This matter is now being tested in the courts; it is now before the supreme court of this State, and has been pending for two years.

Q. Now, the land and water do not go together; we have a water property and we have a land property. Throughout the whole area where irrigation is necessary in the United States all agriculture is then dependent upon the water, and in all the irrigable country we have two properties independent of each other. In all of that same country, too, there is more land than there is water to serve it, and that makes the water companies independent. If you do not want it on your land they will take it somewhere else. In view of these conditions would it not be better for the water and land to go together, that title and right to the water should inhere in the land?—A. I

think it would be much better to have the land and water go together. If the land and water shall be entirely separate in years to come, my judgment is that there will be thousands of instances where very valuable fruit trees and vineyards will be left to perish for the want of water, unless there is some control by the State over that water and compel the use of it for the settler.

Mr. REDDING. If you will get some intelligent Spaniard from Southern California you will find a system which works exceedingly well.

Mr. NORTH. I think practically that water should inure in the land. In San Bernardino County the mode is this: Here are settlements along the plains on either side of the stream. From time to time as new settlers come in the distribution of the water wants to be adjusted anew. For this purpose commissioners are elected. When any question of ground arises these water commissioners meet and determine how much water is needed and give direction to the different districts, and they have water masters who control the distribution of the water to a particular neighborhood for which each is selected. A water master has charge of certain ditches under the control of the water commissioners. He has directions to apportion out to each individual the particular amount of water he is to receive, and so it is arranged from year to year. This is the general law. The only private corporation for the distribution of water is at Riverside.

Mr. REDDING. This belt of irrigable land is 500 miles by 30 miles. That would be 15,000 square miles, about 96,000,000 acres. It is not likely that any company would monopolize this amount of land.

Mr. NORTH. As a general principle the water should go with the land, if it is to be so regulated as to distribute it when needed. That could be done by water commissioners.

Q. What do you think the condition will be here in fifteen or twenty years if the present state of affairs continues?—A. I think it will produce a very general embarrassment, and in many instances ruin, and in a great many other instances anarchy and communism. There would be lots of men driven to desperation who would seek to secure by force and violence what they deemed their inherent rights. I think the national government should regulate it, so far as the government lands are concerned, hereafter. They now give the right of way for irrigating ditches; they could append certain conditions to these rights and, so far as they have any control, use it in the right direction. Most of the water would be a subject for State action. The only remedy I see would be to have all water rights in the State condemned and purchased by the State under eminent domain.

Q. What suggestion have you to make concerning the timber and pasturage land?—A. Concerning the pasturage land, I concur with Mr. Redding's statement.

Q. Where the timber lands and pasturage lands were reserved, would you reserve, in the hands of the government, the mineral rights that might attach?—A. It seems to me it would be wise to reserve the mineral rights, so that if a man should wish to have just the timber land, I don't think it should be sold for anything else. I would give a prospector an opportunity to prospect upon the land, subject, of course, to the rights of the holder of the timber upon it. Under the present law the mineral is reserved. I really think there is no system that could be adopted that would not, in many instances, in the hands of some men, work to the prejudice of the community; but in view of the enormous difficulties now existing, I cannot help thinking that there would be much less of it if the regulations by which lands could be entered permitted the title to be obtained at once by private entry. The interminable delays and long, tedious, and vexatious litigations, and, where there is no litigation, the vexatious labor of getting a claim through the departments is all very oppressing. There are thousands of men in this State to-day being crushed on account of the expense of getting titles to their land where there is hardly any contest at all, having to wait and wait from year to year, where they should get the title at once. I think the parties who have the disposition to improve the lands and make homes, if they could obtain titles at once it would be an immense advantage. The people are obstructed continually now, and if there was facility by which honest men could step forward and obtain homes rapidly, the development of the country would be fourfold to what it is to-day. That is the way it looks to me. I have lived on the frontier for twenty-five years, and during that time I have had more or less to do with obtaining titles to government land, and this is the result of my observation. There is no obstruction so great to settlement as the getting of titles. The unsettled condition of the ranch lands, under Spanish grants, is a great drawback. In my case everything had to be kept here obstructed for eight years, before I could get title to the Spanish ranch land, and there are very few of them that now have titles. There are a score of them whose cases are now hung up at Washington awaiting action; waiting on questions that any intelligent local land officer could settle in five minutes. How much longer they will have to wait I do not know.

Take a case of double entry, where two parties are found upon the same local subdivision. They must make a joint entry of it. They agree perfectly between them-

selves; there is no contest whatever. They agree exactly as to the position of each, and all that they want is to let the department give either one of them title, that they may divide it. All that has to be sent to Washington, although the local land officer could decide it in five minutes, and there it sleeps in the Land Office for years.

I do not see the propriety of sending these cases to Washington at all. They could be settled by any intelligent local officer. If there are defects in the law they should be amended. As it is now, if a man ventures anything he may lose it all by some rule of the department. After a man obtains title it should be a real, genuine title.

I have within my knowledge something of an illustration of that kind, where the unsettled condition of Spanish titles and Spanish lands will illustrate that feature of the case. There is a portion of the land on the lower bank of Santa Ana River, in San Bernardino County, where a considerable portion of government land lies between two ranches, and there has been a dispute for years about that land. It is said to have existed for more than twenty years. One of the ranch-owners claims that the line should extend to one place, and the other claimant declares it should extend to another place. The government settlers then came in and declared that neither of them were right. This has been running for more than twenty years, and the result is that a few persons have gone on there with little stock, and, feeling the uncertainty of their position, they have made no improvements amounting to anything at all. They have waited and waited, and under this system it seems there like desolation; whereas, if it had been entered by individuals, it would have been a thrifty portion of the county.

Up to this past season that line has been unsettled. It has been settled since; the surveyor-general went down there and examined it for himself. Now the settlers know where they are; some of them are on and some are off their proper places, but now they can go on and improve understandingly. That incident is one out of many. The way it affects the other government lands is this: Until the lines of the ranches are settled the government lands cannot be surveyed officially, and therefore no homestead claims can be filed and no farms can be made available; no titles can be obtained from the government, and everything has to wait and wait. The pre-emption claims cannot be transferred, and therefore a claimant must hold on.

Under the decision of the Supreme Court of the United States, where the lines of the Spanish grant are undefined—for instance, where a man had originally eleven leagues and the description indicates fifteen leagues—he has the right of ejectment all over the fifteen leagues until it is determined where the eleven leagues are. Therefore his object is to defeat the survey and keep off settlement. The courts have decided that they cannot settle on that land until his eleven leagues have been determined upon; and thus he holds the fifteen leagues and fights off surveys in order that he may hold the whole land. This Commission cannot do any wiser thing than to recommend a speedy mode by which the Spanish grants in Arizona and New Mexico can be settled at least before men now born die.

To illustrate the difficulties that spring up now under these delays: Take that Harupa case. It was hanging more than twenty years. The grantee was not satisfied with the west line of the ranch as it was surveyed by the surveyor; he applies for a re-examination of that line, and the surveyor-general sends down an expert from his office to run it; he goes down there and reports in regard to it and in regard to the initial point of Pechapa. This was the initial point of the survey of that range. The expert reported that there was no doubt about that point; he goes back, and then the thing hangs for more than two or three years, when another application is made for an examination of the line, the railroad company having objected to the confirmation of the survey because there are bends where there should be straight lines. If these lines were straightened it would throw out some lands that the railroad company would be benefited by.

In the mean time the expert is sent down again to examine it, and he reports in favor of straightening the line, but the decision of the Supreme Court prevents the railroad company from getting any of it, so that their interest in it was lost when a new interest springs up.

Following this second examination of the land by the expert, the owners of the ranch claim that they were injured by straightening the lines, and call for a re-examination. Then the same expert is sent down, and reports as to the east line that it should not have been straightened, and reverses the previous recommendation. Subsequently to that another application is made to remove the pachepa, the applicant stating that it is not on Pachepa Hill, but that the real point was two miles east of that. The same expert is sent down again and reports that the eastern point was the one. Then settlers make a sharp conflict to prevent the removal of that pachepa, that had been settled there after twenty years, and this expert told me himself that he had been sent down four times to report upon the lines of that one ranch, and I believe he made a different report every time.

That illustrates how new difficulties spring up by these delays, difficulties that were not dreamed of in the start.

The settlers are kept constantly in trouble by these delays. It seems to me that in-

asmuch as these difficulties must be very crippling the sooner and quicker they are settled the less difficulty they will have in the future.

Mr. REDDING. A law should be passed that the claimants of Spanish and Mexican claims in Arizona and New Mexico should, within one or two years, file a plat of survey making those claims by definite and natural bounds, and those boundaries should be those within which the claims should eventually be fully satisfied. These persons can settle outside of these boundaries with safety. I would make a failure to comply with the law a forfeiture of the grant. There should be a limit of time within which persons having claims living in New Mexico or anywhere else should be compelled to file a plat of their claim. If a man has 11 leagues and wants 15, the 11 leagues should be found somewhere within the 15 leagues. Then there should be a statute of limitation as to time within which he should be compelled to find the 11 leagues.

Mr. NORTH. The department, as I understand, has to pass upon all these questions. It seems to me the sooner they can take some steps about it the better it will be for all hands.

Mr. REDDING. This question cannot be settled in the courts, because the court has no knowledge of the locality. Some cases that went into the courts nineteen years ago are still there.

Testimony of W. H. Norway, deputy surveyor, Los Angeles, Cal., relative to Atlantic and Pacific Railroad land grants and pastoral lands.

W. H. NORWAY, deputy surveyor, examined.

I have been deputy surveyor since 1864, some fourteen or fifteen years. I am familiar with the country covered by the forfeited grants to the Atlantic and Pacific Railroad Company perfectly, and the grants to the Southern Pacific Railroad also.

The terms of the Atlantic and Pacific charter are to tide-water, that is to the Pacific Ocean. They surveyed also a line by Joledad Pass, and it strikes tide-water at Santa Buenaventura. They have not run to San Francisco, but the land is suspended even after striking tide-water. We have always contended that they had no right above San Buenaventura. There are a good many fractional townships that have been surveyed that have been suspended and none of the odd sections can be entered and the even-numbered sections are held at $2.50 an acre.

This thing is working very badly with us. I have understood that the agents and attorneys of the Atlantic and Pacific Railroad have offered to take the sum of $40 for their right to any 160 acres in their grant. I know some land to which they did waive their right, that of Newbold. I have been told that one Luce, of Washington, is the attorney, who is authorized to perfect claims at $40 for every 160 acres on behalf of the railroad grant—for that sum to get a release from the road.

I corresponded with Coffin, the land agent at Saint Louis of the Atlantic and Pacific Railroad. I asked him if he could waive the company's right to certain townships, they being fractional and small portions having agricultural land and a few settlers wishing to procure titles. He answered me that he was not authorized to waive any right, yet in all probability the settlers would never be disturbed in their occupation of the land; that the road was in the dim, distant future, even if it had a future. I saw some of the letters from this Luce firm in Washington to Mr. Cooper, but did not take such particular notice of them as to state their contents now. I cannot state the language of the letters now, but either the letters or Mr. Cooper informed me that he was prepared, through parties in Washington, to make a release upon these terms of the Atlantic and Pacific Railroad interest. He asked me if I wanted to engage in the business, and I told him I did not wish to engage in the business, for I thought it was a system of blackmailing. I sent a copy of this letter to Coffin, and to Booth at Washington. He introduced a sort of general bill, and not a special bill as I had wanted. He also referred the letter to the Commissioner, who stated that he had no authority to restore the land without legislative or judicial action. Luce wrote Cooper that the Atlantic and Pacific Company intended to avoid the forfeiture of their grant on the ground that the government had failed in its obligation to extinguish the Indian title through the Indian Territory, and consequently they had the right to not build the road; that they had not wrought the forfeiture.

There is not a foot of land in Santa Barbara or in Ventura County but what is included in this withdrawal of the Atlantic and Pacific Railroad, and yet these lands are rapidly filling up with settlers.

Whenever there is made the survey of a township, and the same is returned approved, there ought to be some way by which parties will be advised that the map is on file. For my own part, I have been advised through the courtesy of this office; but there ought to be some authority of law for it. There should be some provision

by which the filing of plats should be published in a paper near the claim, and the time should begin to run from the expiration of this notice. It might be well to publish such notice a month in some weekly newspaper. In point was the case of a man who told me yesterday that for want of such notice he failed to file, and the Southern Pacific Railroad Company got his land.

In this district the local officers notify us and we give notice to the settlers, but all this is a mere matter of accommodation. There may be many settlers that I cannot reach. And then, if a settler sees a notice of filing in a paper, he will pay more attention than if told by an individual.

The last maps I sent in I got my draught three weeks before the map reached this office.

And now, to go into the matter of the segregation of the petroleum land from the agricultural land, it is very difficult to make this segregation. I know of some parties who are holding 160 acres as agricultural also filed a mining claim upon it, and also took up adjoining claims as miners; and then these hold 160 acres as pre-emptions. Those remove on the petroleum lands, the department having ruled that petroleum is a mineral. They renew their notices year after year under their local mining laws. They got me to go out and show them the lands.

My policy would be to dispose of the public land as fast as possible, and there should be some law by which parties should take up more than 160 acres of grazing land. Now, along the rivers they can get water, but the balance is good grazing lands; and I know of parties who would purchase the whole township, 3 north 21 west, if it could be had for grazing lands. But there is no water upon it, for they have sunk 100 feet and failed to get water. I know of one party who wanted to take up 160 acres on the run, and said he would be willing to take a portion back of the ranch here at $1.25 an acre.

There is scarcely any land in Santa Barbara or Ventura County that is fit for agriculture that has not a settler upon it, but no means exist for acquiring title. But other lands remain unsold; while, if they could be sold at $1.25 per acre, many persons would take up those lands for stock purposes, and then the government would get a good price and the State would get her taxes.

I believe in selling the government land, and if there are settlers, giving them the preference. Beyond this I should recommend the graduation law to dispose of the public lands, and I could not suggest any other system that would be so well adapted to the case.

Testimony of George A. Nourse, at San Francisco, Cal.

GEORGE A. NOURSE, attorney at San Francisco, Cal., testified October 8, 1879:

Question. By what method of administration system can the timber lands be best utilized, as that the timber necessary for the industry of the country can be used and at the same time the greatest amount of timber be preserved from destruction and waste?—Answer. My impression is that the sale of the timber lands will be decidedly the best instrument to prevent the waste. I think when men can own the land they will take a great deal better care of the timber than they will of the government timber; and the sooner the government can get the timber lands out of its hands and into the hands of persons who will manufacture it, the better it will be all round. As long as it is in the hand of the government, it will be stolen. I have had something to do with lands all the way from Minnesota to California, and in every State I have known the universal experience is that government lands are considered fair booty. My idea is that while the people on the timbered lands are cutting and slashing upon government timber they feel that they are liable to be stopped every moment, and hence they have no interest except what they can take, and they strive to get all they can; and they take only the best trees and only the best portions of the trees. They will waste a great deal of the top and of the butt, and the tops being left on the ground there is much more liability to fire, and so in every way the timber is wasted and is used wastefully without any economy, as would not be the case if it had passed into private ownership. Probably if the timber was properly protected it would furnish several times as much lumber for the convenience or necessities of a community as it will under the present system. If it was owned by individuals who themselves had an interest in economizing for manufacturing uses, there would then be no stripping from the government lands. It must be remembered that the authorities at Washington have done very much to bring about this state of affairs. I attempted to check depredations when I was attorney-general in Minnesota, to that extent that I sent a man up to the woods—measured every stump, so that we had accumulated by the spring data of the amount cut by each lumbering party. The next thing we knew, the depredators had taken the alarm, and after trying in vain to stop the proceedings

in the State, they started on to Washington, and on *ex-parte* evidence, without even the courtesy of a notice from the Interior Department to us, they were allowed to compromise by paying a ludicrously small amount. We found it utterly useless to prevent these depredations. I mention this to show that the government is responsible for the idea that has grown up that it is the right of individuals to take timber. The thing that perplexes me most is how to manage the sale of timber land so that it shall not pass into the hands of monopolies. Almost all previous laws intended to prevent that have proved to be a dead letter. I am not prepared to say how that can be prevented.

Q. Could this timber be profitably and individually owned by farmers who live in irrigable districts?—A. Very seldom. I do not see what they would do with it. Their lands are a long way from the timber, and to manufacture lumber in this State—to get the timber and manufacture it—requires a larger expenditure than any place I ever saw. It costs too much to build mills away up on the mountains and in the construction of roads, &c. They bring logs here a long distance, and they have flumes as well, which are very expensive. This fluming the lumber is very expensive. The timber that grows on the mountains has to be brought down. On the coast, among the redwoods, which is not on very high land, they have to lay down railroad tracks; they have to do it in the summer-time on the dry ground, and haul the logs on the tracks a long distance. Sometimes they put up the mills and then build railroads to bring the lumber out, and in this way a large investment has to be made. No man can be in a profitable business in lumbering here without a very large investment, running up into the thousands and tens and sometimes hundreds of thousands of dollars. There is on the coast an additional outlay in the building of chutes, &c., for loading. Then they have to have mooring grounds for their vessels; so that it is a tremendous operation to get ready for successful lumbering on the coast. There are companies that have hundreds of thousands of dollars invested in materials and the appurtenances for lumbering.

The lands should go into the hands of persons who are engaged in timber enterprises. It is not worth while to go into milling operations unless the owner can have timber enough to supply him a great length of time. It would be foolish to go into these large investments for a small amount of timber. Practically, the mills on the coast have got control of the valuable timber, which naturally goes each to its own mill.

Q. Is the land, as land, of any value?—A. There is much more land in this State that is capable of irrigation. If you cut off the timber the land is left in large tracts, and for the present nobody would go to cultivating timber lands after the timber has been cut off. Persons sometimes now go in and say that the land is agricultural land; that they are cutting the timber off in order to cultivate it. But I do not think that timber land is good for agricultural purposes as a general thing.

Q. What interest would a man have in keeping the timber on it—why would he not sweep all the timber off?—A. Because he wants to leave a good growth to grow up and keep up the supply of timber; he wants to use it as economically as possible. In seeking to protect his timber that is now valuable he must necessarily protect the whole ground. He cannot protect only a few trees and let all the rest around him burn up; and in so doing he protects the entire growth for the sake of the young growth, which will finally be worth something to his children. I do not know whether there is any young growth here that will in a generation be of any value; but it has proved so in Maine, and it may be so here. I would say, in regard to the small owners of land, that there is a class of men that have done something with lumber. There is a class that you might call permanent settlers, and not a class that add very much to the wealth of the State. They go on to a piece of land, claim to be pre-emptors, fell the trees, make railroad-ties, shingles, spokes, &c., and so on every quarter section they get work to do, and turn their work into money for a number of years. I doubt whether such a population, whose residence is so temporary, is especially desirable. They are certainly not so desirable a population as those who cultivate the land.

Q. What is your opinion of the irrigable lands? By what system can they be disposed of?—A. I find it very hard to make up my mind. I will say this: that the popular cry and prejudice against those who purchase large bodies of land with the intention of constructing irrigating canals and ditches, and who have spent large sums of money in that way, is unfounded. I think those men are doing the best work in the State. I think that at present it would be very nearly impossible to get irrigation works, to any considerable extent, by the action of small owners. My experience with the farming population has been always that it is very difficult to get them to work together; their solitary lives make it very much more difficult for them to work together than for people in the States, who are in the habit of co-operation. I know of the irrigation works of Messrs. Haggin & Carr, and Livermore. They have very extensive canals for irrigation in Kern County. It is my impression that they will be the men who will make the least out of the improvements they are making. The expenditure is very large and the return is remarkably small. All these irrigation works are being done at the expense of wealthy men, and they are going to result in the benefit of the future owners of the land.

Q. What are the difficulties in the way of settling and utilizing the pastoral lands by actual settlers?—A. The trouble is, that under the present laws no man can get more than 160 acres by a homestead or pre-emption, and this is a ridiculously small territory to give a man to live on, merely for grazing cattle. The pastoral land here is not like the pastoral land in the Eastern States, that grows white clover. It takes acres and acres to support one animal, and especially when it gets toward fall. To have enough stock to support a family you must have much more than 160 acres, taking the average hill pasturage lands. A man cannot do anything with less than several sections. I should think that four sections would be none too much. Of the pasturage lands now owned by the United States, four sections would be as little as any man could support a family on. Four sections would be sufficient in most places in Nevada, with such little cultivation as they could get, where they live very roughly and away from civilization.

Q. Would it be well to reserve the subterranean rights until the lands are taken up?—A. I do not think that if we should sell the timber and pasturage lands in large areas that would include the minerals. My idea is this, as I have stated, that the sale of the pasturage lands should not prevent other persons from prospecting for mining or taking up mines under proper restrictions, so as to indemnify the owner for damage done, and they should not be excluded from the privilege of locating mineral there if they do it in the ordinary way. The parties taking up the land for pasturage or agricultural purposes should be put on the same basis as the prospectors. In the matter of irrigable lands in the foot-hills, I do not think the question of mineral ought to be opened after the patent issues.

As Mr. Redding has told you, Commissioner Drummond declared 200,000 acres of land mineral, and thus compelled men who wanted to locate upon it to prove it non-mineral. The pre-emption law simply excludes from its operation, so far as mineral is concerned, lands upon which there are any known salines or minerals, clearly leaving open to pre-emptors lands upon which there may be salines or mines at present unknown; and when a Commissioner or any executive officer interpolates in any patent such exemption, if there is no other authority of law for it, it seems to me that he attempts officious legislation, and it seems to me, too, that the law as I understand it is right in that respect, and when a man has his pre-emption patent that he should own his land. If there is any mineral found upon it afterwards, that unless the patent is set aside by due course of law for the reason that the pre-emptor knew at the time of making his entry that there were salines or mines concealed on it to his knowledge, except in such a case the pre-emptor should receive a title to all there is upon it.

I wish to say a word about another matter. I noticed that your printed questions refer to obtaining title. I think that one great difficulty is that there is no compulsory process for the attendance of witnesses. I think it is very necessary to the ends of justice that in contested cases before the Land Office the land officers should have that power. For instance, there may be a person who knows all the facts that are necessary to give one claimant his case, but he is a friend of the other claimant and the first one can't compel him to testify. Then I think it is very necessary that better pay be given the clerks in the Commissioner's office, who have to pass upon the questions involved in these contests. Frequently it is a contest over homestead or pre-emption entries or State locations, &c., and I think the pay should be such as would secure the services of more competent men than you are likely to get for $1,800, because some of the most involved questions of law come up in those cases and their determination requires men of real judicial ability. I do not suppose you can expect to get that ability unless you give them better pay. However efficient and competent a man may be as a man, no clerk who is there now, if he is ignorant of the law, is competent to pass upon these disputed questions. The Commissioner can't, of course, be expected to examine these cases. The duties of his office in regard to the mere matter of interviews are so onerous as to take up most all of his time, and he has to depend upon his clerks.

There is another matter. Our surveys are miserably executed and unreliable. My own impression is that they are likely to remain so until the surveyors shall be paid a price that will enable them to make you a reliable and accurate survey without loss to themselves. I do not think the mere paying of a higher price will insure an accurate survey, but it will make it possible. As I understand the case now it is hardly so. I have had occasion, by a case in court recently, where it was necessary to find the corner of a township (I think it is the corner of townships 15 and 16 north, in ranges 16 and 17 west, on the Mount Diablo meridian), to examine this question of surveys. In the case I cite, where the lines came together, it is impossible to locate the corner of the townships with any degree of certainty. I have come to the conclusion that no stake was ever set there. The work was done long before the present surveyor-general was in his office. The survey was made by private individuals and paid for at the time by one McLeod, on the fortieth standard parallel, and the measurements that have been made since show it to overrun enormously. Some years after that a contract was let to this same man to run that line officially, and he never made

any other survey, but, as will appear by the files of the office, he filed the field-notes of the survey made some years before the contract was made. He took these field-notes and used them as the field-notes of the survey under the contract, no trouble being taken to alter the dates or anything, so that upon its face it presents the absurdity of a survey having been made before the contract for it was let; and those corners have never been found by anybody that I can learn of, and the location, as fixed by the field-notes and as fixed by the field-notes of the subsequent survey that was run north and south between these two townships, will vary in some cases 30 or 40 rods. If it is located as the field-notes would seem to say, then section 36, in the southeast corner of township 16 north and 17 west, will have straight lines nearly at right angles to each other for the north and west lines, while its east line will shoot off in nearly a southeast direction, and the south line in a direction considerably south of east, and it will come together at an acute angle a long way from where the real corner would be if the section was made square. Now it certainly seems to me that before it had been admitted to proof at all it should have been examined in the field by some person other than the surveyor.

Q. You have been engaged in the practice of law and probably know the forms of procedure in obtaining titles to land from the government under the homestead and pre-emption law. Won't you tell us what you think the difficulties are in obtaining titles?—A. I had not thought much of that, but I will say this: That which is said by those endeavoring to obtain title under the pre-emption and homestead laws must be taken with some grains of allowance. There are a vast number of persons who will endeavor to get title that way who are not *bona-fide* settlers; and many of those difficulties in the law, especially those which require settlers in acquiring homestead land to stay on the land, are necessary for the reason that without these requirements they would make it a mere matter of speculation; and if the theory of selling the land off at low prices or even giving it to actual settlers is at all correct, I do not see very well how that result can be obtained without these precautions and without these requirements that are considered so onerous. There are general laws which are adapted and tend to secure good faith, and the rules have to be pretty strict. I will say this, that I have seen and heard more hard swearing in pre-emption cases and more fraud on the part of the United States pre-emption settlers than I have in any other class of people I know of. It is due to the fact that so many dummy cases are made; it is not done by actual settlers, but by persons who are making fraudulent entries. There are a great many of these people.

Q. Do you think there is any man living who can take the pre-emption act oath of 1841 and the proof that is ordered in that act, and do it without committing perjury?—A. I don't see the difficulty. If the government chooses to make a conditional sale and you choose to purchase upon those conditions, I do not see why a person need take it. The government has the right to sell it subject to those conditions; the requirements of the law only relate to the intentions of the person at the time of entry. I do not know of any condition after the entry is made; there is no subsequent condition that I know of. I have never so interpreted it, and I do not know of any requirements that will prevent a man from selling the land afterward if he wanted to. A man can sell upon the duplicate receipt of the receiver, and it is only objectionable when the attempted sale is made so speedily after the entry as with other facts to show that the pre-emptor's intention was really, notwithstanding his oath, to sell it. If he really did buy it on speculation and if he really had made a bargain before owning the land to sell it, then, of course, he would be perjuring himself.

The Supreme Court has decided that they can sell the land on the duplicate receipt of the receiver. The only times the department has set aside an entry for that reason has been when, taken with other circumstances, it shows that the entry was a fraudulent one; not because of the entry alone, but because of the proof of fraud of which that entry constitutes a portion.

I think there ought to be a law that the register's certificate shall hold good. I do not know any policy that would be subserved by preventing the miner from selling his lands; I do not know any practical result that would be subserved by preventing it; and yet there is another matter in relation to that, which is that is it desirable to furnish facilities for taking up mines. They hold them and let them lie without doing anything upon them. The requirement that keeps men at work upon these mines until they are patented has a tendency to promote development. The government virtually parts with title when they get the register's certificates.

Q. Cannot all the forms of the Land Office be simplified?—A. I am not prepared to say that all the forms could be simplified; I find that certain things have to be done before a certain end is brought about. There has got to be a tribunal to decide when these acts are done, and you must decide that on testimony, and when you come to take the testimony, then the flood-gates are opened and there is no limit to the amount that may be recorded or taken. I do not see that, so far as the method of taking testimony is concerned, how it can be simplified; but it never seemed to me that there was a great deal of red tape about the paper form. This blank form for taking the

testimony, instead of being an onerous requirement, is simply a reduction to a system of the requirements and a great relief to the one who is taking the testimony.

Take pre-emption and homestead cases. The settler files his affidavit, and thereupon the register's certificate issues. Then comes the making of proof; then non-mineral affidavit; then, again, comes his two witnesses and his own application to pay for the register's certificate and the receiver's receipt, and all these things are necessary to keep a record of what is done.

Q. Would it not be well to put it all on one sheet of paper?—A. The only thing about that would be perhaps some would go to one place and some to another place; possibly, though, they might all be put upon one piece of paper. I do not think the charges are particularly onerous upon settlers; I think the most onerous part is the distance they have to go to have their witnesses examined. If there were no tricksters to take dishonest advantage, I should say let them all go before a notary public or clerk of a court and make their affidavits and send them; but I am a little afraid that there would result a very loose system of doing things.

In land cases I do not see why you should not allow an attorney in fact to attend to all the business. Except where affidavits are required, which can only be properly made by the applicant himself, I do not see any advantage of personal signature.

Q. What do you think of taking the testimony before county judges and outside officers?—A. I have rather an objection, owing to my early political training, to the use of State judicial officers by the United States. I would prefer that they should be government judicial officers before whom the testimony should be taken. I have never looked with any favor upon a State judicial officer having any connection with United States proceedings. It seems to me it is a little degradation to the State judiciary.

Q. What is the effect upon the character of evidence? Does it improve or injure the character of the evidence, both as to form and credibility?—A. I should not be able to say. There does not occur to me any reason why there should be any change in the matter.

Q. Have you had any occasion to examine the testimony taken before these outside officers?—A. I have not had any experience.

Q. What, in your judgment, is the advantage of continuing the present system of mining laws, customs, and regulations?—A. I do not see any advantage at all. It should be purely a matter of United States law.

Q. State the disadvantage of the present system and the system you would suggest as a substitute for it.—A. In the first place, there is always great difficulty about the local laws as to what they are. It seems to me that the United States ought to have a system of its own. I think this idea of local laws is a mere continuance of institutions that sprang up from necessity. When miners settled upon the land for the purpose of extracting the mineral from it, and the United States did not offer any protection for the rights acquired by those miners, it was found that it would not do for every man to be a law unto himself. The State had no authority to make laws about United States lands in possession, &c., and so these laws grew up simply as a crystallization of the customs and public sentiment of the people in each locality. That was all there was of it. Each land district made a sort of mutual-defense club. The people in that district said, "We will stand by each other;" but if there were not some rules to go by there would be nothing but murder, and the taking and defending of these mineral claims would be a matter of brute force; and so each little community agreed to stand by its members. They said, "We will have these rules and defend each other under them. We will give each man a right to locate so and so, and so long as he does that we will uphold him. The State is powerless and the United States does not regulate it, and we will regulate it ourselves." Now that necessity no longer exists, and it ought to be discontinued.

Q. How many parties does it take to organize a mineral district?—A. I do not know that there is any rule about that; some are ridiculously small. I do not happen to think of anything that would prevent two men from coming together and organizing a district and fixing the boundaries. They need not be miners, if they only profess to be. There is nothing to show that they are citizens of the United States or miners. I do not know what the size of mining districts are; I am not familiar enough with the subject to say. There must be no limit to the size, for a dozen men frequently get together and take in a region, sometimes twenty miles by ten. There is nothing to prevent the districts from overlapping; in such cases it would be held that the laws within the limits of the first district would take precedence. There is no authority to prevent others from making a mineral district within an old district. In such a case different regulations may prevail in the same district. There might be two organizations making on the same day districts that overlap each other; and you cannot say by any rule which should take precedence.

The usual method adopted by a miner is to stick up a notice on the claim and then record it, in the form prescribed by the local mining law. They never have required the

same strictness that the United States laws do in establishing the boundaries, and the result is that miners do not give the information as required by the Land Office, and there is not one location out of ten that is made in accordance with the United States law.

There are several decisions made by the Supreme Court where both locations were made in accordance with the mining law and pronounced by the court good for nothing, because they did not establish their boundaries properly. These notices are written either by miners themselves or by some briefless lawyer, in their own forms of description just as they themselves fancy. You will find many of these claims recorded where they say "I have located this day fifteen hundred feet of this ledge running one hundred and fifty feet each way, north and south from this stake;" and there is nothing to show where that stake is. A large proportion of the locations made up to this time are made in that miserable inefficient way, breeding litigation and failing to carry out the object for which they were intended. The location notice is recorded with the district recorder. There is no security for the preservation of the records and they are very frequently destroyed, and generally are very difficult to get at. There is no other security than the individual honesty of the recorder, and the whole system works opprobriously. It was the first attempt to bring order out of chaos. If the records are changed there is no means of remedying or correcting it. They might be proved by parol evidence, but that opens the doors to all sorts of perjury. They have always allowed in any county of the State where the records were destroyed by fire parol evidence. If the records are carried off, I suppose the same rule would apply.

Q. Is not the certified copy of the record made sole evidence of mineral patent under the United States law?—A. It is; the government has no other method of proving that certificate except the existence of the records. I would abolish that system entirely, and have the location recorded as is now required. I think it is an excellent provision that the boundaries should be fixed and permanent monuments established, so that the boundaries could be easily traced. I would provide for some record of location, within reasonable time, to be fixed by law, and in some permanent office, whether the recorder's of the county or the land office I am not prepared to say; my impression is, in the office of the recorder of the State. If a fraudulent copy is presented to the United States land office, the land office is obliged to accept it, unless they know of the fraud. They have no means, nor can they have any means, to prove it a fraud. In *ex-parte* cases there is no check. It would be well to require that the notice of location should be filed with the United States land office. It at first occurred to me that that might be onerous, on account of the distance, but it can be sent by mail. I think that would be the best way. I think the United States should keep it in charge of its own officers. There should be a limit in the land office primarily. Within three months of the location I would require duplicates to be sent to the General Land Office. There would then be a check in the General Land Office.

Q. Would it not be well to require that locations should commence with an official survey?—A. Well, there is frequently a good deal of excitement in the locality where locations are made and men are rushing to get the first locations. I don't think it would be well to require that just at the commencement; but it would be a good requirement that it should be done within sixty or ninety days after the location; but a man cannot get a survey made that way in the first rush. It would be important, but it is a work of time to get a survey of a district, and a man might not be able to get his survey. It would cost more to make an application for a survey than it would for the filing of the notice.

Q. Would not your objection be met by having the survey, when it was made, date back to the date of application?—A. Well, that is my idea exactly. The only objection would be as to the necessary time for making the survey. A man must be enabled to obey the law, to initiate his claim, by one single act of locating the post and the notice. He must be able to do, promptly, what is necessary to initiate his claim. Then there should be an application for the survey, and the survey should be made as speedily as possible after that, in order to get certain possession of the claim.

Q. The whole thing will be regulated by causing him to mark the boundaries of the land, post his notice in a conspicuous place upon the claim, file his notice, and make application for survey. Then, when the survey is made, have it date back to the date of application?—A. I think his merely posting the claim should enable him to date back to the act. Then he might follow that up with the marking of his boundaries.

Q. Should not the surveyor-general be prohibited from making any survey upon any claim that has already been surveyed?—A. I think that he should not be allowed to make any survey of so much of a claim as had been previously reported on in a prior valid location; but I think he should be allowed to make a survey of the balance of the claim, provided the applicant preferred that. He should not be allowed to make a survey of the overlapping part. If any valid controversy existed, that controversy should be adjusted before the recording of the claim should be allowed. It seems to me that the rule should be, that no claim should be surveyed that overlaps any valid application which, in its initiation, antedates the application for the survey sought.

Q. Having initiated a claim in this form, would you allow it to rest upon a possessory title, or would you make him prove up on his claim?—A. They should be required, within a certain time, to make their proof and pay up. I do not see any benefit to be derived from delay. The purchase money of a mineral claim is a mere bagatelle. It is allowing a possessory claim when there is no necessity for it; the government should require payment for its land. A very large proportion of the litigation of the present day is caused by parties not proving up on their claims. For instance, there has been a second location on a mine, which is found to be valuable; then a claim of three, four, or five years' standing will be revived, and it will be astonishing with what facility they can prove that work has been done upon that old claim. The testimony will be parole. This possessory title seems to operate as a medium for fighting. I would say that one year would be ample time within which a man should prove his title. By that time he should know whether a claim is worth patenting or not. I would require a proof of the discovery of mineral before issuing a patent, and would not allow them to locate land upon which there is no known ledge. I think there should be reason to believe that there is mineral in the land before they are allowed to take out a patent for it. Under the present law a mere affirmation under oath of the applicant that there is mineral affords him an opportunity to obtain title in an uncontested case.

Q. Can you suggest any better form of proof as to the fact of discovery?—A. I have no suggestion to make in that respect. The officers cannot go to examine these things; all have to be proven by evidence, and when you require the sworn evidence of two witnesses it seems to me you have done all you can. I do not think of any better way now. In any proceeding in court, where a fact is to be established by the sworn evidence of the testimony of two witnesses, that would be deemed abundant to establish it, and I do not see why we should not deem that amount of testimony good in mineral cases. Of course there is liability to perjury, but I do not see why there is much liability to perjury on that score for this reason, that until there is valuable mineral known to be on that land there is no apparent good object in committing perjury. A man will not be likely to commit perjury without some motive for it.

Q. In the case of the passage of such a law would it not be well to provide some statute of limitation as to possessory claims, in possession as such?—A. I think they should be entered within a certain time. That is generally the practice in statutory limitation, and I do not see why the same rule should not apply here.

Q. After application, notice, and survey, would you require any proof of development and cause expenditures to be made? If so, to what extent?—A. As I understand it, the object of the mineral law is to put the mineral lands into the hands of parties who will develop and work the mines—not to sell the lands, for the parties may hold them for twenty years—and I think there should be, before entry, a fair showing. That can only be done by development to a certain extent of the ledge or lode. I do not think it is any object for the government to sell its mineral lands except upon the presumption that they will be worked, and there should be a fair presumption that they are worth the working before patent issues.

Q. At the expiration of the time for making proof and payment, should not there be a cancellation of the claim of any party or parties failing to prove up and pay?—A. I think it should become void and canceled from the fact that proof has not been made. I should not wait until another party makes application for the mine. I do not see any reason why there should be any delay in the matter.

Q. Are you familiar with the lines of litigation in the courts?—A. I have never had much practice in that respect.

Q. Does not that litigation come from parties on barren ground trying to strike the ledge of other parties?—A. I think that is very frequently the case; the great cause of litigation is the method of their locations. Parallel to the locator, who is following along the dips, spurs, and angles of his claim, there will be another claimant, who is supposed to be on a separate ledge; but ultimately they find they are on the same ledge, which has two croppings, which fact could not be established until a great deal of development has taken place. And this danger would be very much lessened, if not entirely obviated, by the square location. I would confine these locations to their own side lines under the ordinary common-law rule. I have not had much discussion of the matter, and have no reason to offer, but so far as I have thought over it myself it seems to me that that is a proper method of location. I think it is a very great object where a man has made a location of the same extent laterally to another claim, having every reason to believe it is a separate ledge and the other believing his ledge to be separate, and this not being the case but the two coming together. As it is now one takes the whole location away from the other.

Q. To what extent would you cripple deep mining by establishing a square location?—A. Well, it is pretty evident by such a system that the development of the first locator, who found his ledge run off under his neighbor's land, will insure a good deal of benefit to that neighbor.

Q. Would people invest large sums of money in deep mining if there was a limit to these developments fixed by law?—A. They certainly would not invest largely to fol-

low a ledge which they found rapidly getting into another man's ground, unless they could buy it.

Q. Would they arrange to sink a shaft four or six thousand feet deep?—A. They would not without buying beforehand all the land into which they deemed it possible the ledge might run. On the Comstock they seem to be following the ledge without any great agreement of opinion whether it is one ledge they are following or not.

Q. Would it not be possible for the next man to claim the next piece of ground, thus cutting off deep mining?—A. A makes a location. He follows the ledge down; it has a dip, perhaps, of forty-five degrees. If he has a claim of 300 feet in width on each side of his ledge, he will run out of his ground at 300 feet below the surface. The ground that it runs under cannot very well have been located by another upon that ledge; if there was no ledge cropping and no cropping of that ledge upon the adjacent land that would enable some other party, perhaps, to locate that land it would not be likely that another party would have possession of the land on which his ledge would run.

Q. Could not that objection be covered by increasing the size of the claim?—A. You might have so enormous a ledge in width—for instance the Comstock—that it would seem, perhaps, not a good policy to allow so very large a location. I have never thought of the distance, but they must be, on the Comstock lode, without running off, a very long way to the east. Their shafts are all sunk away down the hill. The area, too, allowed under the present law is 300 feet on either side and 1,500 feet in length, which is 20.66 acres. If you allowed 40 acres to one man it would cover the case. If you take a square location of 40 acres I do not think it would be too much. A man could then sink nearly 2,000 feet before going out of his claim, and the next man would have to sink 2,000 feet before getting on the ledge, and that would debar him from sinking on the next claim. Unless there is a cropping, the man who first works the mine would have the advantage, because he discovers the mine on the next claim when he strikes the true edge of his claim 2,000 feet below the surface. The question of priority would be with the man who should discover the mine 2,000 feet below, and he would go and locate it. It is my impression that the square location is the best thing; on thinking it over I am not so sure as I was at first, but it still seems to me that, all things considered, it is the best thing. If you allow a man's foot wall to be the initial point, that will be a good thing.

Q. If the square system of location is introduced, should not a man be permitted to make his discovery shaft at any point within the claim?—A. I do not see why not.

Q. In the event of the square location being adopted, do you see any necessity for continuing the tunnel claims?—A. I do not see any reason for discontinuing them. If a man has a reason to believe that there is mineral in the place, I think he should have the right to it in any way he pleases. In tunnel location a man has the right to everything he discovers on the line of the tunnel, providing the body of mineral is not larger than his tunnel.

Q. Would it not conflict with a square location?—A. No; he would simply have a right, when he struck mineral, to locate the claim where he discovered the ledge. He could not take the claim if it had been previously discovered.

Q. Would not the rule which allows a man making a tunnel location the right to anything below the surface of a claim located by another party destroy the square location?—A. No; I think not, because if a square location is made, then the locator takes all there is there and the tunnel man gets nothing, the land being located.

Q. Before his tunnel reaches the vein there would be two men on the same ground?—A. If the first man takes all of it, there is no harm in the second one being there.

Q. Is there any necessity for continuing the law?—A. Yes; the tunnel is a form of discovery. There is no other necessity in the law, except that it applies to one form of discovery.

Q. Is there any necessity for considering the mill-site privilege?—A. I have not thought of that, but it seems to be a convenience and a very necessary thing to be able to take up a mill-site in regions of this kind that have not been generally surveyed and subdivided. In the event of the establishment of a square-location system they would have sufficient area, but then it does not follow that it would be a good mill-site. They have to have water and timber, which is not always to be found upon the mining location.

Q. Do you understand that under the present law the mill-sites are restricted to non-mineral ground?—A. Yes; and I can say that it would be very awkward. Mining locations are mostly in a region where there is more or less mineral, and to obtain mill-sites the miners have really to commit perjury in many instances. There could be no harm done by allowing a mere location of a mill-site. I have thought whether there should not be a requirement as to mill-sites that work should be done before title to the site is parted with. I think that it would be a wise provision to compel a party to show that the mill has been erected before they got title to that land.

Q. Is there any provision regulating the distance a mill shall be from the mine?—A. My recollection is that there is not, and I think it would be pretty difficult to regulate

the position of mills. The circumstances under which they are located vary widely You have to go sometimes very far to get water, and in other cases you can get water close by. The circumstances are so various that I do not think it would answer at all to regulate the distance at which a mill shall be located from the mine.

Q. Are not mill-sites taken up simply to hold the timber land and obtain possession of the mining land?—A. I have known cases where the mill-sites have been taken up and no mills erected. Of all the mills I have known I can't say how many have been taken up as mill-sites; but—to carry out my explanation—the Ophir mill was located originally some sixteen miles from the mine. It seemed a sensible location then. They could get water there and had grazing land for their stock. There was no good location any nearer, but as they began to develop the mines there they struck water and soon began to have enough of it to run a mill. Then, as soon as ever they got waterworks it became a good place for mills. At the time their mill was first erected it was considered to have been erected in the most desirable location attainable.

Testimony of James O'Brien, San Joaquin, Cal., relative to timber lands, mining débris, land damaged, mineral land, quartz mines.

JAMES O'BRIEN, of San Joaquin, October 24, Marysville, Cal., made the following statement:

I have lived here since 1853.

Question. Are you familiar with the timber land?—Answer. Very little; I live in the foot-hills.

Q. You are familiar with the *débris* question and live very near to the country where the land is injured; to what extent are they injured?—A. I should judge there was about 12 sections of the land injured on the Yuba River.

Q. What is the nature of this injury?—A. It is a light deposit of land slickings or loam that settles into the valley and strikes where the grade is low. There is a large portion of that which is covered that will raise very good grain now as well as corn and potatoes. Where the sand covers the land the injury is permanent.

Q. Is it not?—A. Where it is covered with slickings the land after a few years can be used again if the water can be kept off of it.

Q. Have you any suggestions to make concerning relief in this matter?—A. Nothing more than the construction of good levees in the valleys to hold back the *débris*. In the mountains and cañons on the Yuba River there is about 8 miles of the river, about 1 mile wide, where if dams were put in they would hold a large portion of these larger tailings before it comes down onto the plains below. Large portions of this stuff that has settled around Marysville to about 6 miles is caused by the growing of willows. The water rushes down there and it deposits the material after holding it from the mountains. There is not more than one-half of the 12 sections of land that is covered with sand and the other half covered with slickings. There is a line of levees on both sides of the Yuba River from Marysville to the foot-hills. The miners built one line of them on the south side and the farmers built the other. The levee that the miners built is about 7½ miles long, and that is the extreme end and where there is no damage. The damage only extends about 7½ miles east of Marysville on the Yuba River. The levee is built about one section back from the river, and the levee on the north side is about the same width, it being about 2½ miles between the two levees.

Q. How long have lands that have been damaged been in the possession of individuals?—A. A large tract of land on the south side of the river that is covered has been in the possession of the parties that own them now about sixteen years. The owners of this land in 1862, in the freshet, left them; and the parties that have them now, they got them by tax titles. There is one tract of 2,200 acres, and I should judge that 2,000 acres of that lie between the levee and the river, and possibly 200 acres lie south of the levee. All of that property was got by tax titles.

Q. When was the damage done?—A. The greatest damage was done in 1862; we had a very severe freshet that year.

Q. Generally speaking, at what season of the year is the damage done?—A. In the month of January—or probably from January to February is probably the time of the greatest freshets.

Q. What do you think of the policy of continuing the mineral reservation?—A. I think it would be wise to continue it as it is.

Q. Don't you think it a great barrier to the progress of the agricultural industries?—A. I do not know that it is a great barrier or hardship to prove the mineral off. Now I think it is advantageous to the mining industry, and I think it leaves a better field open for prospecting and development of the mines.

Q. What do you think of the policy of shortening the time that a man can obtain

title to mineral land?—A. I think it would be very advantageous. I think the time allowed now is too long.

Q. What do you think of the effect of organizing mineral districts and putting the districts under the local laws here, then leaving them to be worked on under the United States law? Are local laws of any advantage to the country?—A. They have been, but now I don't know but that they create more litigation than there would be if they were done away with and the United States law prevail entirely.

Q. Have you had any experience in quartz mines?—A. No, sir.

Testimony of George Ohleyer, Yuba City, Cal.

MARYSVILLE, *October* 28, 1879.

GEORGE OHLEYER, residing in Yuba City, made the following statement:

I have lived on Yuba River from 1858 to 1865, and since then I have lived in Sutter County.

Question. Just give your opinion of the depth and lateral extent of the *débris* which has been carried down since the hydraulic mining commenced.—Answer. I was living then, before there was any trouble from hydraulic mining and before there was any hydraulic mining, a man, or anything on the Yuba River, about four miles from this city. My occupation was farming and threshing. In early days people did not want the high plains here, they being very dry and worthless as farming lands; so consequently everybody applied for a piece of bottom land; the result that this Yuba Valley was thickly settled from the left of the Yuba to the foot-hills. I am not positive as to distance, but I think it was eleven or twelve miles. This valley bottom land, I should judge, was an average of two-and-a-half miles wide. It was thickly settled and was as fine land as I ever saw. In many places it was cultivated right up to the banks of the river and was cultivated along its entire length.

Q. How many people were in the neighborhood and valley at that time?—A. I think there was, on an average, a family with hired help, &c., or perhaps twenty-five or thirty persons to the square mile.

Q. Are there any of those farms leveed?—A. There is not a foot of one, and the people have abandoned their farms, many of them have died, and others have moved away because they have nothing left. During the years 1858-'61 I threshed on both sides of the river, from the mouth of the Yuba River to the foot-hills. I threshed wheat, barley, and oats all along, and could raise corn and vegetables too. All these farms have pretty good buildings on them.

Q. What was the character of the buildings?—A. They were mostly frame buildings—some of them had fine two-story houses and three-story ones, different and similar houses, and they had barns, which were well fenced, and had very expensive orchards and vineyards.

Q. What would that land be worth per acre, with improvements on it, if it was recovered to-day?—A. I think a reasonable view of it, in consideration of the orchards and vineyards, would be $100 per acre. Some of the grain might not be worth, were one exchanging hands, for $100 per acre. A portion of this land, which was covered with buildings then, is now covered with sand. I made a statement before on this subject to the committee, and I will read the following statement which I made and which was printed in one of our newspapers, showing the immense losses that had been sustained by farmers in the river valleys by the inundations of sand, water, and sediment at that time. They are as follows:

Twenty-four sections of land destroyed on the Yuba River—15,360 acres—valued at $200 per acre	$3,072,000
Personal property and improvements	3,000,000
Loss and depreciation of property in Marysville	2,000,000
Destruction on Feather River	500,000
Eighteen sections on Bear River—11,520 acres—valued at $100 per acre	1,152,000
Destruction in Yuba County	9,724,000
Assessed value of all property in Yuba County for 1875	5,025,720
Assessed value of all mining property in Yuba County in 1875	298,600

Destruction of property in Sutter County:	
Eighteen sections of land on Bear River—11,520 acres, valued at $100 per acre	1,152,000
Personal and improvements	1,000,000
Destruction in southern portions of the county, Coon Creek, and Anourn Ravine	500,000
On Feather River on both sides	500,000
Total in Sutter County	3,152,000

This rather underestimates. Since then this backwater that has been spoken of has injured on Feather River all my land above the confluence with the Yuba River. Below there are many fine orchards that are totally ruined, and below as far as the mouth of Feather River two millions are almost ruined. It is unsafe to do anything with them. These we attempted to farm, and, having continuous loss of money, most of them failed financially in trying to do anything with the two millions on Feather River. Total in Sutter County, $3,152,000. I also estimated that the amount already spent by the building of levees to protect what was then not wholly destroyed, $1,000,000, and I claim that at that time the levee works were still protecting property that was worth $20,000,000. They had attempted to keep out Feather River at very great expense, but in many places the levee is all banks, and if it keeps on filling as it has for the last few years we must levee, or we would have to keep building artificial banks, or it will overrun us.

Q. The Feather River, then, has entirely filled up its old channel?—A. Not entirely; but in many places where banks are low it is entirely full.

Q. Does the water at low water flow against your levees?—A. Yes, sir; in some places. I am connected with a farmers' co-operative union, and in 1874 there was a big warehouse building and the floor was but one foot higher than the levee. The levee was built, I think, in 1868, three feet above high water, and we put the floor of this warehouse one foot above the levee, and we now have found it necessary to add three feet on the top of that levee. This is right in the town, and the water reached over that old height in 1878 where it hadn't been raised. This was last winter, and it was not a very great winter for freshets either. The bridge that was originally on a level with that levee, and perhaps higher, the county supervisors are now raising six feet.

Q. Do you think that the *débris* goes back on Feather River or crosses it?—A. Well, it crossed to some extent, I think, below this levee. I have not seen much evidence of it, though. I have seen some, say 18 miles down the river, as much as three or four miles north of Feather River. It does not come out of the Sacramento, because that is comparatively pure. It would come in here all the year round if it was not for the levees. If the water was clear we would not mind a particle, or we would not complain of the *débris*.

Q. Does your statement include that district of country between the Bear and Yuba Rivers?—A. My statement just made only included the Bear River Valley. It does not include the stretch of country between the Bear and Yuba Rivers proper.

Q. To what extent are the lands injured between the Bear and Yuba Rivers?—A. Where they are protected by the levees there is no material injury; but they would be certainly overrun by the *débris* but for the levees.

Q. How far back from the river is the levee?—A. On the south side I have not been for some years, but on the north side I saw them recently; it is a considerable distance.

Q. What land has been injured on Feather River?—A. Taking the bottom land along Feather River, and between the Bear and Yuba Rivers, it is injured some, but I have not been on this land for some time. There has not as much injury been done as to the land on the Bear and Yuba Rivers.

Q. Is that country leveed also?—A. On one side, where the water backs up.

Testimony of D. A. Ostrom and others, Wheatland, Cal.

D. A. OSTROM, of Wheatland, Cal., testified at Marysville, October 27, 1877, as follows:

I have lived in this State since 1850.

Question. How long on Bear River?—Answer. I first came on Bear River in February, 1852.

Q. You are familiar with the farming operations on Bear River?—A. I am and have been. I would state that when I first knew Bear River it was a pure stream of water, clear at all times, in flood times as well as dry, and it continued so until about the

years 1861–'62. There was no very perceptible change until the winter of 1861–'62, when there was quite a flow of tailings and *débris*, as we call it, which filled a good many smaller sloughs that usually carried most of the flood water in flood times, and partially filled the channel of the rivers but not entirely. The channels continued filling up to date. My knowledge is extensive. I was familiar with the land five years prior to that, and I think that the settlings of these tailings and *débris* has been going on in an increasing ratio year after year ever since the years 1861–'62; so that the water coming down Bear River contains perhaps four or five and possibly ten times the amount of tailings now that it did in the year 1865. It comes in an increasing ratio each succeeding year. When I first knew that country the bottom lands were all the lands that were cultivated, and not all of them was under cultivation. That was the only land that was considered valuable in those early days. Compared to the high lands, which is now farmed, and which will raise what we now consider a fair crop, it was valuable, while these high lands were considered worthless in our estimation.

The Bear River valley was from one and a half to two miles wide. That would be a fair approximation up from the mountains to its entrance into the Feather River, which I believe would be at a rough approximation something near sixteen miles from where the river debouches from the foot-hills to its entrance into Feather River. That was a very thickly inhabited section, and it was very rich land; it was the garden spot of California, and was thickly dotted with fine homes. There were some four or five school districts within six miles up and down the Bear River bottoms. To-day I think there is but one little school-house in that section of country and it looks terribly dilapidated. The population have almost all gone. The value of the property along the rivers in Yuba and Sutter Counties, with the ordinary increase in value of property, would by this time be almost incalculable. That land in the condition in which it was would reach, perhaps, the price of a hundred dollars per acre on an average. There is no doubt but at that time it could be readily sold for that sum. Now, if it was in the condition it was before this overflow of *débris*, it would sustain a population as great as that of the most productive spot on the earth that I have ever seen. It was even then thickly settled; almost in every instance a farmer on a quarter section was doing well; to-day I do not believe there is one-twentieth of the population that was there at the commencement of this overflow. I have been almost as well acquainted with the Yuba River and the city of Marysville since 1862 as I have been with the Bear River Valley, and I have been something of an interested observer of this thing from the first. I have watched it closely, and I think the Yuba River bottoms are larger and more extensive than those of the Bear River, with equally good soil, lacking only in one particular. The Yuba bottoms were covered with underbrush, and it had to be cleared out at a cost of from $20 to $30 per acre. With that exception I should class the Yuba River bottoms as equal in value to those of the Bear River, and they were held and used in the same manner as the land on the Bear River, which I consider the best body of land I ever saw in my life. A description of one will answer equally well for the other. The Yuba River from the foot-hills to its junction with Feather River is not so long as the distance along the Bear River from the foot-hills to the junction of the Bear River with the Feather River, but I should say it was somewhere from ten to twelve miles. The land along the Yuba River is perhaps wider than the land along the Bear River, and would average about two and a half miles, making, perhaps, as large and possibly a larger area than the Bear River bottoms would. It was very productive, and some of the largest orchards in the world and many smaller ones were there. The Briggs orchard, which was one of the best, is now a waste of sand. The population of Yuba River bottoms has decreased in as great a ratio as that of the Bear River Valley. In fact it will complete the depopulation of these river bottoms if this thing continues.

I heard a gentleman state in regard to the overflow of 1862 that it was a noted water year. It was one of the heaviest floods we have ever known in California, overrunning a great portion of these bottoms, perhaps the greater portion, but to my knowledge it did no damage. The water was clear and pure; the only damage it did (which in those early days did not amount to a great deal) was the removal of a little fencing, or something of that kind. If we had a flood to-day as great as that of 1862 the water would, in my opinion, reach up to the first floor where we are sitting, in the streets of Marysville. I doubt if the levees which are being constructed would be sufficient to keep back the flood, and, as I have expressed myself to citizens in Marysville here, I do not think they can build a levee to withstand these floods, neither here nor in Sacramento City. In regard to this filling: I have been acquainted with hydraulic mining. As an old Californian I have been through the mining districts a great deal, and have seen hydraulic mining perhaps in its incipiency, and until they began to pipe these hills I saw no *débris* in the streams; not until hydraulic mining proper commenced with the great force of water which they bring to bear, and their perfect machinery with which they are literally melting down these mountains. They undermine a bank and place in it a charge of powder, and bring down immense

quantities of earth, and then carry that off with water. They are really precipitating mountains down upon us. That is the way to express it.

I read some statement made by a gentleman in San Francisco, with whom I am somewhat well acquainted, having lived near him some years, and as it is a little contradictory to the statement I have made, I wish to refer to it:

Mr. Von Schmidt made a statement I remember that vegetables could not be successfully grown at all until the accumulation of a certain amount of this *débris* upon the land, and that they had never been successfully raised without it; that it was impossible to raise them.

Now, with the utmost deference to Mr. Von Schmidt, who has some reputation as an engineer, I wish to say that prior to the overflow of this land by this *débris* there were better vegetables and more of them, and that it was ten times as easy to raise them; and they were far superior, infinitely so, before this overflow to what they have ever been since. It is true they raise good vegetables now; and I would call your attention to this fact, that they only raise them on the portions of the land that have been protected from this overflow.

Q. Will the levees protect these lands?—A. Many gentlemen are working away, building levees, &c. My experience teaches me that it is almost a fruitless effort. A farmer with a tract of this bottom land upon which at favorable times he can raise from forty to fifty bushels per acre, valued at a dollar a bushel, undertakes to build levees to keep off this water, with its steady increase of tailings from year to year. I think it will take every cent of his profits, and perhaps more, to do that; until finally, as I have seen over and over again, there will come a little extra flood and sweep it away, and utterly ruin the land. I know farms on Bear River that cost from twenty to forty thousand dollars the owners of which are as poor to-day as church mice. This was all caused by this *débris*.

Q. During what season of the year are these flows?—A. They occur, properly speaking, from 1st of April to the middle of summer; they vary from season to season.

Q. The injury is done at the time of flood, is it not?—A. The greatest amount of these tailings make their appearance here during the winter season; it is thrown out of the channels at that time. Apparently—I flattered myself the same way—we have a washing out of our channels, and it appears as though it would work out; but the following summer we find that the channels are raised perhaps two feet higher than they were the previous year, and we find the adjoining sand-beds on each side of the channel have been raised in the same ratio; that, as a matter of fact, the harm is almost altogether done in the winter-time. The floods sweep sand and *débris* out of the channels which have been filling up during the summer and spreads it out on the land, and the next summer other accumulations fill up the channel again, and the next winter spreads it out again over the land. This is the action of it, as I have observed it, with an increasing ratio from year to year.

You asked the gentleman who was making a statement a little while ago in regard to the width and the widening process of these sand-beds. You saw it here where you crossed the railroad. The widening process has now reached a point where it has become very rapid; more so from this very fact: these river bottoms were originally something of a trough, into which you came down from the plain lands, and as you came down from the plain lands into the river bottoms perhaps it would average eight or ten feet. These high lands were higher than the bottom lands proper.

We now find it in this condition: These bottom lands or troughs have filled up until they are almost as high as the highlands adjacent; in many places as high. In one place the Bear River, for a mile or a mile and a half below the railroad, has widened over two miles, and for the last five or six years has flowed over a ridge of the high-land that in the great flood of 1861–'62 was high, but which it now flows over at low-water mark.

The levee which Mr. Keyes built afforded protection at low water, but I believe it broke last winter, and it has widened again indefinitely. My opinion is that it is only a question of a short time when this whole upper Sacramento Valley (and I speak from experience) will be simply a swamp and willow thicket and a waste. Perhaps this will extend over most of the Sacramento Valley. It will be some little time before that will occur, but the water will eventually fill up these channels.

I wish to refer to another proposition while I think of it. It has been said that there is a great deal of wash from the plowing of land, and a great deal of stress has been placed upon that; and some of our most skilled engineers, men of perhaps national reputation, have advanced the idea that the plowed land has done a large part (if not the greatest part) of this mischief.

Now to disabuse this Commission of any such opinion and to show the absurdity of that idea it is only necessary to go to any of our streams that have no hydraulic mining on them. That would be a fair test. I live out here on a stream we call Dry Creek. There is no hydraulic mining on that creek. I have known it for the last twenty-six years or more, and I have been farming on it; and I give you my word it has not filled over three inches in all that time, nor is there ever any muddy water in it. On

the borders of that creek for the last twenty years there has been the most successfu farming, and as successful grain farming, too, as there has been in Upper California.

The absurdity of the idea could be better proved if you could possibly spare the time to take a little trip over the agricultural districts during one of our most violent rain-storms. You would then see a great deal of water on the flood land, and you would see it every time absolutely clear.

I refer to every farmer in this room if this is not the fact. Why is it so; because it has flowed over flat land, and there is nothing to create a commotion. That is the effect, and the very small amount of cultivation that is going on in the foot-hills it is not worth while to consider, because it does not amount to anything in the way of filling up these streams.

Again, there is another point: Some gentleman in making a statement before the Commission referred to the roads that had been dug in the mountains. I have traveled over these roads year after year, and do so still, and it is my opinion that if the roads that send down mud into the channels of the rivers of Colfax County were taken together the *debris* would hardly be perceptible. I do not believe that it is one hundredth or one millionth part of what constitutes the *débris* does come from the roads—not even if you include these washings coming from agricultural lands in the foot-hills.

The flat plains lands were settled first, because they were the productive lands of the country as then considered. In the early days of California there was a great deal of what we call low lands that would produce a fine crop of wild hay that was worth more than the very best wheat land, and these bottom lands along the rivers all produced this wild hay or grass. Now, in addition to that, I would say that these lands were really the most productive grain lands that there was at that time in the country. I have harvested 100 bushels of grain, and again over 70 bushels, and again over 60 bushels of grain from this quality of bottom land.

I am not an engineer, nor am I skilled in the technical phrases in regard to the different qualities of soil, but these bottom lands were different in every respect from the other lands. Under our highlands and in fact almost the whole of Upper California we find an underlying bed rock, or hard pan, from 2 to 6 feet deep. In almost all of Upper California it is so. The tules have this same sub-stratum, and between the Feather and Sacramento Rivers you will find the same hard pan underlying the land.

These bottom lands have no such strata. The winter floods bring the water to this quicksand subsoil which, in the bottom lands, takes the place of the hard pan, and up through this quicksand comes the moisture as it is carried along, so that in the morning you find a dew on this land; but when you go back fifty yards on the highlands you find nothing of the kind, but the dirt is as hard as a brickbat.

As to the different qualities of the soil, I do not know anything about that.

A gentleman made a statement in regard to the rivers filling up. I had the honor of conducting an investigation under the authority of the legislature at the last session, and I have a copy of the testimony here of skilled engineers and of men who have been familiar with the river and its channels and its changes since the year 1849.

The testimony of one of them relates to that one point; and in the matter of navigation I wish to call your attention to the statement of Captain Albert Foster, who was in the employ of the Steamboat Navigation Company at Sacramento City. He has been in their employ for ten or twelve years, and prior to that he was on the upper rivers, both the Sacramento and Feather. His statement is as follows:

"Captain ALBERT FOSTER sworn and examined.

"My occupation is that of a steamboat captain; I have been acquainted with these rivers since 1851; I have run on all the streams, but more particularly on the Upper Sacramento and on the river between here and San Francisco.

"Question. Describe the changes you have noticed since that time.—Answer. Well, starting from the Upper Sacramento, I can notice no filling in there since the time I commenced running; I had soundings, but I haven't them; I have soundings taken on the river all the way from the mouth of Mill Creek clear down to September, 1851. I have found shoal places below Wright's place at that time which I have never seen since. The banks up there are of such a nature that in high water they kept cutting and the river kept changing all the time. Still, the current is such that the bed would not fill. I would not change much from Captain Pierce's statement until you get down to Knight's Landing; from Knight's Landing down to Fremont the Feather River backs up the water so that now we run over places where in 1851 were dry bars. There are bars there now, but there is water enough, from the backing up of the Feather, to enable us to run right over them. The filling in of the river from Fremont, down all the way to the Feather River, is much more, I think, than many of them think. I have some facts in reference to this river immediately in front of this town. In my judgment, in 1849 the river would average about 24 feet from shore to shore, in front of the city here at Sacramento. I sounded the river to-day so as to give facts. The lowest water of 1869 was 2 feet 9 inches above that of 1849; in speaking of 1849, I

refer to the gauge that has been kept here—the '49 gauge; that was here before there was any perceptible change in the rivers. The lowest water in 1869 was 2 feet 9 inches above that of 1849; the lowest in 1874 was 4 feet 9 inches above that of 1849; the lowest water in 1875, October, was 4 feet 5 inches above the '49 gauge; the lowest in 1876, October, was 7 feet 1 inch above the '49 gauge; the lowest water in 1877, in September and October, this last fall, was 5 feet 3 inches above that of 1849.

"Q. Now, as to the seasons; how did the seasons prior to this time compare—were they drier or wetter?—A. I think never but once since I have been here was there less water in the river than there was this past season—1877. At that time the difference was 5 feet 3 inches. There was an average depth to the river along the city front here in 1849 of 24 feet at low water. This depth extended nearly clear across the river. The average depth in front of Sacramento in 1878 in low water would not exceed 8 feet; and as the water was 5 feet 3 inches above that of 1849, it would show a filling of *débris* equal to 21 feet 3 inches—solid filling in. I have made soundings to-day, starting on the Sacramento side and going on a line below the piers across to the Yolo side, about two hundred feet below the bridge; we sounded between the piers. We found by these soundings 45 feet of water on the Sacramento side, next 42, next 36, next 36, and last 30. Again opposite I street we started with 45 feet; next sounding, going across, 38 feet; next 33 feet, and the last 33. Opposite K street the first sounding was 36 feet, next 36 feet, next 30 feet, and last 24 feet. These were made, all of them, in a straight line across the river. Opposite M street the soundings were 30 feet, 27 feet, 30 feet, and 21 feet. Opposite P street, 27 feet, 27 feet, 27 feet, and 21 feet. Opposite the gas-works, on Y street, 30 feet, 27 feet, 21 feet, and 18 feet. This gives an average of 30 feet 5 inches on all the soundings. The water on the gauge was 22 feet 1 inch—on the gauge at the time, at K street. The soundings were both above and below that gauge. The average depths, compared with 1849, would be 8 feet 4 inches. Deducting 22 feet 1 inch shows that the *debris* at this time is 15 feet 8 inches more than it was in 1849. The scouring away during this flood, according to these figures, would be 5 feet 7 inches; that is, from bank to bank. The washing out has been 5 feet 7 inches during this last flood. That will overrun, take it all along the river. It has scoured out more than that, take all along the river. This shows that the flood has scoured the channel out on the Sacramento side here about down to the original channel of 1849, but it has not done so on the Yolo side.

"Q. From your knowledge of the river, have other deep places filled in in about the same proportion?—A. Yes, sir; about the same.

"Q. In early days about what proportion of the river-beds was occupied by bars and deep places?—A. There were very few bars—what we call bars—in early days. There were shoals—the Hog's Back and several bars down that way. I suppose we would carry an average depth of three or four fathoms of water in early days—all except these particular shoals I speak of. The average now, I should say, would not be half that much. These bars and shoal places are much shallower now than they were then.

"Mr. GARVER. How much has it raised at Hickox Shoals?

"A. Well, we have, as against 11 feet, less than 6 feet this last season. The *débris* has raised, I think, more in proportion, because the water don't go as low in its banks. But where we would have 6 feet at low tide this year we used to have 11 feet.

"Mr. KERCHEVAL. Speaking of Hickox Shoals, you say now the relative condition is as 6 to 11?

"A. In the channel.

"Q. So in early times you went almost anywhere?—A. Yes, sir; we generally made about one crossing. Where there is a dry bar this summer we generally had 8 or 9 feet in early days.

"What do you think of the relative carrying capacity of the river, take it from Sacramento down to the bay, compared to 1849 and 1850?—A. Well, it is in times of flood perhaps one-quarter less, may be not that much difference. The water now from the first rise goes off quickly, more so than the same amount of water in 1849, because there is more fall.

"Q. Do you notice any difference in the tides?—A. Yes, sir. The tides in 1849, I have seen schooners swung upstream right here in town. Then the tide used to go from 20 to 30 inches. The tide at Fremont used to be from 10 to 12 inches. At Knight's Landing it was perceptible—some 3 or 4 inches—so it would show on the bars. The tides this last season—I do not think our highest tides exceed 8 or 10 inches here at Sacramento. Only a very full tide is seen at all here. Full tides swell the river a little.

"Mr. GARVER. How is the water on the Hog's Back bar?

"A. There is about the same difference in the depth of the water. There has been a wing-dam there. But at low water it is not over 6 feet on an average. I have not been there to sound it for two or three years. It used to carry 11 feet, in high tide, in early days.

"Q. Is it not more than 6 feet now at high tide?—A. Yes, sir; but 5 feet at low water.

"Q. What is the average tide there in low water?—A. I know they used to figure on it, and came up there with vessels drawing 11 feet of water; it must have been more. I don't know the average tide there in summer.

"Q. Did not a schooner sink there in early days and obstruct the channel?—A. No, I think not.

"Mr. OSTROM. What is your opinion about the *débris* filling the bay?

"A. It is noticed at two points, in places where there is slack-water. In the main channel I think there is but little difference in the depth. At Seal Island, I think, there is less water there now than in 1849. The channel is about the same.

"Q. You think the filling that takes place is around the edges of the bay?—A. Yes, sir; in slack-water.

"Q. What is your opinion in regard to this relief canal, so called?—A. Well, it is no new opinion. I have always advocated the building of a canal here on the west side of the Sacramento, so as to carry the natural overflow of the Sacramento River from above Colusa. They could do that, I think.

"Q. About what width such a canal would require?—A. With these large floods there would not be much danger of their getting it too big. I would not build it less than 600 or 1,000 feet wide.

"Mr. KERCHEVAL. Now there has been some talk of cutting a canal up at, I think, Gray's Bend, cut into the river, digging it from 300 to 1,000 feet wide, cutting the bank down 6 feet, and put weirs in so the water would pass over. Now I want to ask you what effect the diversion of that amount of clear water would have in decreasing the scouring forces, thereby enabling the Sacramento to keep itself clean of the sediments coming from the mines?—A. I believe every particle of water that you take out of the river that you can force to go through decreases the scouring capacity just that much.

"Q. Will not diverting this clear water have that effect?—A. In high water the water is quite muddy that comes down the Sacramento. In low water it is clear.

"Q. Now, my proposition is to take it out below the mouth of the Feather River, so as not to take the clear water.—A. Well, in taking the overflow above Colusa, flowing toward the Feather River, also from the Feather River, it fills a very large basin of water there. My idea is to reclaim that, to cut a canal through there. In doing so, if they carry that water in a canal, they have to strike the Sacramento River above Fremont. In doing that it would necessitate the cutting of a bank and making the canal from the opposite side.

"Q. Would it not be better to take the water out below the mouth of the Feather River, in order to divert the clear water entirely?—A. I am satisfied that the water below Fremont is muddier than above, so that a canal running out below Fremont would carry more sediment than one taken out above; in high water, however, not to any great extent.

"Mr. WATERS. Did you ever figure on the probable cost of a canal that would carry such a flood as we have had?

"A. No; I have guessed two or three times. I think it would go up into the millions. I think one of the hardest things to attain is in making the banks of the canal stand. I think the same trouble would be found in trying to keep the water in the Sacramento with levees. I consider it is impracticable to levee against the water of the Upper Sacramento River, because I have seen the banks cut away in one rise, in one place, 100 yards to the depth of 25 or 30 feet; and the more you confine these waters the more they will drive into the bends. It will go half a mile to a levee and cut through it. If even you could build the levees high enough, they would undermine and cave in. You would never know when you had the levee far enough away. As you get down this way there is less current, and the levees are less liable to cut. I believe it has been shown that the river will carry from 24 to 25 feet, and I think it is policy to make the river carry all you can. If you could take the water by this canal straight across and empty it into Suisin Bay, where it would not back up the water of the Sacramento, that water would get down there and spend its force before the rise in the Sacramento would get near to the bay. It would have a shorter cut and a great deal more fall than the Sacramento.

"Q. Did you ever make any calculation on this basis? I understand the fact to be that the upper end of the streams are all of a higher grade than down here?—A. Yes, sir.

"Q. Now, how big a canal is it going to take to carry the water up there so as to keep it from overflowing? We find just so many gallons per hour passing here. How deep a canal is it going to take?—A. Well, if your canal is ready to work as soon as the water comes over the banks it is ready to travel off in the canal. It will not work as it does now. Now it fills up in the tule lands above Knight's Landing. It gets that full, so that it is two or three feet higher than in the river. Then it breaks through and comes down to the next district, and so on down. I noticed the other day, down at the islands, at the foot of the island it must have been two feet higher than the river itself. It breaks over and runs down inside of the levees, and thus breaks through one place and another. If they had no levees at all the water would not have gone near

as high at Grand Island, in my judgment. I think there was not as much water as there was in 1862.

"Mr. KERCHEVAL. Now, as a relief, not full but partial, what do you think about cutting a canal through the Montezuma Hills, and meeting the tide-water over at Denverton?

"A. I think if a canal was made there it would relieve you down about the islands in such time as this—in fact, all the overflowed lands down there. We have a foot or eighteen inches more water in the Sacramento to-day than we would if it was not for the rush of water going off Caché Creek Slough. It forms a regular dam. It backs the water up as far as here. The current is not as strong in the river now as it was two weeks ago. This checks the current and prevents us getting rid of the waters—commences the stuffing process. Take Old River, and it is slack-water there now. There is no current at all this side of the Montezuma Hills. The sediment, with this current here now, travels on down to the slack-water and there it will fill in.

"Q. There is a terrible current down at Caché Creek now?—A. Yes, sir. A barge came up, and had to make three trials to get up. In 1864, in the measurements I made in the big flood, we had 34 feet at the Wright Place. It spreads out and drops very rapidly. Just in the cañon above there they had 45 feet. Take it near Princeton, and the average depth would not vary much from 24 feet. When you get here it decreases, and at the head of the islands they had 24 feet on an average—14 feet 6 inches above low water. As you go on down it is not more than 2 or 3 feet above the highest tide, so when you get below there you don't notice it. In the straits of Carquinez we only noticed a rise there of some 5 or 6 feet above high tide.

"Q. What effect does this sediment have, or did you notice any material change in the American River?—A. We used to have quite a little river here in early times; now there is none

"Q. What effect does the filling of the American River have on the city of Sacramento here?—A. The more it fills up the easier it will overflow, making it necessary to build higher levees. It would not make very much difference as long as the levees are away above whether it fills up or not.

Mr. OSTROM. You are acquainted with the Feather River. Can you make any statement in regard to the Feather, the navigation and the condition then and now?

"A. I have not navigated the Feather River but little of late years. I have been up but once or twice, within the last five years, in low water. I will say that the Feather River is not as low, does not go as low in its banks, take the average from Fremont to the mouth of the Yuba. I don't think it goes as low in its banks by 8 feet as it did then. We have no shoal water now. There is not more than two-thirds the water in it now that there was then, because the whole river-bed has filled up. The shoal places are no shoaler now than they were in 1849; but it confines itself to a canal now, whereas it used to be quite a river.

"Q. It used to be that the steamer Governor Dana ran on this river in summer time?—A. Yes; they used to run the boats in summer. This is the Governor Dana, No. 3. This new boat is about 160 feet long, and the old boat was only about 115 feet.

"Q. What is the difference in the draught of water?—A. I think the old boat used to carry not less than 20 inches of water, perhaps nearly 2 feet. She never went up in low water. The second Governor Dana used to go up in low water; it was about a 15-inch boat. The present Dana draws heavier; she draws about 22 inches; called a 2-foot boat.

"Q. About how much would you average the filling of Feather River?—A. There used to be a good many deep holes there. The average filling of the shoal water is, say, 6 feet right at the mouth of the river. But if you take the deep holes, and there used to be a good many of them, the average from the mouth to Marysville would be at least 12 feet. The carrying capacity is filled up or decreased about 6 feet.

"Q. Does that include the whole filling along the banks?—A. There are a great many bars now where there used to be none. The carrying capacity between the natural banks, without reference to any cubic measurements, would be at least one-third less than it used to be right at the mouth of the river.

"Q. Would the same rule hold good as far as Marysville?—A. I think it will hold good as far as Marysville.

"Q. About how deep were the banks of the river in former times?—A. In places it would go over 20 feet. There are other places where there is not over 18 feet. There are places where these banks vary with the width of the river. Some of these people built their levees without a surveyor, and the floods go right over them because the river varies more in high water than it does in low water; it will change. Even surveyors find they have to make calculations for the bends. I presume the height of the banks at the mouth of the Yuba and the mouth of the Feather would have been about 20 feet.

"Q. You stated that you thought there was not more than two-thirds of the water coming down the Feather River. How do you account for that?—A. It is used up in mining and for different purposes, mining mostly.

"Q. It has been suggested by one or two witnesses the loss was to be attributed to the water seeping through the sand.—A. There is no doubt but that has something to do with it. This light sand all carries more or less water.

"Mr. GARVER. Has the river scoured down this winter to its original channel?

"A. Take the average from shore to shore it has scoured down 5 feet 7 inches. It has scoured out that much since the low water of last summer.

"Mr. OSTROM. Is it not your experience that these rivers scour out in time of high water, and then fill up again in low water more than they were filled before?

"A. I think the fill is not so great now as it was several years ago, on account of the increased grade."

Report of the committee on mining *débris*, twenty-second session general assembly of California.

D. OSTROM, *Chairman*,
REUBEN KERCHEVAL.
BYRON WATERS.

I wish to impress upon the Commission that this is sworn testimony.

Captain Foster testifies that the Sacramento has filled 22 feet up to the year 1877, and at the mouth of the Feather River it has banked up until it dams back the water of the Sacramento River some 12 miles up the Sacramento River.

Another gentleman, who was then running a steamboat on the Sacramento River, states that at the Hog's Back, and along for a number of miles above that, the channels they run in are pretty nearly as deep as they had been. Perhaps they had lessened some few feet in depth, but they had closed in some three-fourths of a mile or more. In other words, where the river had formerly a carrying capacity of a mile in width and 16 or 20 feet in depth it now has a carrying capacity of less than a quarter of a mile in width and 4 to 6 feet in depth.

The same might be said of the Sacramento River. While the carrying capacity along the city front has increased 8 or 10 feet or more, on the other side of the river it has decreased, and the average amount which the river has filled is some 22 feet or more; so that the carrying capacity of the channel is on the Sacramento side of the river.

A gentleman also stated that he thought the filling was not in the shallow places, but he said it was only filling in the deep places. I would beg leave to say that while I am not an engineer I can see that it fills from both sides of Feather River, and it fills rapidly. Where there was water fifteen years ago 15 feet deep willows are growing to-day and high water flows over the tops of them. That can be seen at any time; and it is not in one spot, it is all the way to a greater or less extent.

That Commission to which I refer also took testimony in regard to the filling of the harbor of San Francisco, and this testimony corresponded to some extent with some statements I have seen brought forth by the Coast Survey recently, that Suisun Bay was rapidly filling; that there was a large area on the borders of the bay that the tide now hardly ever reached the surface of where was formerly deep water, and that this filling of the harbor is rapidly going on.

By Mr. CRADDOCK:

Q. If Mr. Ostrom will permit me, I would like to interrupt him a moment. The fact I wish to call attention to is this: there has been some contradiction in regard to this sedimentary deposit which is brought down by the water. You have had some little experience in farming it yourself, and I would ask you this one question: If the land is susceptible of cultivation, will it be where it is covered with the *débris* to an extent that a plow will not reach the original soil, say, plowing from four to six inches deep—is it susceptible of cultivation in that case?—A. My experience would only correspond with that of gentlemen who have farmed this class of land; and while I have heard the statement that it is susceptible of cultivation, I slightly disagree with it; and, so far as has been developed, the exception only proves the rule, and that rule is that this class of land, notwithstanding all the chemical forces that may be put upon it, will not produce if it goes to a depth of ten inches. There is no producing quality in it for grain. If you can reach the original soil and intermix that with this sedimentary deposit, perhaps you can raise a crop after a fashion, but it is not a good crop. One class of this *débris* is sand, and which is devoid of all producing qualities; it is an entire waste, in my opinion, even where it is four inches deep. I consider it a very great injury.

I wish to state one thing more: There has been a statement made by Mr. Redding (at San Francisco, I believe)—and he pretty much the same statement before this committee—in regard to disposing of these tailings; he said it might, by engineering skill and proper plans, be put upon the tule lands between the Feather and Sacramento Rivers, south of Bear River. Now, while that may be done, I rather doubt it. I think it would be far easier to retain it in the foot-hills for this reason: That in endeavoring to carry it into these tules (if it was desirable to put it there and it could be done) you fill up your channels in the summer-time, and you can only keep your

water in that channel by levees. Whenever a flood comes that channel is filled up, and it overtops your levees, and it is all gone to destruction. If Mr. Redding or any other man can show me how they can prevent this filling-up of the channels then I may believe in the filling-up of these tules, and they can accomplish one whenever they accomplish the other.

Personally I do not know that I have anything further to say. I would take the liberty of filing with the Commission the report of that committee.

Testimony of William H. Parks, Marysville, Cal.

Mr. WILLIAM H. PARKS, of Marysville, testified, October 1, as follows:

As regards the applicability of the present system of homestead and pre-emption to the wants of the country, I am of opinion that it would be expedient to retain the pre-emption law, with an amendment doubling the quantity a man has a right to pre-empt. I would make it so that a man could file his pre-emption claim before survey, and then require him to conform to the survey as afterward made, which is practically the law now. I would then offer all the land at public sale, as the old law used to. After the offering of the land I would leave it open to private entry; at the same time I would still retain the pre-emption law to this extent, that a man might have it when he completed the payments on his land; that is to say, I would open it to public entry or pre-emption as a man saw fit to take it. If he bought at public entry, he could buy an unlimited quantity; if he wanted time to make his purchase of the government, which time I should be in favor of giving him, he should confine himself to 320 acres. If he really wanted a farm under the pre-emption law he could pay for it. I would give him, say, a year. My idea is to enable every man who wants a farm to have an opportunity to get it. Under that arrangement the homestead law would be unnecessary, but I see no objection to allowing it to remain on the statute-books. After that I would give a man 320 acres more if the 160 acres he has is not sufficient for him to make a comfortable living for his family, for the reason that the profit in our staple article, grain, is not sufficient to enable a man to maintain a family on what he can raise on 160 acres, particularly on the Pacific coast, where they have to resort to the expedient of raising crops only every other year.

I see no objection to maintaining the homestead act if a man be allowed 320 acres, but I would so frame the law as to make it an inducement for the greatest possible number to go into agricultural pursuits; for, in my opinion, too great a proportion of the American people are professionally engaged, and there should be every inducement thrown out by the government to extend agriculture and reduce the number of people entering into professions. To illustrate: there are two mercantile houses where there should be one; double the number of attorneys there should be; double the number of doctors; twice as many people engaged in other learned pursuits as is necessary for public convenience, and public policy should be directed toward making more producers, and, by intelligent laws, we should make it an inducement for men to settle in new countries. The present system of land-parceling does not hold out sufficient inducement, and I would double the quantity of land that might be pre-empted and give plenty of time to pay for it, or double the quantity they should have under the homestead law either. After all have had an opportunity to pre-empt, then all should have an opportunity to come into competition for the purchase of land at public bidding. I would leave it optional with any one to buy it at the government price, *i. e.*, restore the old law about that.

My opinion is, as to the amount of wheat raised over the State, that the average would equal 16 to 18 bushels per acre. The average has been reduced in the State by extending farming to the least fertile lands, the red lands, where they do not yield to exceed 10 to 12½ bushels per acre, and that only every other year. The choice lands still maintain an average of 30 bushels an acre, and some of them go as high as 50 and 60. The cost of cultivating an acre of land, including harvesting, sacking, and hauling to the depot, does not exceed $12.50 per acre. It will bring on an average 90 cents per bushel. I make this calculation in the supposition that a man hires everything, machinery, teams, &c. When a farmer puts in his own labor and horses and machinery of course he reaps some little result. Even if he employs his team and himself he does not make much money. I think the cost of production will perhaps run a little less than $12.50 per acre.

Taking the public lands still remaining undisposed of within my knowledge, they are best adapted for grazing purposes. As a rule they are not adapted to raising cereals, with some few exceptions, and in the exceptional cases they can hardly be made available for raising cereals for want of transportation. There are some valleys undisposed of in the State which, had they the means of transportation, could be utilized

for grain-growing purposes. The foot-hill lands are adapted to vineyard and fruit-growing, but I do not think that industry can at present be prosecuted successfully, for the reason that there is only a limited market for our fruit. The wine interest is new and is entirely experimental, and our inhabitants not being accustomed to the wine business, many fail for want of knowledge, and no man with moderate means can take one of these farms as a gift, plant it to a vineyard, and make a living off of it and maintain himself until he can make a profit off his wines. I believe our soil is well adapted to vine growing, and when our State has a greater population to consume wines and a greater population to reduce wages it will become a great wine-growing State. At present I do not consider it a profitable industry.

The foot-hills are capable of producing fruits, but it is not known how far up the lands can be thus utilized. A very small proportion of the lands capable of cultivation can be brought into use for that purpose without irrigation. In fact there is not perhaps over one-third of such lands that can ever be cultivated except by manual labor; it cannot be done by plowing. Crops in this part of the State seldom fail for want of rain. The land is broken into small patches by rock. Water used in irrigation is derived from little mountain streams. There is no system of irrigation and very little irrigating done in the northern part of the State. It has been demonstrated that our fruits and garden products are much better without than with irrigation. The idea of irrigation has long been abandoned; cultivation is all that is required.

Our rainfall, which generally occurs between November 1 and April, averages from 8 to 30 inches in the northern part of the State, and at the extreme northern boundary sometimes runs as high as 36 and 37 inches. The rainfall of course increases as we approach the mountains.

It is almost impossible to say how much land is required in this section to raise a head of beef. There is no constant raising. Our pasturage has been found by driving stock to the mountain valleys and mountain sides, where they have unlimited range. There are no large herds of cattle here. A considerable portion of our beef is fattened in the valleys adjacent to and in the southeastern portion of Oregon.

To keep a flock of sheep well in this country between December and May in the foot-hills it will take an acre to the sheep, and then they must be moved either to the mountains or to the low lands for summer grazing. This would take about another acre, making two acres required for the support of one sheep.

The supply of water in this section is derived entirely from streams heading in the snow-clad mountains, *i. e.*, from natural sources. Nothing is done here in the way of obtaining water through artesian wells.

The general kind of timber in this section of country is oak in the valleys, and in the foot-hills what is called nut-pine. Then we have spruce and pitch-pine, and as you approach the summit of the mountains you come to the sugar-pine. I think I would dispose of the public timber lands by opening them to public purchases in quantities to suit. I should not impose any restriction as to the quantity one individual might buy, leaving the land open, however, to private entry at the government price of $1.25 per acre. Where reservations of public lands have been made which it is deemed advisable to restore to the public domain, I would always offer them at public competitive sales, in all cases reserving the right to a man to settle there if he chose the land as a homestead. I would not make any distinction in the price between the different kinds of timber, but would simply put it up at public auction, and if there was any difference the public would find it out and the government would reap the benefit; and the best evidence in the world that it was not worth more than a private entry would be that no one would purchase it. I would only limit the quantity of land a man should have when I gave him special privileges, as under the homestead and pre-emption laws, and in all other cases I would take the limit off.

As regards timber, I believe it is the true policy for the government to get its timber lands into the hands of private individuals, and that in such hands the timber could be better protected than it is now. The fact that speculators buy lands and hold them does not make such lands more valuable; on the contrary, it reduces the price. That is the experience of almost every one. Those who bought wild lands in this State have and will sell for less than they paid. There is sometimes an extraordinary inducement to get hold of wild lands near or along railroads, and I would in those cases offer the lands at public auction and let every man have a chance, without any limitation as to the quantity he could buy.

Q. As a matter of history, has not the experience of this part of the country and of other countries demonstrated that when all the timber lands passed into private proprietorship the timber simply was stripped off the land and the country became treeless?—A. I see no inducement for a man to strip the timber land, any more than there would be for him to make his agricultural land worthless. A man would maintain his own timber lands more carefully than he would those of the public. At present the value of the lands may be vested in its timber, but when we have the population on this coast that we have elsewhere the land will be valuable for more than the timber. There is probably as large an amount of timber growing to-day in California upon the

lands which have been stripped as there was upon them formerly, and the lands which have thus been denuded will in fifty years be covered with a respectable growth of timber, much thicker on the ground than before. And I believe that here now, in the foot-hills, there is as much timber growing as has been cut off. The best, cheapest, and safest manner of protecting timber in this State is to reduce it to private ownership. In my judgment the timber of the foot-hills will reproduce itself in one hundred years as regards quantity, though the trees would not be so large as at present. If the government sold off all its timber lands to parties who should market it, I do not think the water supply would be affected one way or the other. Our rivers are fed by rain and snow fall, principally from snow, and if the timber was cut off I do not think it would materially affect these streams. I think too much credit is given to forests as regards their power to produce rainfall. This coast depends upon certain currents of air for its rain and snow fall, and therefore I do not think the absence of trees would affect us materially. But suppose they did, my answer is that the forests would be better protected under private ownership than they could be under governmental supervision. They will be preserved longer and more completely.

The mineral lands in this State are mainly distributed through the timber belt, but they are not, as a rule, located in thickly-timbered sections.

Under my proposition for the disposal of timber lands by private land entry I would not propose the reservation of such mineral lands as are contained within the timber districts. I do not see what difference it makes to the government how a man gets the title to a mine; whether he pays the government $4 or $20 for it. If a mine is worth developing, the man who buys it is as much entitled to the property as the discoverer. The country is equally benefited by the wealth taken from it. It is a pretty difficult thing to determine just when a piece of land is worth more for mining than it is for agricultural uses or timber, and in disposing of doubtful land I think it will be better to reserve the right to lodes, quartz veins, &c., contained in it. Sometimes the question whether land contains mineral or is only agricultural depends upon how a fellow wants to prove it. I think perhaps it would be well to leave it, in doubtful cases, free to the prospector for mineral. When a man was actually developing a piece of land under the mineral laws, he should be allowed to go on; but it is a bad thing for a man to have a piece of land under control and not know whether he wants it or not; and there should be some limit as to the time he should hold it.

As regards the origin and destructiveness of forest fires, my opinion is that under private ownership they would be better cared for than under the government. Fires are started by men generally through carelessness, and I know of no way to control them. But parties owning the lands would be directly interested in putting them out.

As regards the ascertainment of corners of public lands in this section, it was originally a very difficult thing. They are now pretty well established. They are established by the county surveyors. The government only sectionized the highlands and left the swamp lands out, and they were surveyed by the State surveyors.

It is my opinion that the government should reserve the right of easement on every section of land of at least 33 feet each way for a public highway, and that such reservation should be made when the title passes to the individual. It has been a source of more annoyance and expense to settled countries to obtain the right of way for roads than it would have been to have bought all the farms across which the roads ran. In this and the other States the government could reserve 66 feet on each section line for public highways, and I would recommend that be done in all future sales; and it should then be left to the States to determine whether or not such right of way should be made available. In Sutter County the State paid more for right of way than the owners of the farm paid for the land originally.

There is one qualification I want to make to the above statement. I am not in favor of granting large sections of country to any individual or corporation, and when I suggest taking the restriction off as regards the amount of land a person may purchase, I do not think it is good policy to grant whole sections of country together; but when put up for competition and right of entry I would take the limit off.

As regards the idea embodied in the so-called Plumb bill, I do not like the idea of selling a section of timber to a man with restrictions as to what kind of trees he shall or shall not cut. The very best guarantee that timber will be taken care of is found in the fact that a man owning it will consult his best interests, which will generally coincide with the country he lives in. If he wants to use a piece of land for timber purposes, he will take care of it; and if he wants it for agricultural purposes, he will do likewise. My opinion is against that proposition.

Testimony of Charles M. Patterson, register, and L. T. Crane, receiver, Marysville, Cal.

To the honorable the Public Land Commission, San Francisco, Cal.:

GENTLEMEN: Referring to your circular, we have to say that we occupy the positions of register and receiver of the land office at Marysville, Cal. Have held said positions for more than four years last past. We have each lived in Yuba County, California, since 1852; have neither of us ever acquired or sought to acquire title to public lands except in one instance each, and that for mineral lands.

The expense of acquiring title to the public lands in uncontested cases, so far as our experience goes, is but little beyond the legal fees and commissions. In some instances a fee is paid to attorneys to hasten the issuance of a patent; and some parties, incompetent to make papers, pay small fees for having it done.

Some changes in the practice under the present laws, we think, might be made in the interest of claimants and not detrimental to the government. For instance, in filing either homestead or pre-emption claims, if parties were required to first clear the record there would be more security and less litigation. In some cases we think pre-emption claims are filed over others through malice and for the purpose of hindering and annoying *bona-fide* claimants. When two or more have claims to the same land, neither is disposed to make the improvements they would if they knew their claims were valid.

Under the present practice a person abandons his homestead claim before it is restored to the public domain, his abandonment must be transmitted to the Commissioner, and his order of cancellation returned to the local office. We can see no reason why, when the claimant files his written and acknowledged relinquishment, that fact should not be sufficient to authorize its cancellation and the restoration of the land. Evil practices have grown out of the present rule, such as the employment of attorneys in Washington to telegraph the date of the mailing of the honorable Commissioner's letter of cancellation, thereby preventing the party, who perhaps may have bought improvements, from obtaining the land.

The rule that holds in regard to homesteads of deceased claimants we think might be changed. In cases where the parties have died intestate, leaving no heirs and no estate other than their claim, which is not of sufficient value in many cases to justify an administration, but would be taken if clear, it would seem that if complaint is made for abandonment the publication of the citation ought to be sufficient notice to any one having an interest in the matter. In such cases the homestead remains valid the full seven years under the present rule.

There is a question whether the order withdrawing the large body of lands because of mineral was a judicious act. Even if it was then the best, now that mining has become a secondary interest in this State, would it not be in the interest of the people to reverse the position, and place the mineral claimant on the affirmative? Along the foot-hills are many tracts well adapted to the growth of fruit, and particularly vineyards. The cost and trouble of disproving the mineral character restrains persons from settling upon these lands, and they remain vacant, used generally for herding sheep and cattle upon. In some cases those who occupy these lands in that manner keep settlers off by representing that they contain minerals.

In this connection we will say that 160 acres of foot-hill land is not enough to justify settlers in attempting to support a family upon. But few acres probably of the 160 would be adapted to orchard or vineyard, and the remainder would not be sufficient for grazing purposes. Feed for stock is produced on those lands but a few months in the year, and then in a limited amount. Three hundred and twenty acres is as small an amount of land of that class as we think claimants should be limited to.

Really the best way to dispose of the public lands would be as soon as surveyed to offer them at public auction, and thereafter allow them to be sold at private entry. Past experience in this State indicates that the evil of large holdings will cure itself. Now that the new constitution has been adopted and lands are to be taxed for their full value, no large bodies will be retained by speculators. If the timber lands were thus disposed of, the forests would be more likely to be guarded against fire and waste. The act for the sale of timber lands has been in force since June, 1878, and yet, although there is a large amount of fine timber land in this district, not to exceed half a dozen entries have been made under it. True, the lumber business has been at a standstill during that time, but, in our judgment, that is not the only reason so few have availed themselves of the provisions of that act. The quantity is too small. The only way to acquire a sufficient quantity to justify the erection of mills is to evade the law and procure others to make sworn statements to what is not true—that they are acquiring the lands for their own use.

In regard to changing the manner of making surveys, we are satisfied that if the proposed method had been first adopted it would have been much more accurate and better every way, but doubt the advisability of changing from the rectangular system.

Our experience leads us to think that the same rule should hold in mineral that does in agricultural lands—the adverse claims should be disposed of by the Department.

CHAS. M. PATTERSON, *Register.*
L. T. CRANE, *Receiver.*

MARYSVILLE, CAL., *October* 6, 1879.

Testimony of Dana Perkins, Placer County, California.

SAN FRANCISCO, *October* 10.

DANA PERKINS, of Rockland, Placer County, California, testifies as follows:

I have for some time been in the employ of the Central Pacific Railroad Company, disproving the alleged mineral character of lands within its limits, declared to be such by the deputy surveyors whose reports went up to the Commissioner of the General Land Office and then to the Secretary of the Interior, at whose order they were withdrawn from settlement because of the mineral alleged to be contained in them. I have proved 40,000 acres of those lands that were shown to be mineral upon the maps to be non-mineral. The railroad takes all the odd sections, and when they find any mine on those sections they leave them as mineral land, and do not question its character; but when we do not find existing mines upon the section, that proves its non-mineral character. We have never failed in any instance where we have undertaken to show the non-mineral character of the land. I do not think there are mines on one acre in five thousand of what is now called mineral land.

Question. How would you correct this designation of mineral land when there is no mineral upon it?—Answer. I do not think it can be done in any different manner from what it is done now, but the Secretary has declared it to be mineral in some places where the deputy surveyors had declared it to be agricultural land. The whole foothills country, for eighty miles in length, ought to be declared agricultural land. If that land was open to settlement it would sustain a great many thousand farmers, and they would be promptly occupied if this ban was taken off of these lands, and they would then be settled up. They are worth more for agricultural purposes than they are for mineral. They are not being mined at all, and they will never again be worked as mineral lands. It has all been worked out. It takes but a short time to work out surface claims, and these lands, having been worked out, have now been laying idle for thirty years. I think these lands ought to be declared agricultural instead of mineral, and let the proof fall upon the miner. I think that when a man makes a settlement upon that land he should get title to it. I think if a mine is alleged to exist on land the miner should prove its existence, and that otherwise the land should be classed as agricultural. I think there should be a limitation of the time within which he should pay for his mine. Give him one mine and let him pay for it. Throughout the mineral belt there are many men who have sheep and cattle, and they try to keep the land under its mineral designation, so that they can continue using without paying for it, and get the use of it for nothing. By an agreement between themselves the stock men divide up the land into several tracts for their own use. They are not taxed and the country derives no revenue from them.

There is also trouble with these shake-makers. They will cut down a sugar-pine that will make ten or fifteen thousand feet of lumber and take out one or two of the best cuts from it, and then leave it. These timber lands should be sold. I would divide it up into sections and grade the price. The railroad company sell their lands for five, seven and a half, and ten dollars per acre, and the government could obtain as much as the company. The railroad companies sell their other lands for $2.50 per acre. If the government parted with its title to the timber lands, they would be cared for. If there was no law passed for their sale I should put them under the control of the district land offices. They are not protected now, and are being divested of their timber by shake-makers, fires, teamsters, &c. There is annually a great destruction of timber, and if it goes on much longer the timber land will be greatly injured. The timber here reproduces itself—the same kind of timber. There is a great deal of fallen timber all through the forests, which I would give to the settlers. This would benefit the timber by taking out this combustible material. I do not think any person should be allowed to cut timber, except for his own use. In regard to saw-mill men, I would sell them tracts of land for saw-mill purposes—all they wanted. I would sell the timber and land together and give the mill men the title to the land. I would sell them the mining interest too. I would not reserve subterranean rights. The government is issuing patents now in this mineral belt and it reserves the mineral rights. I think there should be an absolute law that when a man purchases the land he shall be enti-

tled to all there is on or in it. I would sell a man all the pasturage land he wanted at a graded price. It can all be irrigated. I would sell it for $2.50 per acre. Men are all the time coming to me to buy land at that price. There is no offered government land. They don't buy it now, because they can't buy it. As fast as the railroad companies can disprove the mineral character of its lands they are being sold.

Q. In Colorado and California, where large portions of land have been set aside as mineral by the Secretary of the Interior, it costs a person about $28 to prove the non-mineral character of that land. You think the remedy for that is to make the miner prove that it is mineral?—A. Yes; it is the same in California as it is in Colorado. A man has to prove the non-mineral character of the land here, at a very great expense, and if there was a contest or some other man wanted to be bought off it would cost a good deal more. It is very burdensome and onerous on the settler to prove the non-mineral character of the land. It would give five thousand farms in the foot-hills if these lands were released, and that too of the very best grape-growing country in the world. Any of the foot-hills will bear grapes and fruit, and all that land is more valuable for agriculture than for mineral. I think it should be declared agricultural and opened up for settlement. This one withdrawal is keeping a million of acres of land merely at the disposal of men who desire to prospect on it, to the detriment of the country and of the State which it keeps from being settled up.

Q. How can it be better done?—A. I do not know of any better way, but I should give the miners one year to make final proof on their lands, and then let all that is not paid for be declared agricultural land. As I said before, the placer claims are worked out here, and there is hardly any person now engaged in placer mining. The placer miners do not hold their claims by filing in the United States Land Office; they hold them by local regulations. The method of taking a placer claim is by several men staking out a district and each one taking his claim. There is not one man now working in the rivers where there used to be thousands, but that land is still held as mineral, thus preventing it from being settled up. It was the best part of the State for fruit. It will raise the most beautiful oranges.

Q. If that land need irrigation, as I presume it does, could you reclaim it through irrigation by saving the water in reservoirs along the foot-hills?—A. No, it has to be brought in ditches from the rivers; there is ample water there to irrigate with if it is used. The source is from the snows and runs that feed the streams, and if the water is taken out by the ditches irrigation can be made practicable over a very large area. I do not think there should be a national system of irrigation, though I really should not speak positively about that. There is a great deal of water still needed for irrigation purposes. The mining ditches are now selling the water for irrigation, which is required on all the foot-hills up to the timber belt. They raise three crops of clover and alfalfa a season by irrigating. All these side-hills raise alfalfa. They cut two or three crops a year by irrigating. I know of many cases where three crops have been cut in a year.

Q. Would you give a man a sufficient amount of land for a pasturage homestead?—A. I think it would be a good idea. It is a good idea to let a man have plenty of land. Men want to fence their land, but they will not fence it unless they have a sufficient quantity. During four months of the year this land will graze cattle, and then they drive their stock up in the timber lands during summer, bringing their herds back in the winter. They like to have a sufficient quantity of irrigable land to raise grass. If the men owned this land they could only make it possible to live there the whole year round by irrigation. If the timber land is sold the stock men will buy it for small ranches, and would protect it and keep the proper trees for the mill men; and if the mill men bought it they would sell the land to the stock men after cutting the timber. Under the present system they can't buy it, but if they had a chance to purchase it at not more than $1.25 per acre they would do it. I'm speaking now about California. I do not know anything of Nevada. All the sheep and cattle men in the State are buying the land wherever they can. I think it would take, on an average, ten acres to sustain a beef here, taking the winter and summer ranges together. If the title to these lands could be obtained there would be no conflicts between the cattle and sheep men. Cattle men leave where sheep have been.

I think these questions ought to be settled as soon as possible. These lands are held in severalty by a system of usage. If nothing else is done, they had better be held by common consent, but I think it would be better for the government to sell these lands. I would not compel the settler to leave. It would be better to charge a man something more, and not compel him to lie to get the land. I have lived here for twenty-nine years, and we are proving the non-mineral character of these reserved lands at the rate of 20,000 acres per month.

Testimony of B. B. Redding, at San Francisco, Cal.

B. B. REDDING testified, at San Francisco, Cal., October 6, 1879, as follows:

I have lived in this State twenty-nine years. I have traveled from one end of it to the other, have lived in several portions, and am pretty well acquainted with the entire country. There are three sections of this State which are differently affected by the climatic laws. All of the lands west from the summit of the coast range and nearly to Point Conception are influenced by the fogs made by the Japanese Gulf Stream, which flows down this coast in a stream 200 miles wide. That water is colder than the surrounding ocean, and the wind blowing eastward across this cold current is cooled and gives rise to fogs. The moisture from this gulf stream falls on the coast range of mountains, giving them these nightly fogs. They are probably equal to three or four inches of water. This is shown by the crops.

Question. In what portion of the State is agriculture possible and profitable without irrigation?—Answer. It is profitable in the whole State of California wherever possible. Agriculture is possible without irrigation in the average number of years in the Sacramento Valley north of Stockton and west of the summit of the coast range of mountains, south of Stockton and as far south as Point Conception and Santa Barbara, and everywhere in the Sierra Nevada Mountains south of Stockton at an elevation of 2,000 feet; for it has been found by observation that the increase of rainfall on the western flanks of the Sierra Nevada is actually one inch over that part of the valley for each 100 feet increase in altitude. Except in very exceptional years agriculture without irrigation has not been practical in the San Joaquin, Tulare, and Kern Valleys below the elevation of 2,000 feet. So far as relates to climate and rainfall, there are valuable lands in the northern part of the State in the valleys which can be readily cultivated, having sufficient rainfall annually. South of the line drawn through the center of the State in the valleys crops can only be raised by artificial irrigation. There are extensive tracts of land of good quality, so far as relate to constituents that go to form the soil, which would be valuable if water could be put upon them. Then there are on the foot-hills above this, lands valuable only for grass and for some oaks that grow upon them. Above these, again, higher up, are lands in the southern part of the State principally growing the yellow pine, which possibly could be cultivated, but which now have no value except for their timber. Then there are also vast tracts of land entirely desert, and made so by the fact that sufficient rain does not fall to produce vegetation.

Q. I should like to have your opinion in regard to the change in the rainfall, *i. e.*, is it decreasing?—A. I have no authority to base it on, but I know it is Professor Whitney's and Lieutenant Wheeler's opinion, and that it is the opinion of the surveyors who surveyed the different routes of the Pacific Railroad, that the rainfall in the lower part of this State was at one time very much more than it is now. The watercourses all show that at some former age of the world it was very much more, and that it has for some occult reason gradually lessened; this is also true in the lower portion of the State, and upon these and similar circumstances I base my opinion. The rain-gauge records have not been kept long enough to obtain any definite results based upon rain-gauge records. It is my opinion that it is lessening, but I cannot give you any authoritative statement for it. This is certainly true on this side of the Sierra Nevada Mountains. When the trees are cut down they immediately reappear, not, as in the Eastern States, in other kinds of trees, but the same kinds come up thickly in abundance and grow abundantly and rapidly.

In Grass Valley trees that were cut down in 1853 have grown up again and are about one foot in diameter. It would take fifty or sixty years to reproduce them of the same size as those originally felled. Whenever on the western slope of the Sierra Nevada timber has been destroyed it is immediately reproduced of the same species, while on the eastern slope of the Sierra Nevadas wherever trees are cut down no others come in their place, or very rarely. There are exceptional places where there is a gap through the mountains through which moist air comes, and in such gaps a few of the same species of tree will be reproduced, showing, I think, that the condition of things as regards the climate when these trees originated was not the same as it is now. In other words, when these trees originated on the eastern slope of the Sierra Nevadas there was more moisture than there is now, and it is one of the things that confirms me in the opinion that in the southern portion of the State the rainfall is lessening. When you get north of Stockton the trees have not been cut down; so you cannot tell, and besides there is plenty of rain there where the timber has been cut off.

On the eastern slope of the Sierra, where is situated the Comstock mine, you very rarely see a second growth, while on the western side of the mountains they come up so thick that a rabbit can hardly get through. The moisture comes in from the Pacific Ocean, strikes on the western side of the Sierra Nevadas, and here the trees are reproduced, but on the eastern side, where the clouds descend toward the desert after having been robbed of their moisture, the trees do not grow.

Q. I want to ask you about the destruction of timber south of the altitude where there has been abundant rainfall, say south of Stockton and south of the railroad.—A. The destruction is very large in the mountains near Bodie. The destruction by fire, principally, is enormous. I cannot tell what the proportion would be between the destruction by fire and the destruction by man. But the fires every autumn are immense. There is more destruction by fire than by man.

Q. What, in your judgment, is the origin of these forest fires?—A. Hunters, campers, sheep herders, and other persons traveling through the mountains set the fires; and then, too, it is very dry in autumn in our mountains, and I have no doubt a great many fires are started by the friction of trees swaying in the winds and by lightning. I saw a fire the other day, up near the summit, where it seemed to me almost impossible for any one to get without ropes. That fire must have taken place naturally. I do not think the Indians generally set fire to timber.

Q. How would you preserve the timber?—A. Let somebody own it; get the timber into private ownership, so that there will be somebody to watch and preserve the forests.

Q. Will you suggest a law to accomplish that result?—A. Under the present law you can get 160 acres, but I should say seven-eighths of the Sierra Nevada is not yet surveyed.

Q. Is not the execution of the timber laws under the present condition of affairs practically inoperative?—A. For the want of surveys it is; and then we have not a demand for it yet. There is not population enough to demand it. The timber land is only valuable for timber purposes and grazing and agricultural purposes. This land is of small and exceptional value for agricultural purposes, and of slight value for pasturage purposes. Its chief value is for timber. If this land is to go into the hands of private individuals it will go into their hands because they want it for timber enterprises, and some exceptional cases for grazing purposes.

Q. Is it practicable, in general, for farmers to own their own timber?—A. The valuable timber lands on the mountains are at such an altitude above the valley where the cultivation of cereals is carried on that for a direct use they are unavailable to farmers. They are only available to the farmer through the railroads or by long transportation by team. Some of the valleys near the water-courses produce some scattering oaks, which are valuable for fire-wood only to the person who owns the land. The timber lands of the State of California that are valuable for building and manufacturing purposes are at an elevation of from 3,000 to 6,000 feet above the valleys, and are not available for the use of farmers, because of their immense distance from the lands in the valleys. That is, they can be utilized only by the construction of railroads or flumes, or by long transportation by wagon. Persons who go into the enterprise of cutting timber for this market in the Sierra Nevadas ordinarily are required to invest a great deal of money in steam saw-mills. In some cases they have to construct short railroads and in others flumes for the transportation of their timber from long distances to the mills, and from them to the nearest available point for transshipment. The consequence is that it requires a long investment, and the saw-mill man is required to own a large tract of timber land to make his business profitable and to warrant an investment of capital necessary to carry on the business.

Q. How do these saw-mills now get their timber lands?—A. Each person connected with the saw-mill takes up a tract of 160 acres by filing declaratory statements in the land office. They get their employés, each one, to take up 160 acres more. By the time that is cut off they move the mill to some new point and employ a new set of hands to get some other tracts of 160 acres.

Q. If a man owns a saw-mill, as they do in the Sierra Nevadas, would it not be just as profitable to buy the logs of the small owners as it would to own the timber lands?—A. I cannot answer. The persons around the mill file on the land, and in the course of two or three years the small men sell out to the saw-mill owner.

Q. Is not this general habit of appropriating the timber land due largely to the want of facility in acquiring title?—A. Yes, sir. There has not been, until within a few years, any right recognized in any person as to the ownership of timber lands on the Sierra Nevada Mountains. The reason has been that the law compelled a man who wanted a title to the timber to take a false oath; he had to swear that he wanted it for agricultural purposes.

Q. Is there any law now in existence by which a party can honestly obtain title to the timber lands in sufficient quantities to be of value?—A. There is not. A man can get 160 acres under the act passed two years ago, but frequently that is not enough. The land laws so tie up and hedge about the timber lands, and require oaths which must conform to the oath in the pre-emption of farming lands, that they are practically inoperative, and they render it impossible for the saw-mill owner to obtain title to an amount of land sufficient to warrant him in investing his capital in the location of a mill and going into the lumber business.

Q. In your judgment, would or would it not be wise to provide convenient facilities for acquiring title to the timber land in the present generation, and take some steps

for the preservation of timber for future generations?—A. I should put them in the market and take chances that private ownership would care for them. Where they have had no ownership I note that on the western side of the Sierra Nevada Mountains the timber renews itself. I suppose it would do the same by planting on the eastern side of the mountains, and wherever the land gets into private ownership it becomes taxable. A man has something he can mortgage, something that he can raise money on, and he immediately feels a personal interest in it, for himself and for his heirs hereafter, and so he protects it and does the best he can with it; but where it is left in the present condition the idea is to clear from it everything you can. I would reduce everything in the shape of public lands to private ownership in small tracts, so that it may all be held by private ownership. While in its present condition, it is excluded from taxation.

Q. Are you familiar with the results of the indiscriminate sale to private parties in other countries—say in the European, for instance?—A. I am familiar with the land about the Mediterranean Sea. It was once a much more heavily wooded country, but it has ceased to be wooded now. In Italy they are rewooding the country by planting olives, walnut, orange and various other trees, and are, owing to the increase of population, increasing the supply of food by replanting in Italy those trees that are of value to man. In France the cultivation of timber is kept up. You see there a strip three-fourths of a mile long with one kind of trees on it, and other strips with other kinds of trees on them. There is an immense deal of wood in France. Germany is very well wooded. No man has a right there to cut a tree, unless he brings the proof that he has planted two in its place. The effect of this is, that every farmer has to protect his trees. These laws have not been in operation very long, but long enough to have largely increased the growth of timber.

Q. Would or would it not be advisable for this government to make some provision for the future in the matter of the timber land? Why wait until the timber is all destroyed and then try to reproduce it?—A. That would be the most profitable thing this State or the government could do to-day. Here we have a tree which existed in a former age of the world, and exists nowhere except upon this coast—nowhere except in the midst of fogs. This is the one place it exists upon earth. That is our redwood. It grows within the influence of the fogs; it grows only where the fogs will reach it. It extends to the northern portion of the State, just to the edge of Oregon, and south to the bay of Monterey. It would pay the State to-day to spend a million of dollars in procuring the seeds of this tree and planting them, and preserving this kind of tree. Our climatic conditions are so different that we have not one tree identical with the Eastern trees. The nearest is the little juniper that grows on the snowy crest of the Sierra Nevadas.

Q. As I understand you, the timber lands are of very little value except for the timber?—A. Timber is practically their only value.

Q. And this timber is cut wherever there happens to be a market for it?—A. Only where there is a market, unless mines spring up in the country, and then the timber land is denuded. It might be wise for the government to pass such a law as would furnish the present generation with all necessary facilities for obtaining its timber, and at the same time making a reservation for the future. It is a question whether that could be accomplished by reserving the fee to the land on which the timber grows. The main point is to make the people pay the taxes on it. Now they skim the timber off it and let it go. They should be made to buy the land. I would get the land out of the hands of the government and into private ownership. That land has no value except for timber purposes.

Q. Don't you on your railroad lands see that your timber is protected or taken care of?—A. No, sir; we sell the land as rapidly as possible and let the owner take care of it. The railroad company has all kinds of propositions to strip the timber and let the railroad keep the land and pay taxes on it. It would not do for the government to sell the timber in alternate blocks. They would steal the timber on the government blocks and hold on to their own. Sell it, get rid of it, turn it into money, and let the owner manage his own interest. I suppose the result of carrying out such a proposition as mine would be this: suppose the government would allow a mill company to buy, say at five dollars per acre for cash, at private entry, all the land on one slope of the mountains where the timber could be got. That particular saw-mill company, to use that timber land, invests fifty or seventy-five thousand dollars in a timber and saw-mill enterprise; then the company could go there with its saw-mill. It would know just exactly what timber it had to cut, and how long it would take to cut it; but no man can afford to make his investment without holding that amount of land. His personal interests would induce him to preserve that timber from fires and from neighboring saw-mills. He will have gone into the business with his eyes open. He knows what his horses and oxen cost, and he knows his market facilities, and it has been a straight, honest transaction between him and the government, and when he has taken out the timber for three, four, five, six, or eight years he will know that that is the end of his investment. Then that tract of land he will sell to sheep and

to cattle men, and it will still be in private onwnership and used for grazing. That seems to me a sensible, practicable way of disposing of the timber question.

Q. As a matter of fact, do not the large mill owners own their mills now; take, for instance, Tahoe County?—A. I think they do. That company is composed of wealthy men, and had the monopoly of supplying all these mines. They deemed it advisable to obtain title to the land because they had a monopoly of supplying the timber for these mines and knew of a certainty what they would need; hence they acquired title to those lands.

Q. Does the fact of their owning that large body of land have any restriction upon their cutting the timber upon the government land?—A. I do not know.

Q. Is not the timber in their district denuded?—A. Yes, in their immediate vicinity.

Q. Would the fact of the private ownership of timber lands prevent the public lands from being stripped of the timber?—A. The railroad takes care that its timber is not stripped. It owns it, and goes for a man who takes that timber. They are enabled to protect their timber, and they protect it for the same reason that one would protect his pocket.

Q. If a corporation can protect the timber because they have much wealth and means can a private individual do that?—A. Yes sir. If I had a tract large enough I would protect it. I would not buy six hundred and forty acres unless I had a saw-mill or expected very immediately to sell it. I have bought some timber lands and obtained title to them, and am holding them, and have a man to see that there is no destruction until I get ready to sell them. Individuals buy timber lands for saw-mill purposes. There is none bought for speculative purposes.

Q. Would not the placing of these lands in such possession promoting private ownership practically operate as simply establishing a nucleus from which they could operate upon the adjoining timber land belonging to the government?—A. No, sir; I think not. I do not think a man would invest fifty or seventy-five thousand dollars in a saw-mill without a certainty of really holding the timber, and if all the timber land in the vicinity of that saw-mill had not been already purchased from the government they would take very good care to purchase it, for if they did not the neighbors would enter it and make them pay for it. There is no speculation of the timber land in California. There has never been; it is not practicable that there should be. There is no danger of a monopoly of the timber land; even if there was, they are not yet open to private entry. The timber lands of California extend for 500 miles along the flanks of the Sierra and Coast Range Mountains and are at least 40 miles wide; and there is not money enough to spare in California, even if they were taken at private entry, to pay taxes. My idea is that they should be taken at private entry.

Q. Assuming that these lands should be sold at private entry, what price would you pay for them.—A. The railroad has ascertained that timber lands in the Sierra Nevada Mountains are worth from $4 to $10 per acre, dependent upon the thickness of growth of the trees and facility of transportation of lumber, &c., and the average would be from $4 to $10 per acre. If the government would sell these lands for $3 or $4 per acre they would not be taken upon speculation but by men who propose to make money from putting the timber into lumber.

Q. Do you think there should be a difference in price for the different kinds of timber?—A. No; the price should not be fixed upon the kind of timber but upon its thickness. We have no hard woods in the Sierra Nevadas. Hard wood grows here, but it is not available for manufacturing purposes. The six months of dry and six months of wet weather make our hard-wood timber so brash that it is not available for manufacturing purposes; though most hard woods do not grow high up on the Sierra Nevadas, they grow in the foot-hills. We have no hard wood of any sort, except a few oaks, above the elevation of three thousand feet. Above that elevation are the forests of pine, spruce, and fir.

Q. Would you sell the ordinary Sierra Nevada pine for the same price as the ordinary nut pine?—A. The nut pine grows where oaks grow.

Q. Would you sell those two trees at the same price?—A. If it could be properly done when the lands are surveyed—if the surveyor was an intelligent man he should be made to grade them for the quantity and quality of the timber upon them. These township plats would then be the guide for the land office in selling the timber at different rates. You would require an honest man for that work, and should pay him more money than he is paid now. You cannot do good work for the money now paid.

Q. Can you suggest any system by which the lands can be sold unsurveyed?—A. No, sir.

Q. Yet without selling them unsurveyed would this system of private entry amount to anything?—A. I don't see how it could be done. You might let the district land offices appoint men to sell the timber for the stumpage, but let it be surveyed. It can be surveyed as rapidly as required.

Q. Would it not be necessary in order to protect that timber to go a step further, and simply sell those lands which are surveyed and provide some mode by which unsurveyed lands can be obtained; for instance, in a newly discovered mining district?—

A. It should be the duty of the surveyor-general, when a new mining district is opened, to run lines connecting it with some survey, and then survey it that the miners may attain title to the timber land in the vicinity of the mines.

Q. Would it not be wise to prepare a system by which you would have to wait until the survey is made to dispose of the timber?—A. I don't think you can do that unless some man is appointed to collect the stumpage. I would provide means so that when a mining district is started the land can be surveyed. I would have Congress make an appropriation for a fund out of which the surveyor-general could pay for surveys made out of the ordinary course of surveys, progressing as the demands of the settlers require. Then, when in the new mining districts a new settlement is made, this fund could be applied directly to the survey and settlers would thus be enabled to obtain their title sooner.

Q. Will the lands that need to be surveyed be surveyed?—A. I think that would be attended to properly.

Q. Would you have the surveys made only to the extent required by the public necessity, then?—A. Let me say that the law has always been made applicable to agricultural settlements, and it has grown into a rut of that kind.

Q. Under that law does it not result that the lands which are really necessary for the public—people have to come forward and deposit money to have them surveyed?—A. In some cases that is true, in some it is not; the money paid should be returned after they have obtained their title.

Q. Is there any difficulty under the present law in selling mineral land unsurveyed?—A. Oh, yes; no unsurveyed mineral lands are sold or patented.

Q. Cannot that same thing obtain with timber land?—A. Yes, sir; the method employed for the mineral lands is this: Here is a piece of mineral land in the Sierra Nevada Mountains, and there are no surveys within 40 miles. I have a mineral claim and I want it surveyed. I apply here to the surveyor-general and make a deposit in the sub-treasury, and the first thing is to run a line, a known survey, measuring the distance accurately to this point, and then from that any kind of survey can be made. For the timber land I would run the township line and subdivide it regularly.

Q. Why not survey that claim as you would a mineral claim? Why not locate that point by triangulation, and then survey and subdivide according to the rectangular system?—A. That would do.

Q. What would you do when you got along with the rectangular survey?—A. I would connect it and make it a part of the public survey, but I certainly would reduce the lands to private ownership as soon as possible; give people the opportunity to buy the land and they will take care of it and preserve it. The movement must come from somebody authorized by the government. It will not come from the people; they want the timber without paying for it. It must come from the surveyor-general or somebody else whose business it is to see that these lands are surveyed. There is no difficulty about this, for the surveys are extended in the vicinity, and they can find the corners or township lines somewhere without very much difficulty; practically there would not be much difficulty. The deputy surveyors are not sufficiently well paid, and they cannot afford under present prices to do the work as it should be done. There were some surveys in this country that when they were joined were very much out of the way. It is all settled now because they have connected them, and, of course, in surveying nothing is an error that is known to be an error if you know how much the error is.

Q. I understand that your idea for protecting the timber lands would be private entry without restriction in the Sierra Nevadas?—A. Yes.

Q. Do you make any distinction in other places?—A. Yes; that law would not apply in other States.

Q. Why not in the Eastern States?—A. If I could enter at private entry chestnut and black walnut in the Eastern States, I would consider it a very valuable investment to keep for my children. In the Sierra Nevadas it takes so much capital to locate a saw-mill and obtain means of transportation to the market that there would be no danger of monopolists, and the timber lands, if they were thrown open to private entry, would not be seized upon by monopolists. That is my idea.

Q. What effect would this unlimited sale of timber land have upon the development of the mineral portions of the country?—A. It would not have any effect.

Q. Are not the mining camps generally among the timber?—A. No, sir; very exceptionally.

Q. How is it with Virginia City?—A. Virginia City is not in a timber locality.

Q. How far is it from the timber?—A. Fifteen or twenty miles.

Q. How is it at Bodie?—A. I think Bodie is from 15 to 20 miles from the timber. Let me state here so that you can have a fair understanding about that. At one time in the history of the world there was a series of rivers running almost parallel to the rivers that now flow from the Sierra Nevadas. At that time these ravines that we see were not cut out. Probably glacial action wore off those stones and carried them down. The glaciers cut out these ravines, and the gold that was in the quartz among

these rocks was deposited in the ancient rivers that made these ancient river beds. Afterward when the volcanoes, when the whole Sierra Nevadas were almost a volcano, the basalt or lava was thrown up, and occupies the summits of the mountains, and the river-beds were covered up. Then after that came the present condition or age of the world, when I think there was more rain and snow on the Sierra Nevadas than there is now, when these present ravines and cañons were cut out, leaving our present rivers. Wherever they cut across or came in contact with these ancient rivers, of course they cut them out, and the gravel and sand was washed into the present beds. Thus were formed the benches and bars of our lower streams, and wherever they were not cut out they made what is called placers. Thus our hydraulic mines are a long distance below the summit of the Sierra Nevadas. There are no mines at the summit of the Sierra Nevadas, except at Meadow Lake, where there are some rebellious ores for the presence of which no explanation has been found, that is so far as I know, except perhaps the Reese mine up above Downeyville, and which is the only mine I know of at the summit. At other points where the granite crops out at the summit of the Sierra Nevadas there appears to be no ore. The mines are all below. The placer mines were made by these rivers cutting through the ancient river channels and washing them down and depositing their sands and gravels to make the benches and bars of the present streams. Up to the summit of the Sierra Nevadas, where the timber commences, there are practically no mines and never have been. That will explain away the danger you spoke of.

I might add that the Reese mine is very rich. This group of mines at Meadow Lake are at the summit of the Sierra Nevadas, but I know of no others on the summit. There would be really no practical interference, except in rare cases, in the sale of the real timber lands of the Sierra Nevadas without the mining interest—that is, in that immediate neighborhood. It is settled for mines lower down.

Q. Would it be any harm to insert in a grant for timber land a clause reserving the mineral rights?—A. No; I think not.

Q. Would it be an advantage?—A. I think it would be an advantage, except that it encumbers a man's title, which is a disadvantage. I think, on the whole, that action would make an immense deal of litigation in this State. It throws titles into confusion. Wherever you give a man anything but a clean absolute title you injure him; you embarrass him; you trouble him to sell the land, and you leave him uneasy, because he is subjected to every wandering devil who wants to dig into his ground and see if something is not there. But here is a clause that any ditch company can come in and put a ditch upon that land. That is wrong. That is all wrong. Those mineral clauses have prevented the settlement of thousands of people in our foot-hills who would have come in and planted orchards and vineyards.

Q. Would it be a disadvantage to divorce the timber and mineral interests and subterranean rights?—A. Inasmuch as the only object of persons who would enter timber in the timber lands of the Sierra Nevadas at private entry would be to use them for saw-mills, such people would have little interest in the land after the timber had been removed; therefore to make a clause in his patent which would reserve any minerals, if any such should be found therein, would not be a serious disadvantage to him.

Q. Would such a clause as that be advantageous in permitting prospecting and discovery?—A. I hardly think it would. Minerals have only been found in exceptional cases among the timber lands of the Sierra Nevadas. The discoveries made would not be made in such lands, except in rare instances. Very few mines have been found among the real timber lands of the Sierra Nevadas. Practically the timber line is as low as 2,000 feet in the Sierra Nevadas. The timber line in Shasta will come down lower. We find the same timber growing at lower elevation on the hills in other parts. Trees in the vicinity of Shasta, yellow pines for instance, will grow at the elevation of 500 feet. At Tehachepa we do not find them at 4,000 feet; they follow the Sierra Nevada on that same slope. As you get south the timber takes a higher elevation. I cannot see any objection to that reservation for timber lands. It is only when it bears on a poor farmer that you will distress him. I think it would be well to couple it with a provision protecting any improvements which he made. In other words, when a man goes there and makes a home, give him that home.

Q. What do you think of the propriety of the withdrawal of large bodies of public land in this State for alleged mineral purposes, there being no evidence that they contain any mineral?—A. In addition to the lands in the foot-hills of the Sierra Nevadas, made mineral by the affidavits of the miners, say from 1850 to 1852, when placer mining practically ceased on the benches and bars of the rivers—in addition to the land made mineral by the affidavits of the miners at that time, Commissioner Drummond, by an order, at one fell swoop, reserved from the public domain more than two million acres of land along the base of the Sierra Nevada Mountains, along the foot-hills stretching through three degrees of latitude, and having a width of 15 or 20 miles, and required that any farmer who settled upon any portion of these reserved lands should be at the expense of advertising, of first posting his notice on the forty-acre tract, and then by publication in the newspapers fixing the time when he would appear

at the Land Office with witnesses to show that each 40 acres was more valuable for agricultural purposes than for mineral. The expenses and this bother more than doubled the cost of the land to the settler, and then, when settled, it was not settled, for the patent itself still reserved any mineral, should such be found thereon. All mineral rights were reserved. He was still liable to annoyance and bother from his neighbors or any person who disliked him. He was bothered because his land was so open to invasion that it was difficult for him to raise money upon it, and the fact has been that this withdrawal has probably prevented the settlement of from 2,000 to 5,000 families on one of the most valuable sections of the State, which is left in part for the use of cattle and sheep men, who are interested in keeping the mineral decision hanging over it to exclude settlers from it, and thus it pays no taxes to the State or county. It is used only for grazing purposes and by the few people who cut the oak wood that grows upon it.

What should be done is this: There were some placer mines among these lands thus reserved, principally upon the benches and bars of river courses, but very little anywhere else. They were practically worked out before the Chinamen took hold of them in 1868, but still the reservation is on this land, the climate of which is better than in the valleys, and upon which oranges and semi-tropical fruits can be grown and which will produce the best berries and fruits in the State. It is also a productive and valuable land for wheat. It is almost practically unsettled, growing out of the difficulty of obtaining a title and the uncertainty of the title after it is acquired. The whole effect of this thing is that it is injurious to the State, and the order, in the interest of the public, ought to be revoked, and the burden of proof should not be upon the farmer but upon the miner to show that it is mineral, if he finds a mine there. That order is used for the purpose of keeping large herds of sheep and cattle grazing over the land without paying anybody for the privilege; and the herders and stockmen make it so expensive to the agricultural applicant that he abandons his application. After he has been to all this expense of making proof he gets nothing, for the mineral is still reserved if any is found on his land. When a man gets a title to a piece of land, puts on his vineyard, his apple trees, and his home, and digs his well, give it to him clean; do not take it from him afterwards; do not leave him open to wandering prospectors, who can come into his orchard and hunt for a mine that has no existence whatever. If there is any mine there let it be his.

Q. In your opinion, should not the government, when it surveys a township, return it properly classified, and thereafter adhere to that classification?—A. No, I would not do that; but when a man obtains a title to it let it be his undisturbed. They cannot well do that, because if your surveyor, in surveying that land, saw a man digging for gold upon it he would classify it as mineral and return it as such. In two years afterwards every particle of gold might be worked out, and when it was worked out the land would cease to be mineral and that character should no longer attach to it. I sent to the Secretary of the Interior oranges raised on land that was classified as mineral land, but from which the mineral had been exhausted. These reservations of mineral land admit of the most miserable system of living by men who live on it and cannot get any title to it, and they just grub along. They are not like men who own the land; they don't pay any taxes, except upon their possessions, because the government owns this land. The fact of the matter was that the department at Washington did not originally understand the condition of the mineral lands and what part of the mineral belts were valuable, and in a fright reserved everything, and thus tied up all the land in favor of the mineral which has been gone for years. If a scientific classification were made in the future, I think the government ought to adhere to that classification; but I do not think a clean title to the land should ever be disturbed. If a man purchased it for agricultural purposes he should own it, and everything in it should be his, clean.

Q. What and where are the lands that are valuable for grazing purposes exclusively in California?—A. I would call all the lands in the southern portion of the State below the timber line on the hills, and the mesa lands above the plains, and the lands of the valleys where the valleys do not receive to exceed an average of 8 inches of rainfall, grazing lands. Then, further, I would call grazing lands all of the lands in the valleys where there is not sufficient water in the rivers that can be taken out for purposes of irrigation—below the timber line of the hills, in fact. Now, wherever in the southern parts of the State the waters of the streams can be directed on to the mesa lands, or on all the valley lands, so far as that water extended and can be spread over the land it would cease to be grazing land; but the very line above which the water cannot reach would be the line of grazing land, until you get up to the timber line. So you see that I consider that grazing land consists of the various classes of land that are fit for grazing and nothing else—not from the quality of the soil, but simply from the want of water. The soil may be entirely fit for agriculture. Where the snow-water fails to produce enough grass in the spring and the winter rains are not sufficient for irrigation, these would be grazing lands, until you got up higher in the

mountains where there is an increase of rainfall due to elevation—there would commence the timber lands.

Q. What can be done to make pastoral lands, as we have defined them, available to actual settlers as pastoral homesteads?—A. They should be surveyed in tracts, having regard to the springs and small streams that may be found upon them, and sold in large bodies, the whole thing having relation to the water for the use of the stock that may be found upon any portion of them. For illustration, take the State of Nevada, which contains the largest bodies of this land. The bunch-grass that grows on the hills is very nutritious and bears an abundance of oily seeds, which fatten all kinds of stock; but those hills only have a value for grazing purposes when there is enough water to supply stock. When the water cannot be found within reasonable distance of the stock, to which they can travel back and forth morning and evening, they have no value, for the reason that stock cannot be grazed over them for want of water. They are then left in a state of nature, to be sold by the government. Pasturage land should be subdivided in large tracts with reference to the water, so that each tract may, as nearly as practicable, be endowed with a suitable proportion of water, and then sold at private entry.

Q. On account of the scarcity of water at times, would it not be well to resurvey a certain amount of water and irrigable land, so that the pasturage men could have little gardens and a little feed for themselves and stock; that is, the pasturage farm to include a large amount of pasturage land and a little land fit for cultivation?—A. That is the Mormon system, and it seems to work very well with them. My opinion is this, that so far as it is available that land should be got into condition for cultivation by some common ownership. Take Walker River here: I would first get the land in a position so that it could be bought if practicable. Large tracts could be irrigated by the water from the river which could not be irrigated if you prohibited a man from obtaining title to more than 160 acres. No man or company would expend $15 or $20 per acre on such small tracts. I would get that land in position, so that it could be acquired in quantities sufficient to warrant capitalists in putting in dams and digging irrigating ditches, so as to enable them to reclaim it and sell it in small tracts, properly supplied with water, to actual settlers, and that should be the first object. Whenever you get a man attached to the soil by that process, then you settle up the country and create at once towns and settlements, churches and schools, and advance the interests of the whole community. Then, as regards the land that lies back of them, fit for pasturage only, I would provide that at convenient distances from the river, say three-fifths of a mile, or whatever might be thought best, the water remaining in that river or in those ditches should be opened by law to the back pasturage country, and it should be given to all the people along the banks of that river for the purpose of watering their stock, and by that method the irrigable land could be utilized and the pasturage land utilized, for the men who owned the stock should have an indefeasible right to get their stock to that water. I would not provide that pasturage men should own the steppe back of the river, but I would provide that the farmer should own it all. At the same time I would give the right to the pasturage men to use the water for their stock.

Q. What amount of pasturage land would be equivalent to 160 acres of arable land?—A. I cannot state at all. I have seen in the Mohave Desert large bodies of 640 acres, *afilarée* covering the whole ground, and I have seen it the next season without a single spear of anything that looked like vegetation. It would support immense flocks of sheep in one season and would not support a rabbit the next; thus it depends upon the nature of the grass. Take the bunch-grass: I have seen lots of land bearing that grass that looked so barren that a crow would not light upon it, and yet it would support stock all the summer; it depends upon the native production of the soil. I think there should be—if it is for cattle in the ordinary grazing country—it should be sold in tracts of four or five thousand acres; not less than that; it is difficult to tell exactly. I will state it this way: it should be in such quantities that a man of ordinary means who proposes to follow stock-grazing shall be enabled to acquire a sufficient amount of land to graze his sheep, and the land should correspond in area with the quantity of cattle and sheep that an ordinary average farmer who goes into that business would naturally have.

Q. What system would you suggest for disposing of the irrigable land that will best secure its occupation by actual settlers; what are the difficulties at present in settling this land, and what system would relieve settlers of those difficulties?—A. I do not know why the desert-land act, if it were made more liberal, is not a good law. There is hardly time enough allowed for persons to complete their work and take out the water. Irrigation works in California on the land that does not naturally receive a sufficient amount of water by the rainfall is an expensive work of engineering, and then of actual labor. Haggin & Carr, of Kern River, have expended in irrigation and distributing ditches nearly one and a half millions of dollars. Probably in Kern County, near Bakersfield and south of Kern Island, they have expended that much money in dams and irrigating ditches, and other large sums have been expended by other par-

ties in cultivating land, not to exceed half a million acres. These moneys have been expended and they have acquired title under the desert-land act to some portions of the land, but to other portions of it the title is still inchoate and imperfect, for the reason that, while the main ditches are there and some of the main distributing ditches, a full compliance with the law has not been made, for the reason that three years have expired and the requirements of the law have not been fully met. All that money has been expended, yet the detail work has not been entirely completed. In other words, there is not time enough given.

The fact is this: probably $3,000,000 have been expended and the work is only partially completed; the details are imperfect, and the government devils then commence suits and commence investigations at the instance of anybody who makes an affidavit that such and such a piece of land, that he might want, is not desert land; and it costs them a large sum to employ lawyers. Then it is tied up in the departments and remains unsettled for a long time. These people have their money invested in those improvements and will not get any returns except their alfalfa and some other crops they are raising upon it. They are unable to bring in any settlers, as they desire to do, for the reason that they are still left in this unsettled condition. It requires large capital, and it requires the expenditure of that capital without returns for a number of years to reclaim this land.

The men who go into these operations do not propose to farm the land, but they propose to get the land from the government and to expend five or six millions of dollars or more in irrigating and bringing water to it, and then they expect to sell it for $15 or $20 per acre, after a number of years, to people who will cultivate the soil and make homes there. Therefore, the law, though well enough in part, must be amended so as to make it available.

Q. What objection is there, if any, to the government reserving every other section of this desert land and allowing it to be irrigated in alternate sections?—A. That would not work, because no man would want to spend five dollars per acre to bring water to one section when the government retains the neighboring section for somebody else, whose land would then be irrigated without pay.

Q. As I understand you, the great body of land to be irrigated can be redeemed only by the utilization of the large streams, where much capital is required?—A. That is it.

Q. What proportion of land can be irrigated by the small streams and by utilizing the larger ones, where only capital can do it?—A. I think very nearly all the small streams in the southern portion of the State that can be utilized for irrigation on small tracts have been acquired, and are in use and occupation. What remains are the large rivers, that can only be utilized by the expenditure of large sums of money. My idea is that this land, after the main ditches are taken out, where the main distributing ditches are not yet constructed, they, the latter, can be constructed for $4 or $5 per acre. Tulare Lake, on its eastern side, has a hard clay bottom, and that clay bottom extends up toward the foot-hills in the form of hard-pan—how far up toward the foot-hills, I cannot tell; but King's River, Coon Creek, Rockwood Creek, and various other streams that flow down from the mountains have brought down sediment and leaves and other trash, and made a deposit upon that hard-pan on the shore of Tulare Lake about four feet thick. This sand and silt have made up the richest kind of soil, and ditches have been taken out of King's River for the irrigation of that soil.

The slope from the hills to the lands of the Muscle-shell Slough Company is about one foot to the mile. An irrigating ditch has been brought across the northern end of the section, flowing along the section line, and that water settles through the sand and silt and runs toward the lake slowly on that hard-pan, and gives up its moisture to vegetation which grows to a distance of a half a mile from the lake. This is the most inexpensive irrigation in the world. That condition of things only exists where the rivers have brought down deposits which rest upon hard-pan like that; but I do not know that such a condition of things exists anywhere else. So, you see, it is hard to state what irrigation will cost.

The great body of irrigable land now remaining in California is not available for poor men. Take the stretch of country between Kern County and Tulare Lake. There are probably 250,000 acres of plains land, with occasional patches of alkali ground, because where there is not sufficient rainfall the alkali deposits are always found. Take that country of 250,000 acres, and it is almost impossible to irrigate it, unless the remaining waters of Kern River should be taken out and extended along north of that section of country for a distance of, I should say, 40 or 45 miles, and then brought down and spread over the ground by ditches. This is the only process by which it can be irrigated (unless they can find artesian water), and probably it cannot be done short of an expense of three or four millions of dollars, if, indeed, there is sufficient water in Kern River still unappropriated. It is nonsense for a man to take 160 acres or 640 acres or less of desert land. The only remaining land available for poor men, then, are the pasturage lands which are still left. There is a stretch of country 450 miles long from Redding to Tahechepah. If you take off the mineral restriction from that land it

will be available, for it is some of the best land in the country. It is 450 miles long and 20 miles wide.

Q. Outside of this land there are no other lands, are there, except the grazing lands? Now, would there be any objection to extending the homestead privilege to the pasturage lands and make a homestead include a sufficient amount for a pasturage farm?—A. There would. The man who proposes to go into the grazing business has some capital, or else he would not have money to purchase his sheep and cattle. That man should be made to buy the land from the government, and not have it given to him. If he has money enough to enter the stock business he has money enough to purchase his land. I would have a surveyor to survey it and grade it; and he should be a man of some intelligence, and he should be required to be more particular in reporting the character of each 160 acres, and note all the grasses that are upon it, and the streams that are upon it, and all other objects by which a commissioner could get a general description of it, which would enable that commissioner or some one else properly authorized to grade that land. Then it should be sold in these certain tracts, at a price which would be a low price for the government, for the use of these grazing men, instead of giving them homes upon it.

The surveyor who makes the survey of these pasturage lands should be required to give a statement in regard to the character of the soil, and the vegetation that grows on it, and, approximately, the water there is, and any other information that might occur to him that would be of benefit to a commissioner, in order that he might pass upon and grade the value of this land. This value should be fixed by the government at the cost of this survey and examination, and then these pasturage lands should be sold in convenient tracts of, say, from two to five thousand acres to persons who desired to occupy them for pasturage homesteads, at the cost of surveying and grading.

Q. Where should the title or right to the water rest? Who should own the water?—A. The State should own the water, and the State should regulate and control it. It should regulate and control it by a commission that should have an almost absolute power to do justice to the parties who take out the water and those who use it finally. As we stand now, it is in the next fifty years to be a great source of trouble, strife, and bloodshed. The people who use that water will be the slaves of those who hold it. This is true to some extent to-day. With a parceling survey there should be a physical survey, but with the present manner of surveying it cannot be done with sufficient accuracy to make it possible for irrigation. For irrigation contour lines and elevations must be computed with the greatest and minutest exactness, and the ordinary surveyor is not competent to do that.

Q. Suppose the land was so classified that the man who obtained title to a certain tract of land obtains title to it as irrigable land. Now, having set aside a certain amount of the land as irrigable land, should not the water right inhere with the land and pass with it? How would that do?—A. That classification cannot be made accurate enough. Take the land lying between Kern River and Tulare Lake, above Buena Vista. The question of how much of that can be irrigated from Kern River depends upon where you put in your dam; it depends upon a great many other considerations also. The surveyor may report that all of a given tract of land is irrigable, and probably it is irrigable, but it will take a million of dollars to irrigate the whole of it. He cannot very well classify the land, because he must know where the water will reach; below that point it is irrigable land; above it is pasturage land. It is the line of the ditch that makes the distinction, and it is necessarily an engineering problem where the dam should be put, and the dam being put there you have next to ascertain where the water can be taken to. The question is, can the water be taken out here or taken out there, and that question must be left to the State, to be under State control. But yet the government must classify the lands as nearly as possible; and then it is absolutely necessary, if they are classified and sold, and it is afterwards found that a piece of land that is put in one class turns out to be of another, that there should be no tampering with any man's patent, as in the mineral cases; for when he gets his title from the government it should be final and complete.

The settler should never be bothered with these mineral questions. There should not be so many reservations in his patent. When a poor farmer comes to make his improvements he often finds there are so many reservations that the title means almost nothing. There should be no such condition of things. Whenever the land is sold, it should be sold absolutely and clean.

Q. Would you aid irrigation corporations by giving them each alternate section?—A. You cannot do that; this alternate-section business prevents anything being done.

SAN FRANCISCO, *October* 8.

B. B. REDDING testified as follows:

The land of the Central Pacific Railroad runs through Nevada, down the Truckee River, going east; then across the sink of the Humboldt and Carson, and into the depression of country into which these two rivers empty, where their water is then

evaporated; then up the line, following the general course of the Humboldt River to its source at the Humboldt Wells, and so on into Utah, around the head of Salt Lake to Ogden, where it connects with the Union Pacific. The general character of the land in the sections above referred to is desert, and like all other deserts is made so by a lack of sufficient rainfall. The rainfall is less on that line at Wadsworth and in the sink of the Humboldt than elsewhere, not averaging to exceed three and one-fourth to four inches annually. It gradually increases, following up the Humboldt River along the line of the railroad to Fort Halleck, to the Humboldt Wells, which is the highest elevation on the line of the railroad, and which point is the source of the Humboldt River. Here the average rainfall is 12 inches. The consequence is that while there are good pastoral lands on this line and good natural grasses, and occasionally small patches of arable land, there is not in that portion of Nevada much arable land, except by irrigation. There are some natural grasses on the hills, such as the bunch-grass, which appears to be fitted by nature to live in an arid and dry region, and which produces some considerable nutritious food for stock. Wherever the water of the Humboldt has been taken out and distributed on the flat ground on its banks the land is found to be very productive. It is only in a small degree utilized for the purpose of cultivation, because the putting in of dams and irrigating ditches involves a large expenditure of capital.

The land on each side of the Humboldt River, which is on the line of the railroad, is partially owned by the railroad for 20 miles on each side. The sections belong alternately to the railroad company and to the government, the odd-numbered sections being those owned by the railroad and the even-numbered sections by the government, held for the use of settlers. These government lands are now only subject to pre-emption in tracts of one hundred and sixty acres. Capitalists are ready to invest large amounts of money in taking out the waters of the Humboldt River and carrying it up to the edge of the hills and then distributing it down over the flat lands, provided they could receive the benefit of their investment, which, as the law now stands, is not permitted to them. The railroad would willingly sell the odd-numbered sections at the government price of $2.50 per acre, but capitalists are not willing to make this investment simply for the land that they could purchase from the railroad company, for the reason that the benefit of their investment in the construction of irrigation ditches and dams, distributing ditches, &c., would only reside one-half in them. One half of it would go to any settler who saw fit to pre-empt 160 acres of this land from the government after it had been irrigated. The result is that capital cannot be found to make these investments. A further consequence is that this section of the country is unsettled and comparatively non-productive, and promises to continue in the same condition while the law remains as it is now. The bottom land of the Humboldt River susceptible of cultivation varies in width at different points. It would be difficult to say how wide it would average, but I should say not to exceed 10 or 15 miles through its entire length. Back of these lands are the pasturage lands on the hills, looking bare and unproductive, but in fact, year by year, containing variable quantities of bunch-grass and other native grasses which are fattening for cattle. These lands can never be used while the earth is at its present climatic condition for any other purpose than the pasturage of herds. They now support large herds of cattle, and are really divided up among the owners of herds of cattle, who, by common consent, occupy distinct sections without any ownership. It is merely conceded that from such a hill to such a hill a certain area of grass land shall be under the control of one person, so that the most of these pasturage lands are utilized without title from the government. The people who graze over them have no desire that there should be any title.

Now, to make these lands available and settle up this section of country with thrifty and industrious farmers and a grazing population, who would utilize the bottom lands for agriculture and utilize the lands back on the hills for grazing purposes, requires an entire change in the present system of laws controlling and governing these lands; but just how this should be done is a question for the consideration of Congress. All of these lands might be utilized by several methods, and be a source of revenue to the government and add prosperity to the country. If the government were to take back the odd-numbered sections throughout this whole strip of country, cause them to be surveyed again with reference directly to their facilities for irrigation, and then allow them to be sold in large tracts and bodies, so that persons having capital could enter them at private entry, irrigation works would be constructed, dams put in the rivers, distributing-ditches made, and these parties, having the lands so irrigated, would then sell them, with rights to the water, in small tracts to actual settlers, who would soon fill them up and cultivate them. If this were not considered advisable, then the government should take from the railroad all the odd-numbered sections on one side of the railroad—the land of the railroad lies along the bank of the river—and give the railroad in exchange the even sections on the other side. This would enable the railroad company to have all the lands on one side of the river surveyed, with a view to their sale to capitalists, who would put in dams and irrigating ditches, and, after irrigating

them, would resell them to the settlers at a profit, while the settlers would cultivate the soil and make it available.

If this should not be approved, then the one other plan that I see is for the government to take back the odd sections for a distance of ten or twenty miles in alternate blocks and give the even sections to the railroad for the same distance, in alternate blocks, so that the blocks of land could be got together, which would be susceptible as a body to irrigation. Then the government could arrange its portion in any way it saw fit, and would probably adopt the same system that the railroad would adopt, which would be to see if the several bodies could be irrigated, and then sell them to capitalists to take out the water to irrigate them with.

These are the various plans that have occured to me. The object of any system to make these lands available must be to get together every portion that is susceptible of one system of irrigation, by a ditch which could be taken out, say on the right hand, and carried to the foot-hills as far as that ditch could be extended. Everything below the line of that ditch would create one irrigating district, and the expenditure of money in putting in that ditch, so far as the flowing of water into it is concerned, would irrigate all the land between the ditch and the river and would constitute what would be one block of land susceptible of irrigation at that point. Any system that will make these lands available to the railroad must be arranged in that manner. Nature has so formed that country that I cannot conceive of any other plan that will do it. I want to say that while these lands remain in the condition they are, with this divided ownership, nothing can be done, except in a desultory manner, for settlers in that country to make it available for agriculture. Men will not invest capital in one-half of the lands. They will not invest one hundred thousand dollars' worth of capital to bring in water which every man can use by going to the land office and obtaining title to the even-numbered sections. It must be so arranged that capital can be induced to bring the water to the land. Any system that will accomplish that will accomplish the settlement of that country; but in the condition it is it must remain a desert that cannot induce settlement there, because it costs too much to get out the water.

It is no use to go into the history of our form of government; but one of the ends for which this government was created was to get rid of primogeniture and entail. That fear of large holdings, growing out of the existing faults in the old country, has been one of the dreads that has worked into the public mind everywhere. I think there is no such danger in this country, for the reason that these wealthy men must die after thirty years, and cannot leave their property entailed. It is divided up, and when the first heirs die the same condition of affairs takes place. I have known a man who died here —one of the wealthiest men in the State, who died four or five years ago—and now his estate is all scattered; and within about thirty years from this time those holding this estate will die, and it will be redivided again. In that way the men that got hold of large grants in early days were all men of middle age, and generally men who came here in 1849 with some capital and some experience. They saw the State was filling up with population, and instead of going to mining they got hold of the Spanish ranches. Most of these owners are now men long past middle-age of life, and they are dying, and their estates are being divided. Another generation will see all these estates divided up; and in two generations they will all be in small tracts and farmed. That prevailing fear in the country where there is no primogeniture and entail is a fear that, to my mind, in another generation will have so worked itself out that it will have disappeared.

Now then, to come back to this other question: suppose there are 30,000 acres in a body that can be irrigated through these ditches, and that it will cost $100,000 to bring out the water, or $200,000 to bring out that water to irrigate that land, and that capitalists who invest in that operation did it not for the purpose of farming that land. They cannot farm it. Farming has never succeeded in large tracts. I don't know of ten men in the State who at the end of fifteen years have not made an absolute failure of farming over a few thousand acres. They do not invest in these ditches and these irrigation works and in these lands with the object of getting an estate to leave to their children. Capital is too active here. Their object is to invest their money, having an absolute security in the land, knowing that it is not the land but the water that gives the land a value. Then their object after the work is done is to sell that land in small tracts, at a profit, to people who will cultivate it. I do not know of one claim of irrigation on irrigable lands in this State, made under the "desert-land act," where the object of the parties investing their money was for the purpose of farming that land. Immediately after the water was put on the land they commenced searching for people who would settle on it and buy it of them at a profit, to remunerate them for their outlay of capital.

I want to add again, that if these lands are taken back by the government and these irrigation districts formed, the government should provide in a law that there should be certain distinct lines and roads by which people having their stock in the hills beyond irrigable land should have opportunity for their stock to get to the water of that river, and that should be common and free. That is absolutely necessary to them, otherwise pasturage lands cannot be sold. If a man owned an irrigable tract and had a

right to shut out these ditches from the pasturage lands on the hills, those lands could never be sold, because there is no water, and the stock must have an opportunity to go to the water.

Question. Has the tendency been, in the last few years, to increase the size of the herds and diminish the number of owners, or has the tendency been the other way?—Answer. The condition of things is this: Before the Americans came to this country it was settled by Mexicans. They were a nomadic, pastoral people, and their only object was to feed large herds of cattle. Their government made them concessions of lands for that purpose in large tracts. The most nutritious grasses grow, of course, on the low bottom lands, and keep green the longest in summer; and the Spanish and Mexican grants naturally covered these portions of the land, and theirs was the best land in the State. After the Americans obtained possession of the country they naturally sought these lands and purchased them. As a rule they have turned out to be the best farming lands. The Spanish grants took the best farming lands in the State. When it was ascertained that California was a wheat-growing country these lands immediately acquired too much value for grazing purposes; they were worth more for wheat than for grazing purposes or for orchards. As a consequence these large herds of cattle have disappeared, and the parties who were in that kind of business moved away and went to less productive lands, and we have ceased to be a pastoral people. The only pastoral portion of the State now is in some of the southern counties, some little on the plains of the south in the Tulare Valley; but it is gradually working from the State over into Nevada, Utah, Idaho, Montana, and Southern Oregon. We have ceased to be a pastoral people. Sheep are still owned in large numbers—vast bands—but we have ceased to be a beef-raising people. We still, however, produce immense quantities of wool, and sheep are owned in vast bands all through the State. They are fed in the winter on the dry plains; in the early spring, with the annual grasses, they are driven into the mountains wherever there are any green spots from the Oregon line to the Gulf of California. Everything that contains any moisture they eat. The snow of the mountains remains until it gradually melts in the spring, causing it to fall upon the thick underbrush composed of various kinds of *Cœnanthus*, which was the natural feed of the deer, and this band of sheep eat all of that and leave the ground bare. The consequence is that snows do not remain so late in summer, and for that reason our rivers are becoming more torrential in consequence of the vast herds of sheep that are grazing in our mountains. The raising of cattle and horses in herds has ceased, and that business is being conducted in those pasturage lands in Nevada. The sheep are also extending. The State has probably to-day almost as many sheep as can be grazed.

Now, there is another enterprise springing up. Wherever on the bottom lands alfalfa can be sown and the land can be irrigated, it is so vastly productive that four crops on an average can be cut every year, so that in a small way the farmers are commencing to raise cattle at home—as many as their land will support—and instead of owning a vast range with wild cattle, each farmer now has a herd of ten to fifteen. This adds largely to the supply of beef in this State. In other words, we are gradually changing from a pastoral people and becoming a cereal-growing people. In another twenty years we will be more strictly an agricultural people, because there will be markets in the towns and cities of the State for agricultural products.

I should like to say a word on the *débris* question. A great deal of valuable farming land is being destroyed in Sacramento Valley and along the river bottom by the rivers that flow down from the Sierra Nevada Mountains, where there is hydraulic mining. Some of the ancient river beds created in a former geological era contain large quantities of gravel from which the gold can only be extracted by turning upon these beds large bodies of water under a heavy pressure due to the elevation of artificial streams brought in for the purpose. These, in the course of a season, remove an almost incalculable amount of earth, which is washed into the streams and carried down by the floods and deposited over these bottom lands, destroying for the present their agricultural properties. This is not the only source of injury, for the reason that as cultivation has extended into the foot-hills, mostly where the land is plowed in the winter time, and wherever the earth is broken up by the plow the rains make small brooklets, which run into the valley, and from that into little rills, and from that again into the rivers, carrying an immense amount of earth, which also adds to the quantity brought down by the hydraulic mines. This becomes a very serious question in certain portions of the State. In relation to the legal rights of hydraulic miners, and also as to the legal rights of the farmers whose lands are being destroyed, these questions are now before the courts for determination.

An examination of the maps of the State, in connection especially with those rivers on which there are hydraulic mines, will show, I think, that in every instance there is provided a place for the deposit of this sediment and earth, so that for a great many years, probably twenty-five or thirty, by which time hydraulic mining will probably cease, all the earth and sediment brought down by these rivers during the hydraulic mining can be deposited, and made to create valuable lands without injury to any farms at present in existence, and without injury to beds of the rivers. I will illus-

trate: Right north of the city of Sacramento, north of American River, which flows by Sacramento, and east of the Sacramento River, there is a tract of swamp or overflowed land of about 100,000 acres known as the Swamp Land District No. 1, in the swamp land segregation of the surveys of the State. A large amount of money has been expended in attempts to reclaim this tract of land, but without success. Formerly, before hydraulic mining commenced, the lowest portion of this basin was at about the same level as the bed of the Sacramento River. Since hydraulic mining has been in vogue the bed of the Sacramento River has been raised until it is now some distance above the level of the land in this basin. Formerly the Sacramento River, in the flood period, flowed through sloughs into this basin which became a vast reservoir, and in which it may be said the Sacramento stored some of its water. When the river fell this basin poured out these waters through these same sloughs into the Sacramento and helped to keep the Sacramento in the summer time at its average elevation. Late in the season all these reservoirs would pour out through these sloughs, and these tracts of land would become dry, or nearly so. Since the elevation of the bed of the river it has converted 100,000 acres into tule land below the present bed of the Sacramento River, because the waters from the basin can't run back into the river, the consequence of which is that it remains there, only a portion of it evaporating. This tract of land has in consequence never had any value, and is utterly useless, except a small portion of it used late in the season for grazing purposes.

This tract of 100,000 acres of irreclaimable tule land, valuable only for grazing a short period in the autumn, lies a short distance from the Bear River, on the banks of which the greatest destruction by hydraulic mining has been committed. It is almost a level plain for ten or fifteen miles from the banks of Bear River to the nearest part of this tract of tule land. If a canal were dug from a point on the Bear River across this plain to the head of this body of tule land, and a dam put in at Bear River, all the water of that river with this sediment could be turned through this canal into this basin, and it would become for a time a stationary body of water, from which the sediment would settle upon the bottom, and then gradually overflow as the volume of water coming in increased, and pass out through the sloughs I have spoken of into the Sacramento River. Judging only from the deposit that has been made in the rivers by hydraulic mining during the past fifteen years, I would make a rough estimate and say that this body of tule land would contain all the *débris* that by any possibility could be sent down the Bear River during the next twenty-five or thirty years, by which time hydraulic mining will have ceased.

The next largest injury done by hydraulic mining has been on the Yuba and on the Feather Rivers. On the banks of these two rivers is also provided a depositing ground for the sediment brought down by their water. East of the Sacramento and north of the Feather River is another body of swamp and overflowed land which at a rough estimate I should say contained between 200,000 and 300,000 acres. I have forgotten its number, but it is generally known as Park's Reclamation District. A vast sum of money has been spent in trying to reclaim this district of land, but without success. By a short canal a very few miles in length, perhaps not to exceed five miles, the waters of the Feather and Yuba Rivers, at the time of the year when the deposits come down, could be turned into this basin, where their sediment would be allowed to deposit, and then flow out through sloughs into the Sacramento.

On every other river, so far as I have examined the map of California—and I have examined it carefully for the purpose—near every river on which there are hydraulic mines, there is, down below the foot-hills on the plain near the banks of that river, a tract of swamp and overflowed land into which this sediment could be turned. These lands are now entirely useless except for grazing purposes. The effect of depositing these sediments there, in the creation of new and valuable land, would only demonstrate itself after a series of years when that sediment had been allowed to settle there and deposit so long that it had filled up the swamp at the height to which water comes down in flood-time. Then, by keeping the water away from it for a period of years, it would reclaim itself and become, in my opinion, as valuable as the lands at the mouth of the Sacramento and San Joaquin Rivers, which are now the most valuable lands in the State and the most productive, and which, in my opinion, were made by the same processes of nature ages ago; that is, by the depositing of the silt that came down and was compelled to drop by the water meeting with the brackish tide-water where it comes in from the ocean.

These lands, now worthless except as I have stated for grazing during a few months of the year, would then become as rich, moist, bottom lands as there are in the State. Nothing but an examination by engineers of the amount of earth settlings at the river by hydraulic mining, and an exact comparison of the areas of these basins and calculations of the amount of sediment which is sent down each year, would determine how many years it would take before these basins could be filled up to make valuable land; but this is certain, that there are none of these rivers on which there is hydraulic mining that, near their outlet from the hills, have not basins into which their deposits can be carried to settle and be made fertile land. This problem can be demon-

strated in this manner: The Cherokee Spring Valley Water and Mining Company with other mining companies in Butte County mined for some years before the lands on Table Mountain Creek and Butte Creek were occupied by farmers, until the construction of the California and Oregon Railroad. The distance was so great from the settled region of the country that, although these lands were very good, wheat could not be produced with profit on account of the long distance from a market.

This tract of country lies between the Marysville Buttes and Chico. It is now crossed by the California and Oregon Railroad. Directly the railroad was constructed farmers bought lands from the railroad company lying along the borders of this Butte Creek and Table Mountain Creek. Others pre-empted the even-numbered sections from the government. At the point I speak of where the railroad crosses Butte Creek it is probably fifteen or twenty miles from where that creek emerges from the foothills on to the plain. These mining companies had been in the habit of sending their water and *débris* through Butte Creek and after it reached level lands or plains the sediment was deposited, and in time Butte Creek filled up and this water with the sediment flowed right and left anywhere on the plains. The farmers who bought land from the railroad and those who pre-empted from the government made complaint that they were unsafe in the cultivation of the land there, for the reason that they were liable at any time without warning to have this creek with its sand make a turn in a new direction and overflow their crops. Suits were threatened to be commenced; the railroad company ceased selling any more land in this vicinity, because people were afraid to purchase it. The government also ceased to permit any more land to be pre-empted for the same reason. The owners of this mining company determined if possible to obtain possession of this land, and first ascertained what the odd-numbered unsold lands on that creek could be purchased for from the railroad company. In consequence of the inability of the railroad company to sell it the price had been reduced, and having obtained the price, the owners of the mining property visited the several farmers who were supposed to be in process of injury and engaged with them for their land, and having purchased the land from the farmers, they came and purchased the railroad odd sections, and this having been done, they then built levees on each side of Butte Creek, probably about a mile or a mile and a half from each side of the creek—I can't state the distance exactly. Then they put dams across the lower end, and having done this they allowed the *débris* to flow into it until it filled up and settled upon those lands, and allowed the clean water to flow off. After two or three years they made what had been adobe or stiff clay soil into a sandy loam by this deposit. They then put levees further down on the banks of Butte Creek and did the same thing in the sections below, and through these lands that had been thus made they made a canal through the center and constructed levees so as to prevent any more overflow of the land which had been thus created, and going on below they did the same thing and turned the *debris* into another poor section. And this land thus created takes care of the *debris*, which in turn forms valuable land which they sell for a very large profit and avoided lawsuits with the farmers by taking care of all the *débris* so that they will be no more troubled there by the *débris* while hydraulic mining lasts. Now I think the same operations can be performed on a larger scale in the "swamp-land district, No. 1," and in this "Park's district," the number of which I have forgotten, at the junction of the Feather and Sacramento Rivers, so that all the *débris* from the mines as long as hydraulic mining exists can all be deposited there and tend to the creation of new and valuable farming lands. The only question is who is to pay for this. A number of owners of swamp land in swamp-land district No. 1, that is this body of swamp land north of Sacramento, have stated publicly that they will be thankful if the *débris* from Bear River can be turned into that district as a money speculation; that for them it would be safe to hold that land for the filling up of the country by this *débris* above the floods so that it can be utilized for farming purposes. I do not doubt but that the owners of this Park's district would also be glad to have it done. It is done generally in other countries, and I think it has been done in England, where it is called "warping."

MEMORANDUM FOR LAND COMMISSION, BY MR. B. B. REDDING.

So far as the elevated region—the ridge or "bulge" of the continent lying between the one hundredth degree of west longitude and the Sierra Nevada range of mountains—is concerned, it is, by its physical characteristics, so widely different from the territory to the east of it, as to require a distinctive, separate treatment. With an altitude averaging between 3,500 to 4,000 feet above sea level, it is subject to early and late frosts, with generally a scarcity of precipitation of moisture, and, for the most part, not susceptible of irrigation, and is unsuited to field culture and subdivision into arable farms. Nevertheless it is not wholly valueless. Portions of it abound in precious metals, other portions in coal deposits, on a small portion of it timber may be had, and a very considerable area may be devoted to grazing purposes. In past times this region has sustained vast herds of the native bison and antelope; and experience shows it is capable of supporting equally vast herds of our improved varieties

of cattle and sheep—sufficient indeed to supply the population of the United States with flesh meats if properly managed. Though worth but little per acre, these lands are still worth something for these purposes in connection with the available water supply, and as there are millions of acres the aggregate value is by no means insignificant.

As has been repeatedly shown, a tract of forty, eighty, or one hundred and sixty acres of this land, taken at random, is of no use on these apparently sterile plains for either grazing or irrigation. The lands are dependent on their proximity to a supply of water; therefore the small tracts bordering upon the unfailing streams and springs have a value which, if detached from the surrounding tract, deprives a much larger area of all value. Especially is this true if the land is parceled out into townships and square-mile sections and the subdivisions thereof. The practice has been to adjust these rectangular surveys to the conformation of the country by surveying in this zigzag fashion the sections occupying the watered valleys for sale or occupation, and leaving the more unprofitable hillsides as not being wanted. Meantime the herds roam over the whole area of public lands. In this way the coveted pieces or squares containing water have been and are being sold away from the United States into private hands, leaving the unsold portions valueless to any other than the purchasers of the water. Homesteads sold or granted in this manner are likely to be a serious loss to the country.

Obviously it will be necessary to abandon the present system of connected rectangular surveys by meridianal base lines. The design of its authors undoubtedly was its symmetry and simplicity when applied to the level alluvial lands east of the Missouri. The symmetry cannot be preserved, even if it were worth the cost, for the continuity is broken by the presence of large tracts of French and Spanish grants, Indian reservations, and the like. Moreover, the sixteen or more standard points of departure will not, if prolonged to a union, make a perfect and symmetrical junction. So far as the simplicity is concerned, the records of the Interior Department afford abundant evidence that the confusion and mistakes could hardly be greater if the surveys were run from landmark to landmark by compass, according to immemorial usage, in most countries by metes and bounds. The rectangular surveys may be perhaps retained with advantage in places where they have prevailed and the greater part of the lands disposed of under it, or where the formation of the surface favors it, but to carry this network of perfect squares over the great plains west of the one hundredth meridian and over the mountainous regions beyond would be a manifest waste of public money from which no corresponding advantage would follow.

Congress has also heretofore seen proper to authorize a departure from this method of survey on account of physical peculiarities in the States of California and Nevada, as will be seen by reference to sections 2408, 2409, and 2410 of the Revised Statutes. There is no good reason why this discretion should be limited to those States; but it might with equal reason be applied to the whole of this "dry half" of the country, as it may be called, and made obligatory by statute instead of discretionary with the Secretary.

We are met in the outset with the patent fact that Congress, in pursuance of the policy of opening up means of communication through the public lands with a view to strengthening the arm of the government and opening the lands to public occupation, has granted alternate sections of public lands (the odd-numbered) to railroad companies, and although the value of the reserved sections has been increased so as to be worth more with the roads constructed than the whole was before, the exhaustion of the best lands, no less than the concurrence of public sentiment, dictates that there should be a stop to this policy. A change in the system of surveys would require, at any rate, a change in the terms of such grants, as they should not be made as heretofore, in alternating sections, if there were no such sections designated. The better policy would be to make no further grants to corporations by way of aid, and to recover all grants already made, as fast as the forfeitures occur at least, and perhaps also to recover on terms of equity such other valuable tracts as have been granted or sold away to the prejudice of the public estates. It will be seen that the vast territory west of the Missouri and one hundredth parallel is severed into irregular belts from east to west by grants to four railroads to the Pacific—the Northern Pacific Railroad Company, the Union and Central Pacific Company, the Atlantic and Pacific Railroad Company, and the Texas Pacific Railroad Company. It is true that by the terms of the grant the lands of two of these companies are liable to restoration to the public domain for the unbuilt portions, the time for completion of the Atlantic and Northern Pacific roads having expired, and it will require some renewal of the grant by Congress to prevent that result. As to the other, the Texas Pacific, less than two and a half years remain in which to construct the road across the Territories, and as its eastern terminus is still more than 600 miles distant from the Rio Grande, it is probable this grant will fall into the same state of suspense and liability to forfeiture as the others. In the event that Congress shall determine to make no further grants of public lands to railroad companies, and not to renew any of those which have lapsed,

there will be no difficulty in dealing with these several grants of 60 and 80 miles in width and 800 to 1,200 miles long, as if they were still integral portions of the public domain.

In the case of the grant to the original Pacific Railroad constructed by the Union Pacific and Central Pacific Railroad Companies the case is different, but by no means intractable. These lands have been earned by the building of the road, and the companies have an indefeasible, though inchoate, title to the odd-numbered sections along a forty-mile belt from the Missouri River to the Pacific Ocean, of which they cannot be divested without their consent. Fortunately, in this case, it is as much for the interest of the railroad companies as for the government to desire a change in the system of survey and disposal. Neither party can make the present system work to their advantage, and it appears that they actually stand in the way of each other in the matter of land transfers, the advantage, if any, being on the side of the companies, while the disadvantage is reflected upon the intending settlers and the local industry. This question has been fully set forth by the government directors and by the land agents of the companies.

It is obvious that it would be better to do away with this paralysis of ownership in these lands by placing the whole body of the public domain under one control, and as soon as practicable under the ownership of either the government or private settlers. Various plans have been suggested to do away with the present anomalous relation. The Secretary of the Interior has suggested that instead of the present alternate sections interspersed among an equal quantity of government sections on each side of the roads, the companies should take the solid strip of odd and even sections on one side of the road and the government the solid strip on the other side. This does not, however, wholly get rid of the difficulty, so far as the government policy is concerned; in fact, it leaves the question but little better than before, since it still would be necessary to run the lines by rectangular sections at the two edges and center of this forty-mile belt, which now virtually bisects the public domain, and would not adapt the shape of the tracts to the practical uses they are fit for.

The government directors of the Union Pacific Railroad Company in their annual report for the year 1877 discussed the question at length, and recommend a system of joint leases for long periods. Leasehold property, besides entailing greater complications than our present system of freehold tenure, is contrary to the genius of our institutions, and would tend to perpetuate the control of the railroad corporations over vast bodies of land adjacent to their roads, which the granting acts and sound public policy would reject as undesirable and not contemplated. Neither of these propositions, in our judgment, goes far enough, though either of them would be an improvement on the present plan, and if the cardinal distinction of the technical "section" of our surveys is to be maintained, one of them may be chosen. The present ownership is tantamount to an undivided half, and it may as well become legally and equitably an undivided ownership, terminable at some future date either by operation of a sinking fund or by voluntary agreement. But our view of the necessities of the public lands would lead us to obliterate, so far as this territory between the hundredth meridian and the Sierra Nevada Mountains is concerned, all segregation of odd and even numbered sections as unnecessary, wasteful, and inconvenient, and instead to merge these reserved belts all into one undistinguishable public domain, to be dealt with the same as the rest of the public lands, with the single exception of the formality of passing the title and disposition of the proceeds of the strip within 20 miles of the line of the railroads. At present, in theory, this immense territory is to be subdivided into several hundred thousand checker-boarded 640-acre squares, the railroad companies taking every other square.

It is useless to carry out this purely arbitrary demarkation; for economic uses they are one and inseparable, and they may and ought to be so in treatment. It is believed that the railroad companies would consent to surrendering their lands back to the control and disposition of the government, and, if we mistake not, have offered to do so upon consideration of an allowance upon their indebtedness to the government growing out of their subsidy bonds. Even this is not necessary, and their consent can probably be had, or at any rate it can be proposed, to a plan whereby the whole of the lands within the limits of the reservation shall be thrown into the general scheme of survey and disposal as herein outlined in which the territory shall be cut up and surveyed into tracts of such shape and size as will best adapt them to their proper economic uses. In this system the boundaries will be settled of each particular parcel by these considerations, in which, of course, the shape and contour of the surface of the earth, timber, and water supply will have due weight. Townships and sections need not be run at right angles as now. The lands will be surveyed geologically and economically, with a view to allot the water to the land it naturally serves; and not, as now, sell the water away from or without the adjunct of the area of land it confers value on.

In regard to compensating these railroad companies for this surrender, the difficulties are not so great as may at first glance appear. It happens that both the Central

and Union Pacific Companies, and perhaps the Kansas Pacific, and Atchison, Topeka and Santa Fé might be in part included, have had to borrow money upon the pledge of these lands for the completion of their roads. The lands have been mortgaged to secure bonds to the extent of $10,000,000 in the case of the former company, and to the amount of $10,400,000 in the case of the latter. By the terms of these mortgages the net proceeds of land sales are to be used in redeeming the bonds themselves, and a special and particular release of each several tract by the trustees is required in conveying title to the purchaser. Bonds have been redeemed by the Central amounting to $———, and by the Union Pacific Company, $———; leaving $——— and $——— outstanding respectively. The Kansas Pacific lands west of the hundredth meridian are mortgaged separately, and could be dealt with in a similar manner.

Now, it occurs to us that this same machinery might be made use of by the United States to get rid of this lien, and to pass a perfect title to purchasers. If Congress will but pass the act herein recommended relating to the survey and disposal of public lands, one section of which shall provide for the recompense of the lands granted to these Pacific Railroad Companies subject to these mortgage claims, giving to the United States authority to survey and parcel them as it may see fit without regard to section or township lines, and to dispose of the same like other public lands at such price as it may elect, not less than $2.50 per acre until otherwise ordered, one half of the proceeds of any such tract or parcel, any portion of which shall be situated within the twenty-mile limit from the center line of said railroad, to be paid over to the trustees under said land mortgage and be by them applied to the redemption or purchase of said bonds; and the assent of said trustees shall be necessary to the conveyance by the United States of any such tract or parcel, and shall not be refused nor withheld from such conveyance upon the tender to them of one-half of such purchase money at the time said deed or patent is offered for signature. These bonds are due between the years 1887 and 1895, and will within fifteen years be nearly, if not quite, extinguished. When paid and canceled, the one-half of the proceeds of the public lands sold thereafter might be turned into a sinking fund for the extinction of the indebtedness to the United States in cases where there was any.

The lien of the land bonds is superior to that of the United States, and it will acquire perfect title by their extinction. The lien of its debt claim is subordinate to that of the first mortgage bonds. Every bond of either class redeemed out of the proceeds of these lands is therefore improving the tenure and security of the government for its debt. The practical working of this would be sales of a hundred or possibly a thousand acres for one now sold. Instead of confining purchases to a single quarter section containing a spring or water course, with the expectation of grazing several thousand acres adjacent, the lands would be divided according to their industrial fitness, and who wanted to buy water must buy land with it in this dry region. In this way there would be no tendency to monopoly of water such as is now witnessed, nor such liability to breaches of the peace and demoralization of steady pursuits, where all are alike trespassers on the public lands.

WASHINGTON, D. C., *December* 3, 1879.

To honorable Public Land Commission:

The foregoing is respectfully submitted as a practical solution of the difficulties which now surround the lands of the government and the railroad companies in the great basin between the Wasatch and Sierra Nevada.

B. B. REDDING.

Testimony of J. H. Redstone, president of the California Protective Union, San Francisco, Cal.

J. H. REDSTONE, president California Protective Union.

It has not been understood by the settlers throughout the State that this Commission designed to enter into the subject of lands in the manner it has entered into it—*i. e.*, in regard to the disposition of the land. It was supposed that they were here for an especial purpose. I regret very much that we cannot have some witnesses here from some other counties.

I will state first that the views of the settlers of the State relate more especially to the social effects of the jurisdiction of the land system than to the moneyed consideration. We believe that it is for the interests of the State that the most useful settlers should be subserved in the disposition of the land—*i. e.*, those who intend themselves to improve the land. We are opposed to the sale of land *in toto*. We do not believe it should be sold or homesteaded only under a system that will inure the occupation of the land by actual settlers. We do not think that it is proper for the government to be in any hurry to dispose of the land; that it is a better custo-

dian of the people's interest in the land than any one else. We believe that these lands should be held in the interest of the coming generations, as well as for ourselves. It has been stated that we have useless lands. Lands that at the first seemed to be barren and useless have proven to be the most valuable lands in the State. The mountainous lands are among the most valuable lands we have, and they have become valuable in supplying the world with the finest of fruits. The best and finest fruits can be raised upon the slopes of these mountains. For that reason the water rights should not have passed into the hands of the State. They should be reserved for the people. Every inch of land that can be irrigated by that water should be protected; the water being a part of the land, should not have been disposed of by the State in such way as to jeopardize the future reclamation of the land in any particular, because the land is dependent upon the water for its irrigation.

It has been said that the lands cannot be irrigated by the settlers themselves, and that they should pass into the hands of large owners or capitalists, who would irrigate them and sell them. I understand the railroad companies have suggested that the government should exchange the odd sections, thus bringing their bodies of land together, and by that means they would secure the whole of the irrigable lands and some of the timber lands. By that method they would certainly secure the whole of the irrigable land, and the people would not know how it was done. It is my opinion that if we will look at the history of the organization of these land-owners we will find that the land has been taken up and held with the prospect of profit; that it is not in the interest of people that the land has been taken up, but it has been taken up and withheld from settlement until the clamor of the people for land has forced it into the market at a high price. That is the result of owning land in large quantities. It is not to bring the land into the market, but to keep it out of the market until it is worth a high price. Anything that tends to keep all the lands in the hands of one individual is detrimental to the people. The character of the settlers who occupied Miller and Simons's lands is that of men who spent their earnings in the whisky-shops.

We propose that the government shall sell no lands. All the land sold is for speculative purposes. It should be homesteaded, and the land should be open only to actual settlers in order that it may be scientifically and properly improved. We contend that no land can be properly improved, even by irrigation, if it is held by a large company. There is a company that has 1,500 miles of ditches; but yet there is strife there, and there will be the same result here—it is only a difference in degree. We are opposed to the monopoly of land in any form. We believe it is taking away our rights. The settlers of California believe in that policy which will produce the largest number of men.

Q. What have you to say concerning timber lands?—A. I contend for the present that we should not be in a hurry to dispose of the timber lands. Whenever a man is willing to take up 160 acres, or whatever more is deemed by the best judges as the proper amount, he should be allowed to take up that amount, and if he wants to build his little ranch there, and have the timber to sell, he should have the right to cut it down and sell it to the men who have the saw-mills. The timber land will not then be taken and the land stripped of its timber where there is no market for it. I think it is the duty of the government, when they find out the condition of affairs here, to prepare these lands as fast as possible for homes by a general system of irrigation. It may be irrigated, it may be cut up with a perfect network of transportation, by which it may be made one of the great supplies of land of the nation. I would have a national system of irrigation.

Q. How would you protect the timber?—A. I would protect—I would have the same safeguard thrown around the timber that there is now. I would allow no man to cut the timber for sale on the government land. I would protect it by punishing depredators the same as for any other criminal act. I really think it can be done by opening up our lands to actual settlers, and by throwing off all this disguise and all those false provisions which, it is pretended, are in the interest of the people, and whereby the large corporations of this State and other places have got their interest together and have got the public machinery to working in their own interest. I think that we ought to stop all that as soon as we can. Large tracts of land would be taken up and a system of irrigation adopted if men could be sure that they could settle on the lands without being overreached by these land grants. The grants ought to be settled and their boundaries fixed. The government ought to exact a survey in every instance, and it is the duty of the government to take hold of the matter and have it adjusted. I think it is the duty of the government, first of all, to have the land in this State surveyed thoroughly, so far as these conflicting titles are concerned in regard to large grants. It will stop the trouble and bloodshed which will come after awhile if it is not done, for the people in Tulare County, who have settled on the land and taken out the water, will not leave these lands alive; and if they are forced to pay the price demanded for them by the owners I believe they will either live there without paying it or die there.

I believe in the timber ranch the same as the agricultural ranch. In the valleys timber

is one of the best crops that can be raised in that country. I would limit the timber ranch so as not to have it exceed 160 acres. The homestead laws are generally made in such manner as to deceive the people. The laws are usually made so that the people cannot fulfill the provisions of the law. These land laws ought to be made definite and clear. We have no laws. Our laws have all been destroyed, so far as their practical use is concerned, by this law of precedent. I would not have any lands sold. I would leave the ownership in the government. I do not see any practical way of doing that, but it would be the best way. I think the government ought to hold it in common for all.

Here is another point. It has been suggested that $5 per acre should be paid for arable lands. Five dollars would not be too much for the timber lands, but there is not a man, under the present rate-system, who can go on a piece of land with the expectation of earning that land in a lifetime. No man should be forced to purchase the land. He cannot take care of his family and save enough money to do it. All the government lands are taken up here.

I am opposed to an increase of acreage. I think it would be a benefit to but a few men. The government can dispose of these lands as the people in Tulare Valley got them. As soon as a man undertakes to pre-empt a piece of land now, and he gets one or two neighbors, here comes a large land owner and takes a large piece of land there; the chances are that he will be surrounded by large land owners. You can prevent them taking these large tracts of land in two ways. I would take the way Pennsylvania has done, of forcing these large men to improve their lands. I do not believe there are but very few men who can take large tracts and improve them. I should have no land sold by the government except such land as was to be occupied as homesteads. You give me a right to do this and I will bring you one million of men who will take these lands and irrigate them. The moment this land is opened up to settlement they are all taken. As long as men have the money and power, as long as men are selfish, they will wrong their fellow-men and monopolize the rights of others.

I am aware that irrigation—I have been a civil engineer for some time—can be had at a nominal expense, compared with the expense that heretofore has been considered as necessarily attending it. A gentleman will testify before you who is an expert. He will tell you that in all the coast this thing can be done at a nominal cost, and at an expense which will add but little to the cost of the land. I would prefer that the government should manage these irrigation ditches and then offer the land for sale, instead of letting companies do it.

Q. Have you anything to say concerning the desert-land act?—A. The desert-land act is one of the greatest engines by which such things have been done. There are many others, the Mexican grant system being one of the most prominent. They are false grants more than anything else.

Testimony of J. A. Robinson, San Francisco, Cal.

To the Public Land Commission:

GENTLEMEN: With reference to the mining law I will state the act of July, 1866 limited mining claims located subsequent to that date to 3,000 feet in length, and recognized the validity of all the locations in force at that date.

The act of May, 1870, referred especially to placer claims.

The act of May 10, 1872, reduced the length of mining claims to 1,500 feet with surface ground 600 feet in width.

The act of July, 1866, required the applicant to present his application to the local land office and after advertising the same for ninety days the survey would be made upon the certificate of the register of the United States Land Office certifying that there was no adverse claim, &c.

The act of May 10, 1872, changed this and required the survey to be made first by the United States surveyor-general, and the advertisement to follow.

There are many valid claims in California of a greater length than 3,000 feet yet to be surveyed and patented. Patents have been issued in this State to claims of 5,000 feet in length with surface ground claimed for milling purposes several hundred acres in extent.

There is nothing in the mining law compelling the owner of a mine to have it patented.

Many of the locations under the present instructions, rules, and regulations will be found defective. In many cases the record of location is lost and an affidavit of some person or persons becomes the basis of the survey.

Under the act of 1872 many surveys are made overlapping each other, producing confusion and endless litigation.

Many claims after being surveyed and advertised are not paid for by the owners, as they either do not have the money or want to use it.

The Commissioner of the General Land Office during the past eight or ten years has promulgated many rulings and decisions, which under the law he is authorized to do, hence it is more difficult to obtain a patent now than formerly. For example, the connecting line at first was several miles in length if the mine was on surveyed land, the Commissioner then fixed the limit at two miles and subsequently at one mile, hence a large number of mines surveyed in 1873, '74, and '75 are now coming back with instructions to the surveyor-general to require the survey of the connecting line to be made to conform with the present instructions. This is done at the expense of the claimant and has caused a great deal of bad feeling, as the miners claim they complied with the law at the time the survey was made.

Another cause of complaint is with reference to the office-work. In 1872 the office-work in the surveyor-general's office was fixed at $30 per claim, it is now $45 per claim of 1,500 feet in length by 600 in width; this includes $5 under the head of stationery. Mine owners say this charge is exorbitant, that the United States might as well include a charge for rent of office. The examination of the reports of the surveyor-general for Utah shows that the office-work charged in that Territory is $25 per claim. In the State of Nevada it is $30 per claim. In Colorado it is $16 per claim. Hence there should be a uniform price charged as the work should be similar in each office of United States surveyor-general.

In the matter of the United States deputy mineral surveyors there is not sufficient care exercised in the appointment of these officers, many of them being unreliable. The law at present requires the applicant to swear to all his papers within the land district. This has occasioned much inconvenience and unnecessary expense in compelling mine owners residing in San Francisco to visit distant points to comply with this requirement. An affidavit made before any officer legally authorized to administer oaths should be received in any land office. For example, it is required of the claimant in a mill-site to swear to the non-mineral character of the land. Living in San Francisco and perhaps never having visited the locality he is unable to comply with the law. So with reference to the proof of posting the notice on a mine during the sixty days' publication, it must be made by one of the claimants.

As a large portion of the mines are owned in San Francisco by capitalists and bankers it is hard on them to comply with this requirement, as they cannot leave their business and watch the posted notice during the publication of the application for patent.

The United States mining laws should be amended in many particulars. The local laws, rules, and regulations of miners should be done away with. A party wishing to locate a mine should apply to the United States surveyor-general and have him make a survey of his claim, establishing the corners. If upon surveyed land, the surveyor-general should plat it in its proper place on the township plat, and the land embraced in the location should be held in reserve until it could be advertised and sold. After survey no second survey should include any part of said mine so surveyed and approved. The length and breadth of mining claims as fixed by the act of May 10, 1872, should be continued. A person can locate and own a number of these claims if he so desires.

With reference to side lines, the law should permit the owner of a ledge or lode to follow it, even if it passes outside his side lines. When the mine owner pays for the land he should be credited with the amount paid for office work as shown by his subtreasurer's receipt. A time should be fixed within which payment should be made for land embraced in a mining survey. Six months after the expiration of the published notice would be a reasonable limit within which to make payment. The registers and receivers should be competent and qualified to examine the papers filed, and should not be permitted to send up defective cases to the Commissioner of the General Land Office and make the latter officer perform the duties devolving upon them. They should be required to send up a statement with each case, and not send up a case unless on appeal without every paper and date had been supplied.

The department should fix a time within which a patent should be issued after it reaches the General Land Office, say not to exceed one year. As it is now, cases are sent up badly and improperly prepared by incompetent persons, requiring the department to do the work the owners have paid some attorney to do, thereby causing delays in the issuance of patents. Furthermore, deputy United States mineral surveyors should be prohibited from preparing applications for patent or any other paper, excepting the field-notes of their surveys.

The law with reference to registers and receivers should be amended so that in the event of a vacancy in either of the offices the other officer should perform the duties of both offices until the vacancy is filled.

The Commissioner should designate one paper in each land district within which all applications for patent should be advertised, and should establish the rate to be charged for publishing the notice.

SPANISH RANCHES.

Judge J. W. North, in his testimony before your Commission, says "that not more than half of the Spanish ranches have been surveyed." He is mistaken. Seven-eighths of them have been surveyed and patented, and one-half of the remaining eighth have been surveyed and are pending before the Commissioner of the General Land Office and Secretary of the Interior.

Some of these surveys have been made many years and have been pigeon-holed in the Commissioner's office for a number of years; for example, the "San Vincente y Santa Monica" "Los Palos Verdes," both in Los Angeles County; "City Lands of Monterey," "Mission La Purrisima," "Pueblo of San José," "Pueblo of San Francisco," and "Agua Caliente."

Mr. Madden, of the Southern Pacific Railroad Company, also refers to Spanish ranches, and says they ought to be surveyed at the expense of the United States and the cost taxed against the grant. This is now the law, and there is money appropriated by Congress to make these surveys whenever there are any to be surveyed. This work is not behind in the surveyor general's office in this State.

PUBLIC SURVEYS.

The present rectangular system of surveys cannot be improved, and should be continued. The rates for public surveys now paid are ample and sufficient to do good work and leave a profit to the contractor. The contract system should be abolished entirely and the deputies should be paid a salary. They should be men of ability and integrity.

IRRIGATION.

This question should be left entirely to the State.

J. A. ROBINSON.

SAN FRANCISCO, CAL., *October* 13, 1879.

Testimony of L. L. Robinson, San Francisco, Cal.

L. L. ROBINSON, of San Francisco, testified, October 14:

I have lived in the State twenty-five years, and have had a great deal of experience in all matters connected with lands, mining, &c.

Question. Would you recommend any change in the system of disposing of arable lands?—Answer. No; I don't think I would.

Q. Do you recognize what we call timber lands? To what extent are they being destroyed?—A. I am familiar with the timber lands, and they are being wastefully destroyed. The waste of timber is dreadful. The chief source of destruction is by irresponsible parties going in and cutting the finest trees they can find for the purpose of making a few shakes, and of course the balance of the tree is left to decay. This is one of the causes of destruction; another one is the carelessness of sheep herders and cattle men. They are very careless about their fires, and when they leave them unextinguished they catch to the timber and burn up the forests. Another cause is, there is no ownership in the land. Everybody comes in and gets it and cuts it down to suit his own purpose. A man will come in and start a saw-mill, and having no capital to carry it on, he will have to cut down the best kind of timber, which is never used. The destruction of timber is fearful, and if it is continued I think the most disastrous results will follow to this State. My idea is that the proper remedy is either to put the timber into private ownership, or else establish a supervision under very rigid laws, which should be enforced. I would establish foresters or establish some department that should exercise strict supervision and control over the timber. I do not care how it is done; but somebody should have control of it as long as the ownership is under the government. Have it supervised or guarded. I should prefer that it should pass into the hands of individuals, because then they would take care of it themselves. It is not practicable to hold this land with small ownerships; but I am inclined to think that it is desirable to sell these lands into one-hundred-and-sixty-acre tracts. I think the timber lands should be sold with reference to location and its abundance, particularly in the mountain regions, where men can only get to the wood by the construction of roads, because it is very broken country. A man may take up 160 acres of timber land, but he cannot get to it. I would suggest that they be surveyed with reference to the topography of the country.

Q. What about the mineral interests in this country? If you allowed large tracts to be taken up for timber purposes, would people not in that way obtain control of

large mineral tracts?—A. I would separate the two rights. I would never have a mineral right interfere with the surface right. I think the subterranean rights should be reserved, because the mineral interest is one of the most important. It would be unwise to give title to the center of the earth to the agriculturist or to a man who would cut the timber. How that system is to be carried out I am not prepared to state, unless it is done by the old Spanish and Mexican method. Any man should be enabled to go and "denounce" a mineral claim on another man's land if he paid for the damage he did.

Q. What are your views in regard to the irrigable lands?—A. I am not entirely familiar with the question. There are several portions of the State of California in which little or nothing can be raised except by irrigation. It certainly cannot be depended upon except by irrigation. Mojave Desert is certainly valueless for agricultural purposes except by irrigation. Take the Tulare Valley; it would be almost valueless except that it can be irrigated. Take the west side of the San Joaquin from the foot of Tehatchepi Pass down for miles; the raising of crops is very uncertain except by irrigation. The question of water right comes in and demands immediate attention, and as soon as some proper law is adopted a great deal of litigation will cease. The irrigation question is one that requires a most careful study. I think in some cases the water and land should go together; but again there are other cases where the control of the water would give a man absolute control over a large body of land. The difficulty with the water rights is that the amount of water necessary for irrigation purposes is always taken out higher up than the land, and may be forty or fifty miles from the land it is destined to irrigate. I do not know of any system of government laws that will regulate that.

Q. Here is an area of land to which the water can be taken. Should the utilization of the water to that land secure the right to its exclusive use, and should the water right "float," thus enabling the owner to take the water wherever he pleases?—A. I am connected with the Riverside Irrigating Company. They have spent much money for irrigating ditches and are continuing that system to a large extent, and they use the water only in connection with the soil for irrigating purposes, and the water is always to be used for that purpose. To some extent the old riparian rights must fail here. I know many instances where riparian rights are owned where the land is totally valueless. If that water was diverted it would make good agricultural lands. I think that water should attach to the irrigable lands. Our irrigation laws have not as yet been well adjusted; the system is inchoate to a great extent.

Q. Can, in general, small irrigable tracts be utilized by individuals?—A. Not judiciously, except in special instances. As a rule, in the country where it is necessary to irrigate lands they have to be located in a body sufficient to justify the parties in constructing irrigating ditches, reservoirs, &c. Agriculture by irrigation is not, as a rule, available to small owners of land. The body of land to be irrigated must be large. It requires a large capital to construct the ditches, and after they have been constructed and the land irrigated, then it is divided up into small tracts to individual owners. Large owners cannot farm to any advantage; they must dispose of the land. The land is eventually certain of being divided and passing into the hands of individual owners. That is the object of these irrigating companies. They purchase the land for $1.25 per acre, and after the water is put upon it it will bring a much higher price. This justifies men in taking hold of it, but it eventually passes into the hands of small owners. At least I don't think the Government can properly carry on these irrigation schemes. The corporation system is the only one, in my opinion, that will be successful.

Q. What have you to say about the pasturage lands?—A. There are three classes of pasturage lands in this country. One is the mountain pasturage, another one is the lands in the great valleys that are not fit for agricultural purposes, and the third class of the pasturage lands is upon the tules. The tule lands are generally in private ownership. The dry pasturage lands in these arid valleys are not irrigated, and probably never will be, for they cannot be reclaimed in small tracts—anybody who takes up 160 acres will starve on them—and they cannot be bought in large tracts; and yet it must be held in large tracts in order to justify the keeping of stock upon it. The mountain pasturage lands are open to every one who sees fit to drive stock into them. They are pasturage lands only in the summer season; these mountain pasturage lands are also timber lands. The foot-hill lands, which extend as high as twenty-five hundred feet above tide-water, contain a good deal of early pasturage; but as the season advances, and water fails in the streams and the springs dry up, the stock is forced higher up, where they stay the balance of the season, until the snow drives them out.

Q. What do you think of the propriety of reserving these foot-hills as mineral lands?—A. I think they should be disposed of in 160-acre tracts; that is, if the government proposes to foster the mining industry at all. A great deal of the foot-hills may become very valuable for raising fruits and vines and some grain. They are being occupied more and more every year, and I think a great many people obtain a sort of quasi title without getting a government title. I would separate the surface

and mineral rights. If a man has been damaged by the operations of a prospector, he should be remunerated, but our local laws can regulate that. The prospector is not a farmer, nor does the farmer want to prospect. The interests are distinct for that reason, though they are closely combined.

In the lands of the Sierra Nevada are found the most valuable quartz mines we have. Hardly any quartz mine in the State will run above an elevation of 3,000 feet. I am speaking of the west slope of the Sierra Nevadas. My method for correcting the evil would be to sell the land as agricultural land, reserving the right to the mines. Ten acres of land may hold untold millions, and, as the mining here is in its infancy, parties, even in agricultural operations, may develop quartz lodes or mineral lodes of very great value. Where a prospector might hunt for months the greenest might strike a mine. I would reserve the mineral land for mining uses and purposes.

Q. How much of these pasturage lands is necessary for a homestead?—A. I do not think any given rule will apply, because it depends upon what part of the State the land is in. In some portions of the State a man will get along with a small tract of pasturage land, but in other portions he will want many thousands of acres. I know quite a large tract of land where as sheep and cattle eat up the food in the upper valley they keep moving down toward tide-water to get grass. All cattle and sheep must have water; but you cannot always get it. Even a system of artesian wells will not supply eighteen or twenty thousand sheep.

Q. Does grass deteriorate under pasturing, and will it not finally be destroyed?—A. No, sir; that has not been my observation. The grasses are perennial. If the cattle are put upon the land when it is not muddy I think the grass will always come up. Of course it depends upon the seasons. I do not think, as a general rule, the grass will all die out finally. It is worse on the eastern side of the Sierra Nevadas than it is here.

Q. Have you thought of dividing these pasturage lands into farms in such manner as to secure the greatest number of water fronts to the pasturage farms?—A. No, I have not. I think at the present time it is scarcely possible to do that, because the best water has been taken up. The Spanish grants, whose exterior boundaries run to the boundary line of the State, have taken up all the water that is desirable for stock purposes. Most of these lands, however, are subdivided and are now passing into small ownerships.

Q. Have you any suggestions to make concerning the Spanish grants?—A. There are very few grant cases now undetermined in the State. Almost all of them have been surveyed; indeed, I do not think I have ever known a set of men worse treated than the Spanish ranchmen. With reference to the surveys, I think the surveys of California, as a general rule, are very far from being correct. I think there has been great carelessness displayed, and I think there are very few surveys that will bear close inspection in the State of California. Whether it is owing to the mode in which the lands have been surveyed by contract, or from carelessness, I cannot say. Nor do I know of a better mode; but I would recommend the employment of a better class of men. It is my opinion that the contract system is one which tends to secure very poor work. I think the day system, under conscientious surveyors, would be preferable. It would conduce to more accurate work. I have been connected with hydraulic mining for fourteen years. There has been a great deal said with reference to the value of farming land injured by the *débris*, and the value of the mines causing the injury, and I think some testimony has been given here concerning this point.

Q. I understood, Mr. Robinson, that you are familiar with hydraulic mining. Will you give us in your own way a statement concerning hydraulic mining and its effects generally upon the agricultural lands?—A. As to the relative value of farming lands injured by *débris* from the gravel mines compared with the value of the mines, I desire to state it is a very small percentage. The *debris* (so called) from the gravel mines alone is not as injurious to farming land as is the case with the tailings from quartz mines and mills, which are poured in large quantities from these sources into the rivers, as the quartz does not decompose, whereas the material held in suspense in the rivers from the gravel washing, after it is deposited on the land in the main valleys, will in a few years make excellent arable land. The industry of hydraulic mining or, as it might properly be called, gravel mining, is a very large and important one in the following counties: Stanislaus, Tuolumne, Calaveras, Amador, El Dorado, Placer, Nevada, Sierra, Plumas, Butte, Yuba, Shasta, Siskiyou, Del Norte, Trinity, and Klamath. In these counties, and connected directly or indirectly with gravel mining in various ways, at least $100,000,000 has been invested.

The most important branch of gravel mining is done by what is known as the hydraulic process. I am personally interested in two mines of this kind, and have been for the past fourteen years. In these two mines, the North Bloomfield and Milton, situated in Nevada County, about $4,000,000 was invested, taking over ten years to get them in complete working operations. In connection with these two mines we have driven, through hard rock, over four miles of tunnel to reach the gravel, the largest single tunnel being nearly two miles in length, constructed at a cost of nearly $600,000. One of these mines, the North Bloomfield, is supplied with about 3,000

miner's inches, or 55,000,000 gallons of water per day of twenty-four hours the year through. The miner's inch of water is 2,230 cubic feet, that will flow in a day of twenty-four hours. This is regulated by an opening an inch square, with a pressure above the opening of six inches. We settled that two years ago by a large series of experiments. The water is brought from a reservoir in the high Sierra Nevadas, 45 miles, through a canal across a most difficult country, at a cost of over a half million of dollars. This reservoir, which consists of two stone dams, one of which is nearly 100 feet high, having a storage of 1,000,000,000 cubic feet of water, was constructed at a cost of $250,000. The other mine, called the Milton, is supplied with about 50,000,000 gallons of water per day, brought 75 miles over a very rough section of mountain country from a reservoir near the summit of the Sierras. This reservoir, which is formed by three stone dams, one of which is among the highest in the world, being nearly 150 feet in height, will hold 900,000,000 cubic feet of water. In the mines of these two companies alone there is used yearly about 1,750,000 miner's inches of water. Each inch of water is equivalent to 2,230 cubic feet. The amount of gravel moved per year by this quantity of water, used as we use it, under a pressure varying from 275 to 400 feet, through nozzles varying from 6 to 9 inches in diameter, against gravel banks varying from 50 to 400 feet in height, will amount to about 5,000,000 cubic yards, and the gross yield of gold is about $1,000,000 per year, averaging about 20 cents per cubic yard, or 55 to 60 cents per inch of water used. The yield of gold from the gravel mines of this State is about $12,000,000 yearly, averaging about $1,000,000 per month. This yield will continue for the next forty or fifty years to come from this source alone. I do not think it will increase materially, from the fact that the water supply is limited. Nor do I think that the mining machinery and appliances employed at present can be materially enlarged or increased with economy in results. The machinery and appliances connected with this class of mining has about reached its maximum.

On the western slope of the Sierras there are some eight or ten counties where gravel mining is the principal industry. The number of such mines, including hydraulic, drift, placer, and river, is very great. At least 100,000 persons derive their support, directly and indirectly, from this kind of mining. To stop it would depopulate nine or ten of our most prosperous counties, ruin a large proportion of our State population, and load down the balance of the State with taxes which they would be unable to bear, and would be most disastrous in all ways.

The damage to the lower rivers, bays, and harbor, caused by gravel mining, has been very much exaggerated. Much the largest portion of the material filling our harbor comes from the operations of the farmers and other causes, and not from the operations of the miners at all. The mining rivers, as they are called, from the gravel mines to their debouchment into the plains, have been filled up to a great extent by the operations of the miners, both gravel and quartz; but even this filling is aided by natural causes. As to the damage caused to the lower rivers, bays, and harbor, by filling, the acts and doings of the farmers and others contribute 15 cubic yards or more where the miners contribute one. In our light soils, upon land at all rolling or inclined and not absolutely level, the constant yearly degradation is very great. And when it is remembered that the area draining into our lower bays and harbors covers nearly 60,000 square miles, it is not to be wondered at that a large amount of material is constantly being poured into them. The general impression is that all the vast amount of material deposited in our lower rivers and bays is from the hydraulic mines, when the fact is that their operations have but a very slight effect upon this filling.

In early times in California, before the country was occupied by the Americans, the population was quite limited and scattered. The land was held in large tracts, and was only used for grazing. Our present system of cultivation was unknown, and the surface of the ground was rarely or never broken up by the plow of the farmer. It was protected from washing by the grass roots, and the amount of material washed into the rivers was very limited in quantity; so much so that very little of it ever reached the harbor. Since farming has been carried on by our people upon its present large and increasing scale and area, the yearly increase in the amount of material pouring into the rivers and bays has steadily and rapidly increased, until it has attained such vast proportions as to cause great fears for the future. During the winter months the streams running into the bays and lower rivers are thick with mud. I should say that the degradation of the surface of the country occupied solely by the farmer has been increased, since farming was first commenced in California, say since 1850, from ten to fifty times, depending upon soil and locality. Other causes are also tending to shoal our harbor and its entrance. The most important, perhaps, of these causes are the sewerage and waste from our city and the operations of the railroad company on the Oakland shore. This work is perhaps as injurious, if not more so, than any other single cause, for they are not only depositing a very large quantity of new material in the bay, but it is done in such a direction and manner as to cause the rapid shoaling of a large area of San Francisco Bay, diminishing its tidal area, with a consequent injury to our harbor.

These grave results, which appear to be inevitable, are certainly not caused by the

miners, for their contribution is but a very small percentage of the injury from all other sources. We can measure with much certainty the results of mining operations, and particularly so with hydraulic mining, as in this class of mining our knowledge is derived from close observation and experience. There is used per year in hydraulic mining not exceeding 10,000,000 miner's inches of water (each inch representing 2,230 cubic feet). This quantity of water used under the hydraulic system of mining will move not exceeding 30,000,000 cubic yards of gravel. Of this amount at least 95 per cent. is lodged in the cañons at or near the outlet of the mines. The remainder finds its way into the lower portion of the running rivers, filling them gradually, until by the time it reaches the lower rivers and bays but very little is left. This material is not injurious to any land, on the contrary it is as fertile as the silt or deposit from the Nile or any other alluvial river.

Much the largest portion of the damage committed in proximity to the mining rivers between their outlets at the mouth of the cañons and the main Sacramento River (which has been very much exaggerated) is due to mining upon these rivers and their tributaries long before hydraulic mining was in operation upon a large scale. The placer mines were innumerable, and the amount of material of comparatively light nature moved by the vast number of individual miners engaged in this class of mining was very great indeed. The material was of such a character that it flowed quite readily down the tributaries into the main cañons toward the plains, where a larger portion of it remained until a stormy winter like 1862 came, when the cañons were swept clean to the bed-rock, and the *débris* was poured into the lower portion of these rivers, filling them up. Since hydraulic mining has attained its present magnitude the material moved is of a much heavier character, and does not pass down the cañons to the plains with the same facility as the lighter material moved from the placer mines. The heavy material moved by the hydraulic process lodges in proximity to the outlets of the mines, fills up the main cañons where it becomes impacted, widens out the beds of these rivers preventing the winter rains from washing it out rapidly by causing the water to spread over a greater area, and impairing its force and power to move the material. In many places these cañons are filled to a depth of one hundred feet or more, and the surface of the river is in consequence widened to several times its normal width. The material thus deposited and impacted will not move down the cañons unless mining ceases. If mining continues as at present, these vast cañons will be constantly filling in the mountains until their beds are raised up to a level with the mining outlets, and as each year fills them more and more the surface of the river-bed becomes wider, while the power of the water to move the material down the cañon will steadily decrease. The miners are now investigating the question of the construction of a series of brush or tree dams in the cañons to aid in retaining both the old and new *débris* in proximity to where it is first lodged. The miners are, in fact, duplicating the filling of the old rivers from whence they are now moving the material with which they are filled to extract the precious metal contained therein.

Should mining now cease, all the material at present in these cañons (and the quantity is very large indeed) will certainly work down with the water upon the land below the mouths of the cañons on the plains, and so continue for many years to come, to temporarily damage the lands in proximity to and along the course of these rivers after they have debouched from the mountains.

There is but little doubt as to the feasibility of retaining the material at present in the cañons in place, as well as to retain a very large per cent. of any new material which may be poured into them from the mines. Nor is there much doubt but that the balance of the material which will be held in suspense in the water can be utilized on the low lands (now valueless) in the main valley below, as well as upon the foot-hill lands in the way of irrigation, by distributing the muddy water over them as is now done to quite an extent in Yuba County successfully.

The impounding of such large bodies of water as is contained in the reservoirs of the hydraulic mines has a beneficial effect in two ways; it prevents it from coming down in winter season, thus diminishing the destructive power of these rivers in rainy season and stores it for summer use (when there is very little water in the rivers) for mining and irrigation, equalizing, to a certain extent, the flow of water during the year. The mining reservoirs, costing from $50,000 to $250,000 each, already constructed for hydraulic purposes, can store at least 10,000,000,000 cubic feet of water, which is utilized during the summer or dry season through long lines of canals or ditches, constructed at a cost of from $5,000 to $10,000 per mile. The amount of money expended in construction of these reservoirs and canals exceeds $20,000,000. In the future, when the gravel mines which these works were constructed to supply are exhausted, they will serve to irrigate all the lower slopes of the Sierras for cultivation. No possible system of agriculture could afford to construct such an extensive and expensive system of irrigating works, and although the miners may in their operations for a few years commit some temporary injury upon a limited quantity of farming lands below them, yet the great benefits which such a vast water system will confer upon the million acres on the lower portion of the western slope of the mountain in the facil-

ity and cheapness of irrigation after the mines are exhausted will compensate our State many times over for all the temporary damage now being committed.

It is estimated by competent authority that there is yet remaining of known gravel between the South and Middle Yuba Rivers alone about 700,000,000 cubic yards of gravel, which will be mined out by hydraulic process, besides a large amount which will be mined out by drifting. It is safe to estimate that this gravel will yield from $150,000,000 to $200,000,000, and the principal part of it will be mined out during the next thirty or forty years. The gravel mines are situated on and along the mining rivers, at distances varying from 10 to 70 miles from their outlets in the plains, and they will all be exhausted long before these river canons will be filled to a level with the outlet from the mines. The gravel channels, where hydraulic mining can be carried on profitably, are well known and can be measured and estimated with considerable accuracy; but the drifting mines in gravel are as yet scarcely known, and this latter class of mining as well as quartz mining (requiring but little water) will continue long after the former class of mining has ceased entirely. The vast gravel deposits where hydraulic mining is carried on cannot be worked in any other way; and there is, in my opinion, no doubt whatever but that the interests of the miners and the comparatively small number of farmers and others in the valley injured by mining operations can be harmonized by proper legislation, guided by intelligence and a desire to arrive at results, but it can never be done by litigation guided by those whose interest is subserved by fostering such a course. The interests at stake are of too momentous and important a nature, and the number of persons whose all is invested in mines and whose support depends solely upon mining industry is too great to be interfered with and destroyed by litigation.

The net profits derived from hydraulic mining are not at all excessive, when the risk, length of time necessary to develop a mine, and the amount of money involved and expended, are taken into account. The North Bloomfield Gravel Mining Company was over ten years in opening its mine, and before any net returns were received expended over $3,000,000. The Milton Water and Mining Company was many years in opening its mine, and expended some $2,500,000 before any net return was received by it. Upon such ventures a larger percentage is justifiable than would be the case in any other industry; indeed it is believed that none other than a mining community like California would undertake such a risk requiring so much capital and time. Yet it is believed that none of this class of mines pay over twenty per cent. per year as an average upon the capital invested, with interest, and nothing but the permanence of such a mine as those above mentioned would justify the risk and expenditure in any community. Many first-class hydraulic mines promise more than 20 per cent. but pay less. There is a great number of second-class mines of this kind, running during rainy season only, which pay their workmen good wages, with but little profit to the owners, and still a larger number of fourth-class, which barely pay their workmen and embarrass their owners. Yet they all find employment for a large number of persons and support for their families.

The gravel miners have gone forward with their enormous works, in the shape of reservoirs, canals, tunnels, and other works, such as have never been equalled in any other portion of the world, under the full cognizance of the United States and State governments, indorsed by the customs and usages of the community, and by the decions of the courts, and have expended over $100,000,000 in purchasing their claims from the government and in developing them, creating a property estimated at $250,000,000 or more in value, and claim that they have acquired by their acts and doings vested rights which cannot, at this late day, be taken from them. Hydraulic mining cannot, as a general rule, be carried on with profit on a small scale. It requires a large body of ground to justify the expenditure necessary to open a mine, bring water to, and work it. Hence the necessity of large capital and consolidation of the smaller claims, which were originally taken up under the mining laws of the United States long ere this kind of mining was introduced.

It will be a very serious matter, not only to California, but to the nation at large, if mining is stopped upon this coast on account of the injury committed upon a limited and comparatively small body of farming land and a very limited number of people occupying the same. The value of all the land already damaged, or which ever will be damaged, is certainly not one per cent. of the amount of gold extracted from the mines committing the damage, and the number of people injured financially from these mining operations does not exceed five per cent. of the number which would be injured irreparably if mining was stopped.

Our rivers in the great valley of California are extremely alluvial in proportion to their length, and are becoming more so yearly, owing to the physical conformation of our State, the close proximity of the lofty and abrupt mountain ranges, as well as the character of our soils, and the long dry season, followed by a heavy rainy season, and the operations of the farming and mining population. The material brought down by these rivers, highly charged as they are with alluvium, would, if utilized, make the valley of the Sacramento and San Joaquin the most productive portion of our con-

tinent, and the time is not very far removed when our people will seek to utilize the alluvium instead of finding fault with it, as there are thousands of acres, now valueless, which would become the choicest of agricultural lands if the material held in suspense in our rivers from the farms and mines was utilized, instead of doing injury to our bays and harbors.

I beg to attach hereto a map, compiled by Mr. P. Huerne, architect and engineer of the section of mining country between the South and Middle Yuba Rivers, in Nevada County, in this State, and in proximity thereto. This map exhibits, with much accuracy, the general course of the known gravel channels, also the principal rivers and mining claims, as well as the location of several mining reservoirs, and the ditches or canals connecting them with the mines; and shows also the general lay of this section of our State, where are located the largest and most important gravel mines of the world.

I want to add a word more about the swamp lands. I used to have a good deal of controversy with gentlemen about the segregation of swamp lands, and what were swamp lands and what were not. There is still needed some legislation to modify the law of 1850, which was made for Arkansas, because the adjudication of the swamp-land question here requires a consideration of different seasons of the year and the difference in climate in different years as regards the water. In one case that was tried before me up at Knight's Landing, in which Mr. Redding here was counsel for the railroad, and in which there was a provision made for irrigating swamp lands in wet and dry seasons, I asked a man whether he would take this land on lease for ten years and take it without any artificial means, without dikes, levees, &c., but just as it was and cultivate it, and he said he would not take it. "Why not?" I asked. "Because," said he, "I would be drowned out seven years out of the ten and burned out the other three." The three years in which he would be burned out would be because the sediment of blue clay would be impenetrable to the plow.

Then, again, I have seen lands not protected by levees where a crop had been raised for two years together, and when I was on the land I saw the remains of wheat stubble which had produced fifty or sixty bushels to the acre, but where I saw it I was walking in tules over my head. This shows the difference in the land at different seasons, and you see how it is possible for a deputy surveyor to come in one season and say it is dry land, while another season he might be up to his neck in water. And, then, there is a difference in the lands upon the mountains, which are swamp lands in one sense, but which the water does not injure, but rather improves. They are swamp lands in one sense, but, then, they are really swamp lands. You can't drive a wagon over them but at a particular season, and still they are profitable lands.

Testimony of W. R. Robinson, farmer, Tulare County, California.

HANFORD, TULARE COUNTY, CALIFORNIA,
October 4, 1879.

To the Public Land Commission, Washington, D. C.:

GENTLEMEN: Seeing a request from you in the agricultural public press of this State asking for answers to questions you have put forward, and being anxious to see what I consider some defects in the land laws and attendant subjects altered, I have tried to give a short reply, which I should have given at greater length but I am very pressed for time. However, if any of my suggestions are of use to you, and should you wish to know more on any of the subjects, I will gladly answer your further interrogations and do my best to further the objects you have in view.

I remain, yours respectfully,

W. R. ROBINSON.

Answers to preliminary questions.

1. I, W. R. Robinson, of Hanford, Tulare County, California, am a farmer, in joint partnership with J. S. Robinson, and of the firm of W. & J. Robinson.
2. I have lived nearly five years in Tulare County, and seven years in the State of California, living formerly partly in San Francisco and partly in Mendocino County of this State. Am an Englishman by birth; came to the United States in 1872; was a student of the Royal Agricultural College, Cirencester, England.
3. Never.
4. By observation and study.
6. I treat this question under question 27 of agriculture, latter part.
7. They are so varied that I cannot do justice to the subject for want of time. The most of the public lands now left are mountainous and timber-clad.
8. I have no means of examining the act of Congress referred to; I shall try to treat the questions of land and classifications in answering your several questions.

9. I think it advisable to allow any one the right to buy 160 acres of land irrespective of the fact that he has pre-empted or not, because I find there are many men who have pre-empted land and they have adjoining them a piece of land that is valuable to them, as lying adjoining their property, but useless to any one else either from the want of a spring of water, or incapacity, owing to rock, to sink a well. Thus land is held unpaid for, untaxed, and unoccupied by settler, and practically owned by the proprietor of adjoining deeded land. At other times by arrangement some man will acquire a title to such land only to redeed it to the first party above named This system is morally wrong and necessitates false swearing, seldom detected and punished; while the right to buy such land not to exceed 160 acres would generally be availed of in these cases.

AGRICULTURE.

1. (1.) The climate of this locality, the "Muscle Slough district," situated in Tulare County, California, is warm, naturally dry, and healthy.

(2.) Rainfall uncertain and deficient, averaging about 3 inches per year; often not more than 1 to 1½ inches, and up to as many as 6 and 8 inches, in what may be called good years in this locality.

(3.) Winter or wet season begins about November 15, to March 15 of each year, the rest being rainless.

(4.) Snowfall none, but frost prevalent during winter.

(5.) Supply of water for irrigation uncertain, owing to existing circumstances which I shall deal with under Question 8.

2. (1.) First part already answered under Question 1.

(2.) According to the season; if warm weather in the mountains sets in early, water comes down in sufficient quantities in the spring to supply every one moderately, but the bulk of supply comes generally too late for early grain.

3. Without irrigation, directly or indirectly, except in exceptional years, none of these lands will pay to cultivate.

4. With irrigation the whole, more or less, according to the prevalence of alkaline properties, which kill all vegetation where they are too concentrated.

5. Crops raised are varied; principally wheat; also alfalfa (Luzerne), beans, maize, Egyptian corn, pumpkins, melons, garden vegetation, and anything it pays to raise. The soil is susceptible of raising everything, but the discrimination in freights and the wretched prevalent laws regarding irrigation and water rights has crippled the district to a great extent. Five years ago people here raised castor beans, got a good crop, and could have made money at it, but the Southern Pacific Railroad, who carry wheat at $60 per car, levied a rate of $300 per car, same weight, as freight for castor beans and broom-corn, both of which we can grow to perfection, and both of which require a great deal of labor, giving employment to men and boys at remunerative rates; but existing freights are prohibitive, and neither crop is now raised. Fruit can be raised of any kind, but market is poor and local demand very small. These rates are suicidal to the railroad company, since it enjoys a monopoly of the carrying trade, because either of the two last named crops can be grown after the wheat each year has been removed, and thus they would get freight to carry which they have not now. Such is the art of discrimination in freights as allowed and practiced in these States, where the Central Pacific Railroad and Southern Pacific Railroad (both one company) reign supreme. Roots of any kind can be grown here.

6. If the land is dry and has never been watered before, a stream of water that will go through a headgate 1 foot by 1 foot under, say, a 4-inch pressure, will wet 160 acres in four months, provided the neighboring quarter sections are being wetted also at the same time. Second year, water sufficient to keep the ditches full that are on the land will suffice—say one-quarter the quantity.

7. A part of this district is watered by water from the Kaweah River, through one of its channels known as "Cross Creek," which bounds the district on the east, but the bulk of the land is watered by King's River.

8. Under question I, section 5, I mentioned that the supply of water for irrigation was uncertain, and for the following reasons: First, because nature's supply is not always the same, but principally because of State laws on irrigation are conflicting, intricate, and undecisive. A short history of the several canals (irrigating) that take out of King's River will be necessary to convey my meaning. As long ago as twenty years one J. Morrow took out a small ditch direct from King's River to irrigate his lands on the margin of the same, carrying, say, 8 feet of water. Two or three others followed his example in the same small way. Then a man named Church took out a larger ditch and appropriated an old slough to convey it a large part of the way; he appropriated 44 feet. Then, about 20 miles below him, on the opposite side of the river, a company (known as Lower King's River Company) of about 70 men took out what may be called a canal to carry 100 feet, which it duly appropriated. Then 100 men formed a similar company on this the same side, known as the People's Ditch Company of King's River, took out a canal, and duly appropriated 100 feet. Then a

company, known as "The Last Chance Company," did the same, likewise appropriating 100 feet. Then a company, known as the "Emigrant Ditch Company," appropriated 100 feet of water. These larger canals made Church's canal small by comparison and gave him larger ideas. He then took out a charter for 3,000 feet and enlarged his canal, and carries now, when full, 1,500 feet. Another company who helped him have taken out a canal of, say, 200 feet. Now, both the last companies take out higher up the river than any of the four above named (viz, Lower King's River Ditch Company People's Ditch Company of King's River, Last Chance Ditch Company, and Emigrant Ditch Company), and, when water is low, which it is from July to February, they, by maintaining a dam each and by the superior grade that the fall of the country allows their canals to have, do take nearly all the water in the river, so that the four companies, who really have prior rights by appropriation, are dry while they are full.

Church, the proprietor of the 3,000-foot canal, is a scheming man, who does not work, while the owners in the four canals above named, about 350 men, are ordinary farmers, working with their hands each day, and have no money to keep attorneys continually under their pay watching the transactions of legislature regarding irrigation; and thus, by complying strictly with the requirements of law, Church has been able to stand off all endeavors, where those defrauded have sought redress through the courts to obtain the water which by actual appropriation they have a right to. The people are in many cases in favor of a commission authorized by legislature, and would be willing to be governed by their decision after they had fairly investigated the whole; but Church would oppose any such investigation, and those to whom he supplies water would back him, and so matters stand to-day. Those who jointly own, but who are poor, a right to 400 feet of water are now, and are so for seven months in the year, dry, while those who came after them are preferred before them. Our people are in favor of a State control of our water system, but such changes generally give greater taxation and often a chance for some dishonest men, not the choice of the people, to get into power and become enriched by their management, to the detriment of the land-owners. This question (8) has already taken up so much of my time that I must here drop the subject, but if you would wish further information I shall be glad to give you further particulars.

(2) Irrigation has a tendency to bring the alkaline matters in the soil to the top, and often in such quantities as to damage the crops, but this is only in localities where alkali has previously been already predominant but laid dormant in the subsoil or elsewhere.

9. (1) By percolation about 50 per cent., where the canals are new, is wasted in the main and its branches before it is distributed; in after years, less each season until, say, 20 per cent. is reached; this includes evaporation by the sun.

(2) Only such portion is returned to the streams as is not required, and that seldom occurs, as a preferable plan is adopted of not allowing that water to enter the canal when it is not required. There are no restrictions.

10. All the water taken up in this locality was taken up under the mining laws then existing, and the law was complied with to the best of the ability of the appropriators. For rest see Question 8.

11. Please again refer to Question 8.

12. Our lands are adapted to one crop as thoroughly as to another. Any or the whole can be sown to grasses.

13. All the land in these parts herein referred to are taken up, and any family, after the ground is wet, can make a good living off 80 acres; but in the neighboring unirrigated lands which are not *naturally* fitted for irrigation (there is plenty unirrigated that can be irrigated), and in the foot-hills and mountains, less than 640 acres of land cannot support a family; hence it is that so much land still remains in the hands of government in these parts, and always will, being strictly pasturage, and will average one sheep to the acre or one cow to five acres.

14. (1) Not until five years after settlers have been allowed to pre-empt and homestead 640 acres each.

(2) And then each purchaser should be limited to 1,000 acres for at least five years.

15. (1) One steer to the acre on irrigated lands; one steer to five acres on unirrigable lands.

(2) All things being equal in Los Angeles and other parts, both places give equal results.

16. Of cattle of various ages, about 60 head, as 12 to 15 should be marketable each year, giving $35 as value of each on the farm when marketable.

17. Owing to the fact that we are without water in our canals for seven months in the year, and that these cattle are mostly dependent on pumps and windmills, cattle are but little raised here, so I cannot give statistics.

18. With irrigation grass has increased twenty-fold; without irrigation no alteration is perceptible.

19. (1) Generally fence what they have deeds for, and sometimes unsurveyed land also where there is no natural fence.

(2) Yes.

20. Difficult to say, as it depends on the owner.

21. By pumps, and in a few cases by natural ponds, except when there is water in the ditches.

22. Where both are confined to grass only, 1 beef to 10 or 12 sheep; but where brush largely prevails, 1 cow or beef to 5 sheep.

23. According to the management of the owner. If he has allowed sheep to eat the pasture too low and close, and kept it so, the grasses, artificial and natural, die out, especially those wild grasses which must seed each year, and which spring each rainy season from seed and run their lives out each season.

24. Yes, if not fed too close; but if overstocked the sheep will thrive while cattle starve.

25. Cattle men keep sheep men away when they can for the above reason.

26. About 10,000 sheep to 1,000 cattle, or even greater. Cattle seldom herded; sheep in bands from 500 to 3,000 or 4,000.

27. In surveying lands and establishing counties, natural boundaries, such as a river or the summit of a range of mountains or hills, should if possible be the established limits by law. The division between Fresno and Tulare Counties ought to be King's River, whereas it is an arbitrary line, giving the whole of King's River over to each county in different parts of its line. It rises in Tulare, bends and goes into Fresno a mile or so, comes back a mile or so and runs a long way again in Tulare, goes into Fresno again three or four miles, and eventually empties in Tulare. Our people represented the matter through their senator and got the river recognized as the boundary, but interested parties secretly prevailed on the next senator to change it back again, which was done. Again, in our mining districts the county terminates half way down a mountain, and two adjoining claims, for no good reason, are in two different counties, and each claimant has to apply to a different county recorder and clerk, and to different supervisors, for privileges or services according to their necessities. One of the laws of the State is that the supervisors shall have the granting of privilege to take water from rivers in their respective counties. Thus men who took out canals on the Tulare side of King's River had to apply to Fresno board of supervisors. Again, a company applied to the Kern County board of supervisors for a charter to take water from Kern River; but the bulk of water has its rise and drains from Tulare streams. Several farmers have taken the water out of the river up high, where it is in Tulare County, and when the Kern companies complain they are told that that water rising in Tulare and never having been in Kern, the Kern County supervisors have no jurisdiction. Such things should be national law, and not left to every scheming man to arrange through his particular friend in the local legislature.

As I understand the laws of pre-emption, when a man wishes for his deed he must pay to the local agent from $200 to $400 for the government. This is often difficult to do, as the settler generally sees rough and hard times during even his first five years, often and nearly always during the period of pre-emption, when the laws necessarily hamper his actions to a certain extent. Thus he goes to a money loaner, who unfortunately is not unfrequently *indirectly* the local agent himself, who finds the money at high rates, from 12 to 30 per cent. per annum; in return takes a mortgage on the land, and in numerous cases he eventually owns the land if he desires, and the man, thus defrauded indirectly through the rigidity of government demands, is once more turned adrift, with his homestead and timber-claim rights alone left him, and thoroughly disheartened besides. I would suggest partial payments, giving in return a conditional deed stipulating that within five years the whole be paid in or the first and subsequent payments forfeited, the latter condition so as to prevent settlers from throwing the land exhausted in to the hands of government. This gives settlers an opportunity for some little freedom, without danger of forfeiture of title, and an opportunity to be independent of the frontier capitalist.

28. It is often impossible to find corners, because often the stock men pull them up where they wish to keep the range, hitherto unsettled on, for their cattle, hoping thereby to delay settlement, even if only a few months. I would suggest that at least all along the township lines a larger and more durable external monument be erected. The charcoal, when findable, is good enough, but the pegs get smashed by stock, or settlers' wagons, or animals digging, and in various ways. Nearly every settler here has had in his day to pay for the county or other surveyor to resurvey for him.

TIMBER.

1. Along the river banks and in the foot-hills and mountains plenty of timber. In this section the natural timber is oak, sycamore, willows, &c.

2. (1) Principally Lombardy poplar, Carolina poplar, cottonwoods, blue and other gums, catalpa, and numerous others, more or less.

(2) Best are poplars and gums; growth in spring, summer, and early fall.

3. By lease only, returnable in ten years to the government conservator. The forest laws as practiced in Germany and India, varied sufficiently to meet the requirements

of our people, seem to me the best and most just when the claims of future generations are considered. Taking into consideration the struggle which our frontier settlers generally have to make a home, it would be hardly right to enhance the price of lumber by making mill owners pay heavily for the right to cut out the timber in the logging country, but a rental of $5 per acre would not be heavy on any mill man, or $3 where the lumber is such as to fetch but low rates in market. In order to enforce the laws and regulations it would seem that the civil-service system should be followed, because if a man who was elected by the people locally were to enforce the laws he would be objectionable to those whose interests he had to oppose, and they would leave no stone unturned to insure his not being re-elected. In India it is one of the finest departments of the government, and so long as the conservators do their duties they have nothing to fear. In going over those districts in this and other States one is struck with the wasteful way in which timber lands have been left after all the valuable timber has been cut out; large spaces treeless, then several huddled in close proximity to each other.

4. Certainly, if by the word "classify" you mean discrimination as to value of timber growing, whether hard or soft woods, not in manner of disposition or size of tracts, leasing all by the acre, but in price only.

5. Generally an irregular but vigorous growth of the same sorts as those trees that formerly held the ground.

6. Forests catch fire from carelessness of hunters, desire on part of people who are pasturing to burn up old feed so that the coming year the feed may be clean and free from rubbish, desire on part of miners and others to clear underbrush, from fires of campers and Indians, blasting by miners, and carelessness of people generally, often widely extended; very destructive, especially to young trees. Their occurrence can hardly be prevented, but their spread can be controlled by roads kept clear of brush and trees and used to take out the timbers. If the roads are quite straight and at intervals of say five miles apart, which would be necessary under a thorough system of supervision with branch roads also straight, these fires could often be subdued and in many cases die a natural death.

7. Tax every railroad for every tie they buy; they would tax the producer in return, so that the weight would fall on the right shoulders, but the government would be spared the expense of hunting up the right parties. Legislation, I am afraid, would not reach the case, except at great cost. The depredation and waste is notorious, whether it be for railroad ties or building, mining, or agriculture, but it is more or less unavoidable.

8. There are no restrictions practically. The man who fells a tree owns it unless the land be deeded.

9. No; because the land office is not subject to a system of civil service, and if a district land officer did his duty he would not hold his office long. In many cases also they are not tried and trusty men.

Testimony of Joseph Russ.

The questions to which the following answers are given will be found by unfolding page ——.

To the Public Land Commission:

GENTLEMEN: The interrogatories submitted to me by the Commission, although somewhat arduous, I will endeavor to answer to the best of my ability with the data I have at hand.

1. Joseph Russ; Ferndale, Humboldt County, California.

2. I have been in this section about thirty years.

3. I have acquired title to lands chiefly by purchasing from those who held United States patent.

4. By observation.

5. In pre-emption cases where there is no conflict the pre-emptor usually makes his proof as soon as the law will allow him; he then has to wait on the department at Washington for his patent from one to four years, unless he will send his duplicate receipt to some attorney in Washington with $25. In that event it will come in about six or eight months. The ways of the department are certainly mysterious in this particular to most people. Where there is a conflict, and an appeal is taken from the decision of the local land office to the department at Washington, the decision is often deferred so long as to work, if not in effect an abrogation of the rights they may have acquired, certainly great injustice to the parties concerned.

6. The land laws of the United States remind me very much of an eccentric rich

man who is willing to give his poor neighbors a good dinner, provided, however, that they will first swim across a river whose waters are not overly clean to obtain it. In my opinion the land laws should be so amended as to give every citizen who wishes the right to obtain title to 160 acres of land or more in the most direct way possible. Years of observation have forced upon me the conclusion that the present land law has been instrumental in making more men perjure themselves than all the other causes that operate upon men in new countries. In short, however well the intention of the law, it certainly operates as a reward for crime.

7. The public lands in Humboldt County are grazing, mineral, and timber. Little if any agricultural land now belongs to the public domain. We have some small valleys, but the most of the county is rather mountainous and better adapted to grazing than anything else.

8. The several classes of lands can only be ascertained and their character fixed by an actual survey. Nothing short of this would be reliable. I am of the opinion that whenever a United States deputy surveys one or more townships it would be an easy matter for him to determine the character of the land; but in order for the government to get honest work and an honest report, something that can be relied upon, it must first be honest with those they employ. Since the reduction in the price paid by the government for surveying land it is impossible to get an efficient survey without the people paying the deputy extra, because in this mountainous and wood county many townships cost from $400 to $600 more to do the work well than the government pays; but if the government will deal fairly with their deputies, that is, pay them what it is worth to do the work, the information could be reliably obtained so far as concerns those townships that are yet to be surveyed. In regard to those that are already surveyed it seems to me that the county surveyor with some aid could easily give the character of the lands.

9. I think I have answered this interrogatory in 8.

10. As I have heretofore stated it is my opinion that the actual settler ought to be able to obtain title to lands in a more direct way than at present, and indeed it is the opinion of the great majority of men in new countries that the land should be sold to any one who wishes to purchase after it has been held for pre-emptors six months or a year. There is little doubt, however, but what it would be money in the Treasury if 160 acres was given to each actual settler at just the expense of surveying the land, without compelling him to live on it five years. He would certainly do so if it is to his interest; and if it is not, then anything that the government may do to compel him is simply injuring one of her own citizens, consequently herself.

AGRICULTURAL.

1. Our climate on the coast is very even; we have neither extreme heat or extreme cold.

2. Our rainy season commences in October and lasts until May. We have no snow on the coast, but it falls to a considerable depth in the interior. It does not, however, remain long on the ground, except in high altitudes.

3. It is not necessary to irrigate in this county, and has therefore never been resorted to.

12. About one-third of the land in the county is adapted to pasturage, one-sixth farming, and one-half is timber land.

13. It might be practical, but it would require at least 640 acres to insure a family a living, and that too in the best of the grazing section.

14. It is my best judgment that all grazing land should be put in the market for private entry without any limit as to quantity that each individual should purchase.

15. It requires about 8 acres of pasturage land to keep one beef. The grazing land in this section compares favorably with the best in the State, and in fact I am of the opinion that they are the best.

16. From 75 to 100 head of cattle would support a small family, provided the market was good, otherwise it would require a much greater number.

18. The growth of grass in this county has diminished.

19. The cattle ranges are generally fenced in this county.

20. I cannot see that it would make any material difference.

21. We have an abundance of good water on all the ranges.

22. About seven sheep are equal to one beef in grazing.

23. The growth of grass has increased in sheep ranges where not fed too close.

24. Sheep and cattle cannot be kept on the same range with profit.

25. There is no conflict between sheep and cattle men in this county.

26. We have in our county about 15,000 cattle and 100,000 sheep.

27. I would by all means suggest that the public lands be surveyed, and that every citizen be given 160 acres where the land is agricultural, and 640 or more of grazing land, and this in the most direct way and at just the expense of surveying.

28. There certainly is much trouble in finding the corners of surveyed lands in this county, and in fact it is impossible in many instances because there are no corners. And, as I have already said, we can never have an efficient survey until the government will pay what it is worth to do the work. A post at least 6 inches square should mark the corner of every section, and it should be 2 feet in the ground and 3 feet above the ground. This would enable poor men looking for lands to know where any given piece of land is without having to resort to a surveyor, as they now do.

TIMBER LANDS.

1. About one-half the land in the county is timber land. It consists of redwood, red fir or Oregon pine, spruce, cedar, white fir, hemlock, oak, and maple; but the kinds used for manufacturing into lumber are redwood, spruce, and Oregon pine.
2. No kind of timber is planted in this section; it is not necessary.
3. I would sell the timber lands to those who wished to manufacture it in such quantities as would justify them in making the necessary outlay. The price should be $5 per acre for redwood, and $3 per acre for spruce and Oregon pine, This would not be too high for those who wished it for immediate use, but too high to buy on mere speculation.
4. I think it would be well to divide the timber land into two classes so far as price is concerned. First class should constitute the redwood, and the valuation be $5 per acre; second class pine, spruce, and fir, and the price be $3 per acre. The other timber lands that are good only for wood should go into the agricultural class.
5. There is a second growth of redwood, spruce, and pine, but it will come to no perfection in one generation.
6. We have no forest fires in this county that injure the timber in the least, in fact fire has no detrimental effect on redwood. It is well-nigh impossible to kill the standing timber.
7. There are no depredations upon the public lands in this county.
8. We have no local customs governing such cutting of timber. The habit does not exist.
9. I think those officers are generally too far removed from the forests in order to exercise any beneficial supervision without the aid of local deputies. It seems to me that as long as we have local officers they are the proper ones with whom to lodge such jurisdiction.

EUREKA, *October* 20, 1879.

My knowledge of lode and placer claims, and mining in general, is too limited to admit of advancing any opinion upon the subject. If what I have said shall prove of any value to the Commission I shall be well paid for my trouble.

Respectfully yours,

JOSEPH RUSS.

Testimony of A. A. Sargent, lawyer and miner, San Francisco, Cal.

Testimony of ex-Senator SARGENT before the United States Land Commission:

Question. What is your name, residence, and occupation?—Answer. A. A. Sargent, San Francisco, Cal.; occupation, lawyer and miner.

Q. How long have you lived in California?—A. Thirty years.

Q. Have you acquired or sought to acquire title to any of the public land of the United States; and, if so, how or under what laws?—A. I have, under the mining laws, title to a placer mining claim.

Q. What additional means or opportunities have you had to learn the practical workings of the public land laws?—A. My residence for most of the time mentioned has been in Nevada County, in the midst of a mixed mining and agricultural population, where questions as to both interests were constantly arising and referred to me as a lawyer or as a public man, and I had the conduct of much of the litigation that arose in consequence. Added to this I served six years in the House of Representatives and six in the Senate at Washington, and was in correspondence with thousands of my constituents all over the State on land questions, and I helped originate much of the legislation for the disposal of mining and other public lands which has been passed by Congress during the past ten years.

Q. Have you observed any defects in the practical operations of the land laws which, in your opinion, ought to be remedied? If so, state fully such defects and any suggestions you may have to offer in the way of remedying them.—A. In California the conditions are peculiar, and a general land system adapted to the older States works here to the disadvantage of the general government and settlers. For instance, it is a

good general rule that the public lands shall be sold in quantities not to exceed 160 acres to actual settlers. But such a law consigns to perpetual barrenness the great stretch of desert lands in the Tulare Valley and lands similarly circumstanced. An actual settler would starve there. He would have to haul subsistence for himself and his cattle and even water to drink. To irrigate his piece of land—and he could do nothing without irrigation—he would have to build a canal miles in length, which his little patch would not justify. Some means must be taken to secure associated capital. The land is fertile enough, and bears excellent crops with artificial irrigation. Congress passed a law relating to desert lands in California March 3, 1877, by which capitalists were induced to expend large sums of money in redeeming part of the Tulare Desert, with very beneficial results. One year after their operations commenced their fields were the only fertile spot in Southern California, from Lathrop to the Colorado River. The operation of this beneficent law has been impeded in the Interior Department to such an extent that capitalists have been deterred from taking up and redeeming more land, of which there is an immense quantity of the same kind, and those who have embarked in the enterprise heretofore are denied title, though they have fulfilled all their duty under the law. Congress seems to have done its full duty, wisely and well, in providing a means of redeeming these deserts, but the mode of administering the law has defeated its design. This is a "defect in the practical application of the law" well worthy the attention of this Commission.

Again, in regard to timber lands. The great timber belt of the Sierra Nevadas is admirably calculated to supply the wants of a vast population on this slope for lumber for dwellings, fencing, mining, &c. But to produce this lumber it is necessary to use saw-mills, and the latter cannot be erected and run on 160 acres of land. The present law for the sale of timber lands is too restrictive in the amount allowed to one purchaser, and its machinery is too cumbrous. It would be well to allow a person to buy at least a section, and to buy on unsurveyed as well as surveyed lands. The job of surveying the Sierra Nevada Mountains is too formidable, while here and there are found patches of valuable timber which would be preserved from fires and depredations in private hands, and could be surveyed and segregated as sold or applied for, without regard to the rectangular system of surveys.

There is another class of lands in California, viz, grazing lands, which ought not to be subjected to the pre-emption or homestead system, because the lands are not fertile enough to support life on limited areas. These lands are good for cattle or sheep ranges, and should be sold at a less price and in larger quantities than fertile lands.

Q. In how large quantities ought grazing lands to be sold?—A. First-class pasture land requires from one to two acres to support a sheep, and from three to five acres are necessary to keep a steer. A man could not make a living off the increase of stock that a thousand acres would keep. I would sell, in five or ten thousand acre tracts, all lands fit only for grazing and at very low prices. Then I would compel cattle and sheep men to buy, or follow them up and enforce the payment of a round sum for every sheep or head of stock pastured on the public domain. I would first give a chance to buy at reasonable rates and in adequate quantities, and then levy a toll on the animals of those who refused to buy. This would protect the men who buy land and use it for grazing purposes from the dishonest advantage gained by others who pasture their stock on one or two hundred thousand acres of government land for which they pay nothing. It would make a market for grazing lands, to the advantage of the government, and reduce to an honest industry a pursuit which now has many of the features of Arab life.

Q. Is it not the fact that title has been obtained to both timber and grazing lands, under the pre-emption laws, under pretense that they are cultivable?—A. Without doubt the title to both has been obtained by questionable oaths and sham improvements to a considerable extent. But this has been almost a necessity. It has been so less with grazing than with timber lands. It ought not, of course, to be so at all; but the government is as much at fault as the pretended settler or more so. If it wishes to dispose of its lands, as it does, it should provide a mode of sale adapted to the class of lands. The settler must have them—he must have timber and cattle ranges—but the law provides no ready and practicable mode of obtaining them. Before the last Congress acted on the matter there was no law for the sale of timber land in California. There was an opulence of timber all around us, guarded by savage laws against trespass, and no honest mode of acquiring a stick of it. Towns might burn down, farms be unfenced, and mines unworked for want of timber; the law was inflexible. What wonder that men tried to get the timber land by pretended settlement and paying for it under the pre-emption laws, though they knew that the settlement and cultivation which they swore to was but a sham? Congress at last gave partial relief, but it is inadequate. The want of understanding of the subject in the other States is the principal impediment to proper legislation. Care should, of course, be taken to prevent the timber belt from passing into the hands of speculators, though that would be a lesser evil than keeping it locked up in the hands of the government, refusing to sell, as it has for years past.

Q. Please state the conformation and physical character of the public lands in your county and State, so far as known to you; and whether agricultural, pastoral, mineral, timber, or otherwise.—A. The surface of California is greatly diversified by mountains, hills, and valleys. It contains vast tracts of each kind of land named in the question, to which may be added well-defined desert lands, gaining their quality from the slight rainfall rather than from defect of constituents in the soil. The mineral lands are intermixed with agricultural lands in the foot-hills of the Sierra Nevada, and it is better as a general proposition, in legislating in reference to these mixed lands, to proceed upon the presumption that they are mineral rather than agricultural, so that a person applying to purchase lands in the mineral belt as agricultural should be required to furnish proof, to the satisfaction of the land office, that it is more valuable for agriculture than for mining.

Q. Examine the act of Congress prescribing the duties of this Commission, &c., and referring to your answer to the last interrogatory, state how, in your opinion, the government can best ascertain and fix the character of the several classes of land named by you; whether by a general rule, or by geographical divisions or otherwise?—A. I do not see how a general rule can be made applicable. The boundaries of these various classes of lands can be arrived at without any very close survey. Suppose, for instance, all lands in the Sierras between 500 and 3,500 feet above the sea level were presumptively mineral lands, all above that altitude timber lands, the Tulare Valley and designated parts of the San Joaquin and other valleys desert, the coast range and certain other hills grazing land, &c., &c., with power in the land office, on proper showing, to set aside the presumption and treat land in the named boundaries as of some other class—it seems to me that some such system as this would reach the peculiarities of this State.

Q. State the system of land parceling surveys which, in your opinion, would be best adapted to the economic uses of these several classes of land; giving your reasons and your practical acquaintance with the subject of surveys.—A. Mineral-land surveying cannot be done better than it is under the present system. Agricultural land, which should be disposed of in not exceeding quarter-section tracts, should be surveyed in the present mode, except in cases of isolated mountain valleys, where connection with regular meridian and base lines should not be required; reference to natural local monuments being sufficient for identification. Mere timber and grazing lands should be surveyed in large lots, and not sectionized. My reasons are that these proposed methods seem best adapted to the various kinds of land; but I am not a practical surveyor.

Q. How far has water been taken up in your section, and for what purposes?—A. My home for a great many years has been in Nevada County, in this State, an actively worked and productive mining region both in placer and quartz mines. In that county, as in the neighboring ones in the foot-hills, water is taken up in canals for placer-mining purposes. The amount of capital expended in canals and reservoirs is very great. The claims existing to water are of very early date, and the rights have been recognized by our State courts and legislature, by the United States Supreme Court, and by Congress. These rights cannot be modified by legislation. Elsewhere in the State there are numerous irrigating canals, the principal ones having been constructed under the desert-land legislation of Congress. Undoubtedly there will be a great many more constructed if due effect is given to that legislation.

Q. What conflicts have arisen, if any, in relation to water rights?—A. Litigation over water rights was very common in the early history of this State, and much of the skill and learning of our supreme court was employed in devising and applying rules to meet the peculiar condition of things in this State in this regard. Such litigation has ceased, except in some few cases where there are disputes about facts of priority of location, amount of diversion, and such matters. The principles of law governing such cases were long since satisfactorily settled. Any good digest of California decisions will put the Commission in possession of full information on the subject.

Q. How would you dispose of public timber lands? State whether by sale, by lease, or otherwise.—A. By sale, certainly, and not by lease. The government ought not to keep the title to public lands, except such as it needs for its own purposes. It ought not to keep a host of agents to feed upon the Treasury and increase the number of office-holders. It should be the study of legislators to diminish rather than increase this class. Leasing the timber lands terminates nothing. It may lead to irritations and frauds. The timber will be better preserved in private hands. But I would not recommend putting the lands up for sale at auction, or submitting them to "private entry." Selling to separate purchasers in section tracts or thereabouts would be, in my judgment, the best mode of disposition. I would not classify timber lands as to manner of disposition, price, or size of tracts. It makes too much detail. Uniformity is sufficient.

Q What have you to say as to depredations upon the public timber, whether for the cutting of railroad ties, use for mineral, building, agricultural, or other purposes? State the extent of such depredations, unnecessary waste occasioned thereby, and what, if any, legislation is necessary to limit or prevent such depredations.—A. Depredations

upon public timber lands have been carried on ever since this State was first settled. In a large part of the State the timber had to be cleared off to make a place for residence and cultivation. In such regions it was the same as in the States east, where the native forests covered the land now occupied by improved farms, by villages, and cities. Men removed timber as a mode of settlement. Again, in all the mining regions lumber is necessary for mining. A miner must have timber to support his tunnels and drifts, for his flumes, &c. He must have logs to construct his cabin. Towns must be built, farms must be fenced, &c. As I have said, until recently there was no law to sell timber land (not susceptible of cultivation), and none for the sale of timber. Yet farms were necessarily cleared and fenced, towns and villages built, mining prosecuted. To take government timber for these uses was depredation; but the government which provided no means for the honest acquisition of the timber could not complain of its citizens, whose necessities, rather than their inclinations, them made trespassers. Of course this system has been wasteful, and should be effectually stopped. A law for the sale of the timber lands in reasonable quantities would stop it effectually.

Q. What experience have you had in mining and mine litigation?—A. I have been engaged in placer and quartz mining most of the time for thirty years. As a lawyer in large practice I formerly had charge of many suits involving conflicting mining rights. I am more especially engaged in placer mining.

Q. Within your practical experience are the existing mining laws, as to placer claims, defective, or otherwise? If defective, state in what particulars; having especial reference to the facts of original location under local customs or laws; the shape and size of such claims; their occupancy and development; the opportunities for consolidating two or more claims in one person by purchase; what evidence of the chain of title is required; what use is made of such claims other than actual working, if any; and what is the general character of the litigation relative to these placer claims.—A. I consider them excellent. The provision of the statute that dispenses with proof of original location and chain of title where the claims are ancient—have been held by the claimants and ancestors beyond the period prescribed by the statute of limitations—makes it possible to acquire title which any other rule would prevent. In early times, in this State, mining claims passed by delivery, there being no paper writing, in numberless cases, and such conveyance was upheld by the courts; the old records, which were kept by miners, in their cabins, have long been lost or destroyed. The best improved claim in the State could not be patented on any showing that could be made under a more stringent rule.

Some rule might be prescribed governing original locations *to be hereafter made;* but it would be difficult to prescribe one that would operate equally in reference to development and working. So much depends, in placer mining, upon water, and the seasons are so uncertain, and water is so frequently scarce, that, unlike the case of quartz mining, regular or profitable work, work in good faith and not mere form or show of work, is often impossible for considerable periods of time. A claim may depend wholly on the rains for water, and get none during a dry season. If the law should require so much work on a mine *every year*, during that dry year it could not be obeyed, at least in good faith.

There seems to me to be no objection to the consolidation of two or more claims in the hands of one person or company by purchase. Indeed this is often necessary for purposes of development. An individual or company may be willing to undertake the construction of a bed-rock tunnel, or long water ditch, for the mineral presumably in two or three claims, but not for that in one. The law should not hinder such enterprises.

Q. Within your knowledge are titles obtained under the placer law for non-mineral lands? And, if so, state instances.—A. I should say the practice is not extensive either way, but that, if either happens, mining land is more apt to be taken for agricultural land. It is sometimes a very close question whether land is more valuable for mining or farming. Its agricultural capacities lie on the surface, and can be seen by any one. The mining character is matter of development, which may not have taken place. Besides, as mining land costs twice as much as agricultural land, there would be no motive to procure it under the latter rather than the former character.

Q. Within your knowledge has the placer law been used to procure title to lode claims?—A. No; such cases must be of rare occurrence if they ever happen.

Q. Do you know valuable placer lands which are unworked because the outlets are controlled by claimants under other than mineral titles?—A. I know that suits are pending, by persons owning farming lands along the banks of streams which serve as outlets for mining deposits, to prevent the further prosecution of hydraulic mining. If such parties prevail in their actions and stop hydraulic mining, they will inflict a severe injury upon the prosperity of the State. The yield of gold from our mines comes very largely from hydraulic mining. This gold passes into the currents of trade and goes far toward maintaining the credit of the State and nation. Upon this industry several of the most prosperous counties of the State principally depend. The great system of canals, bringing water from the sources of supply in the Sierra Nevadas, costing many millions of dollars, was created to feed this industry. Opposed to all

this is the claim of a few people along a part of Bear and Yuba Rivers, that their farms are injured by tailings. It is in fact a question between populous communities conducting a great industry and (not agriculture or the farmers of the State) a few farmers, which shall cease work. The miners are not intentionally wrong-doers. They have bought their mines in good faith, put on costly improvements, and are engaged in a useful industry. There is an obligation on them to do as little damage as possible, and this I know they desire to do. But I cannot believe it good public policy to strangle this vast industry at the instance of a few persons who are inconvenienced by it, many of whom located at a comparatively late day on the mining outlets knowing them to be such, or in other words "came to a nuisance," and whose total product would not be missed by the State if subtracted from its resources. On the other hand, statistics show that the hydraulic mines yield several millions of gold annually. What it means to subtract that from the business of the State need not be stated. The principal market of the farmers affected is with the hydraulic miners or those who depend on their trades, and if all the mines were stopped which are involved in this litigation, with their depending industries, the whole Bear, Feather, and Yuba Rivers region would perish from inanition.

Q. Have the miners ever offered to make compensation for the injuries inflicted by them?—A. They offered a large sum to the city of Marysville to aid in protecting it from injury, and I doubt not would be glad to pay any reasonable sum which would be compensation and not blackmail.

Q. What interest has the general government in this question?—A. It has a vast interest. It is the owner of an immense area of mineral land, worth to it $2.50 per acre, which is continually being purchased of it, and means millions of dollars in its treasury.

Q. Has it not the same interest in the sale of agricultural lands?—A. True. But the amount of agricultural land so situated as to be affected by mining operations is extremely limited—not one acre to one hundred thousand of its unsold mineral lands. Another interest the government has in the prosecution of mining is to preserve its credit, which California gold has heretofore largely contributed to maintain, and will tend to do hereafter if still produced.

Q. What can the government do to protect this interest?—A. It is difficult to retrace lost ground. A stipulation should have been put into the agricultural land patents, issued for lands situated like those on Bear River, that they should be subjected to the easements of the mines above. The government could have better dispensed with the sale of the few thousands of acres on Bear River than lose the sale of its mining lands on Bear River and its tributaries, or for mining to be stopped on all of these. If it had sold, those who bought would do it with notice and could not now complain. That which it ought to have done before it ought to do in future. Again, the government should appoint a commission to study this question of hydraulic mining and drainage and determine if works cannot be constructed to carry off tailings and deposit them on the tule or swamp lands. Its great interest in its unsold mining lands would be adequate reason for its undertaking such work.

Q. Does not the prosecution of placer mining wash away agricultural land, and thus do more harm than the production of gold from it does good?—A. Placer mining land is rarely good for agriculture. Probably not one acre of it in fifty thousand would ever be cultivated. It is refuse land except for the golden harvest which it yields, which, however, often exceeds in amount, in a ready payment, all it would produce in an hundred years if good agricultural land. I do not undervalue agriculture. It is the basis of wealth, of course, and our State and the world is full of land for its appropriate and adequate prosecution. But I claim for the placer miner the usefulness of his work and his limited area of refuse land for its prosecution.

Q. Is it not alleged that hydraulic mining injures the navigable streams of the State and shoals the bays?—A. Yes, it is so alleged, and the statement is important if true. The general government should take steps to verify the truth of such allegations. At present such statements rest on no proofs. I remember what is called the "Hog's Back" in the Sacramento River in 1850, and it was as much an obstruction to navigation then as now. I have seen a newspaper statement that the water in the channel of Suisun Bay is deeper than it formerly was, and the bar of San Francisco labor is apparently unaffected. The flats in the bays are developing without doubt; but this happens everywhere, in civilized and uncivilized countries, and where there is and where there is not mining. The work is greatly hastened by man's agency, and the great cause of the degradation of the earth's surface and filling up water-ways is the stirring the soil by cultivation. But a rainfall of from 2 to 6 feet, like that on the Sierra Nevadas, on steep hillsides, necessarily carries off and deposits below vast amounts of earthy matter. Old Kern River is full and crowning with silt, and the water has forced a new channel, yet no mining has ever been done on it or its tributaries. The Platte is another case of a similar character. The Potomac River, opposite Washington, is full of flats like those of Suisun Bay, where plowing lands, digging roads, and such works only are answerable. The mouth and bed of Saint John's River, Florida, and Columbia River, Oregon, are illustrations of the filling-up of great navigable waters

by the ordinary washings of nature. The same effects are observable in Boston, Charleston, and Savannah harbors, &c., where there are no hydraulic miners to rail at as the abominable cause! If the Commission will visit Pacheco in this State it will see large grain warehouses buried to the eaves, I think, by earthy matter sent down by the wash of land, largely arising from farming operations. Ought not the owners to get out an injunction to stay farming in the valley and hills above them? All these causes hurt the navigable waters of the State, and the miner is not wholly or chiefly responsible. The great agricultural valleys of the State have been formed by *débris* from the mountains, and the process would still go on if there were no mining as it did thousands of years before the white man saw this region.

Q. Does not the great mass of earth handled by the hydraulic miner and the greater grade given to the streams make his operations more injurious?—A. The great mass of material that the miner handles stays at his dump or in the upper streams; it is only the loamy stuff, discoloring matter, that travels far. When men talk about hills being hydraulicked into the valleys they are wild. Probably 90 per cent. of a gravel bed cannot be urged by water more than a short distance after it drops from a flume. The mass is bowlders, gravel, pipe-clay, and other heavy matter. This never reaches the valleys, and could not unless the grade could be increased toward 30 degrees. Except between Smartsville and Marysville, where the distance is short, the increase of grade cannot be over an inch or two per mile for a quarter of a century's work, which is insignificant; but to speak of increase of grade of the mountain streams, having in view the lower bays or any effect on them, is idle. Filling in San Francisco Bay under authority of law, and so lessening its capacity to take in water to scour in and out and keep down the bar, is, in my judgment, more mischievous than the discolored water that reaches the bay from the mines. If this work of private gain and public stupidity goes on and damage ensues to the bar, the blame for this, as well as for the *débris* from agricultural work and from natural causes, will still be put upon the miner.

Q. Calling your attention to the fact that under present laws an adverse claim, in proper form and seasonably filed, suspends the administration of the mineral laws by the United States land officers, and transfers the jurisdiction to the courts of law, both State and United States,—please state whether, in your opinion, the adjustment of controversies concerning mineral lands prior to issue of patent should not be left absolutely to the United States land officers, in the same manner as contests under all other land laws?

A. I think not. First, Congress will not give adequate force to the General Land Office, and the work of its mineral division is now far behind. To add to its present work all the vast labor of reading the evidence and briefs or hearing arguments, and deciding controversies of conflicting claimants as to the title to mining claimants, would overwhelm it with business hopelessly, especially as applications for mining patents are constantly increasing. Second, many questions of fact arising in such cases can be satisfactorily settled by juries only, under the instructions of able judges, after argument in open court. The interests involved are too great to be satisfactorily disposed of by a clerk of the department, with such legal experience and knowledge as a small salary can command; to say nothing of the suspicions that would arise, however unjustly, of unfairness, corruption, or carelessness. Such matters are far better between the hands of a regular court of the vicinage.

Q. Ought there not to be a limitation as to a possessory title under the mineral laws; and should not locators be compelled, on penalty of forfeiture, to acquire the title by purchase from the government within some reasonable time? If so, what would be your idea of the time?

A. There should be no limitation of time, at any rate not yet. If all the miners in the United States were required to apply for their titles in one, two, or five years, they would do it little more than at present until the time approached, and would then block up the land offices with business that could not be cleared off in fifty years.

There would be great opposition and prejudice against any such proposition. Such a project was introduced into Congress some five years ago, and was followed by excited miners' meetings in the mining States and Territories, denouncing it and its promoters.

The mining laws are, as a whole, popular and satisfactory. They are beginning to be understood, and miners are more or less availing themselves of the right to purchase. It would be injudicious, by radical changes, to produce dissatisfaction, and retard the process of transferring the title to their claims to the miners, and the price of them into the government coffers.

The work of developing mines is frequently slow and expensive. The claimants sometimes cannot ascertain for years—employed in hard and expensive labor—whether they wish to buy or not. To compel them to buy an undeveloped claim is to make mining business still more uncertain, and may lead to shifts, by ficticious abandonments, &c., to avoid an onerous law.

In this matter I would earnestly recommend the Commission to "let well enough alone."

Q. With regard to quartz claims, what, if any, defects have you observed in the United States laws, their operation and administration?

A. I think the laws for the location and purchase of lode claims are in a much more unsatisfactory condition than the provision relating to placer claims. Where the croppings of a ledge are not visible through the whole length of a claim, the miner may expend thousands, perhaps a hundred or two thousand dollars, in determining the course of the vein, only to find that his location embraces but a small part of it; and some one who has not spent a dollar may get the ledge by an adjoining location. I understand that the Supreme Court of the United States has just decided that where a ledge goes out of the surface lines of a claimant he has no right to follow it. This is, perhaps, a fair interpretation of the quartz laws; but it suggests the need of amendment to avoid a great hardship and injustice to discovers. The old miners' law treated the subject better, and gave a locator so many feet from his starting point, in either direction, "following the ledge, with its spurs, dips, angles, and variations." This is common sense. It secured to the discoverer or developer of a ledge the full extent of his claim, no matter in what direction it ran under ground. It is often impossible to determine where the "apex" of a vein is, or its course, or the angle or direction of the dip, by the early workings, and therefore the intended rights of a discoverer are poorly defined and protected in locating a claim under existing laws. The impossibility of determining these things without extensive development, which must follow and not precede location, has led to much litigation and injustice.

Q. Is there any other feature of mining locations that leads to litigation?

A. Discoverers of veins, or their assigns, are sometimes burdened with litigation to defend their rights from subsequent locators in their immediate neighborhood, where the legal attack is directed to the portion of the dip of the lode which has passed beyond the exterior lines of the surface tract. But a quartz mine would be of no value, in most cases, where the locator had not the legal right to follow his ledge down at any angle it might take and to any distance. Only claims of extraordinary richness could be worked when the possessors were confined within perpendicular side lines.

Q. In view of the known variety and complexity of mineral deposits in rock in place, is it, or is it not, in your judgment, possible to retain in the United States mineral laws a provision by which locators can follow the dip of their claims outside their side lines without provoking litigation?

A. For the reason given, viz, that a claim would be usually valueless that could not be followed into the earth to any workable depth, it is essential to retain such a provision even if litigation does sometimes ensue. Such litigation is caused by questions as to identity of ledges and not from abstruseness of principle. I am satisfied that the government, in dealing with these matters, must get nearer to rather than farther from, the old mining laws, which gave the locator his ledge wherever it dipped, or however it crooked. It was still a question of identity, often contested, but the law did as much as possible toward assuring a workable claim to the discoverer and his associates.

Q. Would not all difficulties be obviated by making a quartz claim 1,500 feet square? Would not that give the dip as far as a miner would wish to follow it?—A. Such a feature in mining locations would be objectionable for many reasons. In many places, such as Austin, Nevada, Cottonwood Cañon, Utah, and in parts of California, the distinct mining claims and ledges are too close together to afford such space. One man would own too many ledges. Laws must be uniform, and while such a provision might aptly apply to the case of a ledge having a broad extent of non-mineral land each side of it, it would make mischief in numberless cases, and not be applicable in them at all. I doubt if it would be safe to predicate that in all cases where there are 700 feet of non-mineral land each side of a ledge that the dip would not carry the lode off the claim. Sometimes the dip is forty-five degrees. I have known it greater. It will be observed where the dip would take the 3,000 feet level. I reiterate, the only safe rule is to let the miner follow the ledge wherever it goes, in direction or dip, without regard to surface ground. If that right is restricted mining is made more hazardous and uncertain to the extent it is restricted.

Q. Have you ever taken part in organizing a local mining district? If so, state fully where it was done; by how many parties, and whether necessarily actual miners or citizens. What officers were elected, and their duties. What books of record provided, and their object?—A. I took part in organizing the quartz-mining district of Nevada County in 1852, at a meeting of the quartz miners of the county assembled at Nevada City, on published notice, and acted as secretary of the meeting. Some seventy persons were present, all of them interested in quartz mining. A code of laws was adopted, which has ever since been recognized by the miners, and often proved in and enforced by the courts. The county clerk of the county was made *ex-officio* mining recorder. He was required to keep in his office a book of records, open for inspection, in which any person locating a quartz claim was required to have his notice recorded. This duty has been performed down to the present day, though some of the early

books of record were destroyed, with the county records, by a fire that burned the court-house.

Q. State generally the mode of originally taking up and locating a mineral claim under mining customs, and the effect of a record of such location.—A. Locations were usually made by a number of persons, or by one person using the names of others, all of whom became tenants in common by such location. Location was made by setting stakes and putting up a written notice signed by the locators. Record was then made in the record book of the district, and work to a certain extent must be done, and continued periodically, else the claim was "jumpable." All these conditions being complied with, the right of the locators was sustained by the courts and public opinion. The effect of [such] a "record" was to give notice to others, and to conserve the right of the locators to the number of feet legally claimed.

Q. Is that record capable of subsequent amendment; and, if so, how?—A. It is, by subsequent notice posted and recorded, if no other right intervene, but not otherwise.

Q. Within your knowledge, have mining titles been disturbed or litigated through fraudulent manipulation or destruction of these records? If so, what security is there against such frauds?—A. I do not think this difficulty has ever arisen. Inconvenience arises from the accidental loss or destruction of records, but not from fraudulent manipulation of them, or, so far as I ever heard, from intentional destruction of them.

Q. Calling your attention to the fact that a copy of the certificate of location, as certified by the local mining recorder, is the sole basis of the paper title for a mining claim, under existing law, and that compliance with the varying customs of innumerable mining districts constitutes the preliminary acts upon such claims, state whether, in your opinion, all mining district laws, customs, and records could advantageously be abolished as to future locations, and the initiation of record title be placed exclusively with the United States land officers.—A. The principal objection to making the register of the land office the mining recorder is the difficulty miners would have in examining his records to ascertain what locations have been made. They could not travel such distances for such a purpose. The invulnerability of the records would be some compensation for this, but not adequate. Great care should be taken in abolishing "miners' rules and regulations." They contain a good deal of practical wisdom. The present law embodies some of them, of general application, and perhaps still more could be utilized. I should recommend this rather than their abolition.

I should like to remark that what I have said about the inexpediency of compelling locators of placer claims, under penalty of forfeiture, to acquire title by purchase from the government within a limited time, applies with equal force to the locators of quartz claims.

Testimony of James W. Shanklin, San Francisco, Cal.

JAMES W. SHANKLIN, State surveyor-general-elect of California, resident in Oakland, testified at San Francisco, October 8, 1879, as follows:

I have lived in the State more than twenty-five years.

Question. In what part of the State is agriculture possible without irrigation?—Answer. In that part of the State north of Monterey; particularly the valleys and a portion of the foot-hills, and in the mountains. I consider that portion of the State poor for agriculture without irrigation south of that; it does not have sufficient rainfall.

Q. You recognize the three classes of land—pasturage, irrigable, and timber. Now, won't you give us your idea of the best disposition to be made of the timber land, and what administrative system of disposing of it would be most advantageous to the State and tend best to the preservation of the timber?—A. The chief object in dealing with timber lands at all, either on the part of the United States or the State, is their preservation from waste, and to allow such use as is necessary for the people of the State and nothing more. The question to be determined is how this shall be accomplished. It can be accomplished in two ways: Either by the State under State control, or by the United States, through its officers especially appointed for that purpose and nothing else. Timber agents or foresters should be appointed. I do not think it can be protected in any other way under our present system of government. If you make it an adjunct to another office, it will fall between the two and nothing will be accomplished for its protection. I had something to do with that myself; for when I was register of this land office I had a good deal of work of that kind before me and I undertook to stop it, and I did stop one large company that had their railroad and steamboat employed to transport to this market the government lumber, and so effectually stopped it that it broke up their railroad and their steamboat too; but the department did not sustain me in it. Therefore, I say you must have a separate department to attend to that exclusively. If it is attached to anything else, it will fall between.

Q. What is the source of the destruction of timber?—A. By mills, fires, and by persons cutting off what they want for their own use and wasting the balance of the timber.

Q. What ratio does the amount destroyed by fire bear to that cut by man?—A. I should say at least twice as much, at the present time.

Q. Would not an organization of a corps of foresters or suitable officers for that purpose be an odious measure before the people?—A. Not at all; just the reverse.

Q. Could jurors be found to convict men for taking the timber for their own use, notwithstanding that it was in contravention of the laws of the United States?—A. That is another question. When you appoint foresters, the men having charge in different localities where the timber is wanted will provide means whereby people can obtain what they really require. Then there is no inducement to steal the timber. That is the object in having foresters—not to prevent the use of timber, but to provide the means whereby a reasonable amount can be used under their supervision. In other words, allowing them to exercise such control as shall best subserve the interests of the people and of the United States. I will answer the second question in reference to the measure. There will be some men who will be law-breakers wherever you place them, but when you take away every inducement to break the law by giving them means whereby they can obtain what they require at a reasonable figure, I think they will be far less liable to break the law than under any other circumstances.

Q. Just recall the number of settlements and mills in special localities where timber would have to be supplied to the growing condition of the country, and then give me, in a general way, your idea of the number of foresters which it will be necessary to employ in the State for the purpose of properly protecting and disposing of it by such a plan. How many foresters would be necessary to protect and dispose of it?—A. My opinion is that it would require one only for each township where timber is to be used. Where timber is not accessible and cannot be used there is no necessity for such a forester. The revenue to be collected by these men would pay three times over the expenses of the foresters. The timber belt here is about 30 miles by 500 miles; that is, on the Sierra Nevada; the coast belt would come very near that too. I don't think the timber of the State should be sold in tracts, either to mill companies or anybody else. I think it should be kept and preserved for the people of the State.

Q. Please give us your own idea about the extent of the two belts of timber.—A. I should say that the coast belt would average about 20 to 25 miles in width and by 100 to 300 miles in length along the portion of the coast lying north of San Francisco. Then the Sierra Nevada belt would be about the same, or perhaps more; in some places it would be over 40 miles in width and in some places not over 20. It would have an average of about 30 miles in width and extend over the northern portion of the State down to the south of it, to the San Joaquin Valley, being about 450 miles long. In addition to that, between the two belts, there are many groves in the north. South there are none, except between Point Concepcion and San Bernardino. When I speak of the government not disposing of the timber lands in large quantities I do not intend by that to exclude settlements where cultivation is possible. After the removal of the timber there is left, as the result, land that is valuable for cultivation—good arable land after the timber is taken off. I do not object to its being sold to actual settlers.

Q. The purpose of these foresters would be to care for and protect the timber?—A. Yes, sir.

Q. The timber area is valuable for what purpose?—A. For its timber, but a portion of it would be valuable for fruit-growing and occasional small homes. The orchards would grow up to 3,000 feet, and the timber commences from 2,000 feet. At 2,000 feet it is the nut-pine. About 2,500 feet commences the yellow and the pitch-pine. Then this goes on up to the summit. The timber valuable for commercial purposes is not found to a great extent where these orchards could be established.

Q. What objection would there be in permitting men to own homesteads of agricultural lands in the forest, providing that such men may obtain titles to small tracts of timber lands?—A. It would be like giving them a title to land in the moon. They could never use it, because of the distance of the timber from the agricultural land.

Q. Is this difficult for any other reason than distance?—A. Distance and cost of transportation. Transportation is very difficult, because the timber is on the mountains, and it would be necessary to construct roads or flumes to bring it from the mountains to the valleys, and this would be too expensive to the farmers, and they could not do it at all. The timber, to be utilized, must be utilized by persons connected with timber enterprises. It can be by nobody else to any advantage.

Q. Is it true that the present system of cutting the timber is wasteful?—A. I consider it wasteful in every sense of the word, and detrimental to the State, because there is no care taken to preserve it.

Q. What way is it wasteful?—A. By stripping the land and burning up a great deal that could be used. If necessary and proper measures were immediately taken for its preservation and for compelling them to use it instead of destroying it, it would be well. They only use the best part of the tree and let the rest lie and rot.

Q. What effect does the cutting of timber—taking and using the better portion and leaving on the ground the tops and wasted portion—what effect does that have on the fires?—A. It adds fuel for the fires and furnishes the best material for their spreading.

Q. The cutting of timber is mainly by mills for the purpose of selling it, is it not? Do they cut beyond the market, as a rule?—A. You would think so if you asked the older men of the State. At the present time, in this State particularly, they cut sometimes far beyond the demands of the market, either for home consumption or for shipment abroad.

Q. This timber is cut for use either by the State or people abroad. They send a great deal of it from this coast to the East. Does your scheme of foresters contemplate a stopping of this use?—A. No, sir; only to keep it within a reasonable control and compel the entire use of the material, so far as it can be made available, for any purpose.

Q. What is your property idea in regard to the forests?—A. It is this: to see that a reasonable amount should be used for the mills; second, that there is no waste allowed and the surplus, after the lumber portion of the tree has been removed, utilized.

Q. Would it be practicable for any timber mill to run by the designation of particular trees by the foresters?—A. Yes, sir. They themselves have to do it. They do not take the trees promiscuously. They have a man, to whom they give twice as much wages as to any other man, to select the trees and determine how they shall be felled. Every mill has its man especially for that purpose.

Q. In engaging in the lumber business is it not attended with much expense in the construction of flumes, mills, &c.?—A. Of course it is.

Q. Is that expense warranted unless they have large tracts of land to cut from?—A. I think it is, and I think there has been a mistaken policy on the part of lumbermen in securing large tracts of land. I have in my mind's eye now two or three companies (that have acquired large tracts of land) that are to-day insolvent, and that would not have been so had they done without these tracts of land. I know of one company that has over $50,000 laid out in lands obtained at cheap rates, and upon which the taxes amount to a great deal. They would be far better off to-day if they had that money in their pockets. They could have just as much income without owning that land as they have by owning it.

Q. Would you undertake the expense of putting up a saw-mill having only 160 acres of timber land to cut from?—A. No, sir; I would sooner undertake it without any land except that the mill stood on.

Q. What area of timber land would you deem necessary for the successful operation of a mill?—A. I should think at least 2,000 acres would be required; but wherever there is a mill put up without its owner possessing any timber in the vicinity of it, as the law now is and has been, settlers would take up 160 acres each, and being allowed to use the timber would supply the mill with timber at a less figure than the owner could get it by owning the land and employing his own men to cut it. I speak from experience. If there is a tract of timber extensive enough to supply a mill there is no necessity for restricting the mill men from cutting it, because settlers will settle around that mill on tracts large enough to supply all the demands of the mill.

Q. In view of the facts that the marketable timber grows above three thousand feet, and that agricultural people can only live below that altitude, what would they be there for?—A. The settler is there for the timber.

Q. Then it is but another way of disposing of the timber, is it not?—A. Each man has a right to take 160 acres, and it would be decidedly better for the mill company to have no land at all and purchase the timber of the settlers.

Q. Your idea is it would be better to have it pass into the hands of individuals than for the mills to have it in large tracts?—A. I think it would be better.

Q. How do you explain that?—A. I explain it from what I have seen in connection with the lumber business and from my own knowledge. I have owned one myself for about six years, and I found that I could obtain timber for the mill at much less expense from those who lived on the land and furnished me with the logs than I could to own the land and furnish the teams and everything necessary to bring it to the mill.

Q. Was not that owing to the fact that you could not get the land from the government and only through indirect and expensive ways?—A. No, sir; I did not have to pay the government anything to take all the timber we wanted.

Q. In every instance, whether by allowing each individual to purchase 160 acres or by allowing the purchase of land in large tracts—there is no distinction in particular—in every instance it is selling the timber lands for the purpose of marketing them, and the only distinction is you would divide it up among a larger number?—A. That is it; I would divide it up into small tracts, placing the purchasers of it under restrictions. The small owner would have no inducement to spoil his timber. He would protect it; and when you have the ownership of the timber distributed among many it would be far safer than to have it held in the hands of a few.

Q. Would not monopolists, if they could not get title to the land or the right to cut timber for themselves, but were dependent upon other people coming and taking up the timber and selling it to them, would not such a state of affairs deter them from entering into these enterprises?—A. That might be the case, sir. Sometimes it would be an advantage to the government to keep them out, and that would be of advantage to themselves and to the country. I do not think we should be allowed to export large amounts of lumber, and I do not think it would be a judicious law that would allow that to be done.

Q. Is there not danger of monopoly by allowing the sale of timber at private entry?—A. Yes, sir; there is some danger of monopoly, and especially on this coast, where monopolists flourish more than anywhere else in the United States. From the very beginning of this State it has been trammeled by a tendency to monopoly.

Q. What is the source of that danger?—A. Combinations of capitalists for the purpose of controlling the timber industry entirely.

Q. If these lands were sold at $3 or $4 per acre, the moment they passed into private hands they would become subject to taxation. Now, would the holding of these lands in large bodies without use be profitable for capitalists?—A. Yes, sir.

Q. Could they make anything by it?—A. That is another question.

Q. Would they engage in enterprises where there are no sure gains?—A. They do it just as men hold land. They think the chief wealth of the country must come from its lands, and hence they seek to obtain large bodies of it, and they hold it even where it embarrasses them. To-day I know of one mill company that has at least 20,000 acres of land purchased as high as $5 per acre. They would be glad to sell it, because they are financially embarrassed; but if they were not in these circumstances they would hold it. That land, in addition to other matters, helped to bring them into financial difficulties.

Q. Would not that tend to force them to distribute this timber land?—A. It will ultimately do so. Some put it into the hands of other capitalists who are able to buy the whole together. It does not tend to distribute it to the small owners, but that large tract has to be bought by concentrated capital. This would keep it in the hands of monopolies, and when they find that they can only make their property available by making still larger companies they will do so.

Q. Did you ever know of a capitalist who bought timber land for the simple purpose of holding it, when he was not actually engaged in the mill business?—A. Yes, sir, I do; in connection with lumbermen; men who were capitalists, but who were not lumbermen, but held land in connection with men who were lumbermen. It was bought for the purpose of supplying the mills. It would not pay simply to hold the lands without using the timber.

Q. Would not the vast area of timber land which you have described act as a practical preventive to any actual monopoly by timber men?—A. I think not at the present time. I think combinations could be formed which could control all the timber which was accessible.

Q. Suppose the government sold the stumpage upon alternate blocks of land, reserving each alternate block, would or would not that accomplish the purpose?—A. That would be much better than they are now doing. It would be supplying the present want and protecting the timber for the future.

Q. What system for disposing of the irrigable lands would, in your judgment, most thoroughly secure their development, ownership, and utilization by actual settlers?—A. My opinion is, the irrigable lands cannot be used by settlers to any great extent until such times as the means of irrigation are produced—until the main and distributing ditches that are necessary to make the lands available for the support of families are constructed. The building of the ditches must precede the settlement of the land. They cannot settle upon the land and live there until such time as the ditches are put there.

Q. Are these lands available to small settlements among men of small means?—A. They are not at present, sir. They are only available by the use of aggregated capital. They can not be used in any other way. The early law of this State contemplated the above mode of doing it. The law was passed in 1854; it corresponded with the Mexican law on this subject, and that was this: in any country where irrigation was necessary for the support of the people, that the people would be equally interested in making ditches and the distribution of the water be regulated by overseers or supervisors, and hence (like the old road law we had in the Eastern States where every man was compelled to go on the public work), regarding ditches as public work, a man had to pay his poll tax or his tax in proportion to the area of land that he held. They built the ditches and supported them in that way, and the distribution was then made under State law, without charge to those who had aided in building the ditches. This was a system of co-operative labor regulated by local laws. I listened yesterday with a great deal of interest to the allegation that the water rights had all been appropriated. I don't believe it. I believe that, under the law of this State, the water is under the control of the State; that corporations and companies

may build as many ditches as they please, but they have acquired no right to the water. We have never tried to override the law in this respect and claim the appropriation of it. But by law I think they never acquired it, and my reason for thinking that is this: that the early settlers of the State, knowing that there was land that must be irrigated to make it available, as in Mexico, in order to secure a proper distribution of the water and prevent its being grasped by corporations and individuals to the exclusion of others, a law was passed in 1854 devising these especial means of constructing the ditches and reserving to the State the control and distribution of the water; and these special laws, which named the counties wherein these privileges were to be used, have never been repealed to this day.

Q. Do you mean to say that these companies who are taking out this water have not such an exclusive right to it that no other company could come and take the water?—A. Yes, sir, that is my opinion of it, by charter or without charter.

Q. How about priority of right?—A. That gives nothing in the irrigable counties. In order to overcome that law in Tulare County, they tried to pass a law that would give them the control of the water. I refer to the law of May 15, 1854. Now, this law expressly claims the control of the water by the State and takes away the right of individuals to control the water. In Mexico they had two laws, and our State tried to preserve these two laws. When the miners began to leave the mountains where they had become accustomed to the mountain system of making ditches, and went to the valleys to make homes, knowing no other law, they carried that law into the valleys and practiced it. This is the only way they acquired the water. They did not acquire it by law. The law making a modification is the only one in Los Angeles—called the Bush law. I think if the United States attempted any system of irrigation, it would have nothing to do with buying up these companies. Under the new constitution of the State, which says the use of all water now appropriated or which may be hereafter appropriated for sale, rental, or distribution is expressly declared to be for public use and subject to the regulation and control of the State in a manner to be prescribed by law. No private control is allowed, and the old constitution was the same. There are no vested rights in irrigable counties—as the San Joaquin County. This early system which grew out of the law of 1854 was practically admitted. After the Santa Ana companies were organized to build a ditch, supervisors were appointed for the distribution of the water, and these supervisors have always exercised that power. They know no other law, and need none. Immediately below San Bernardino—you have the testimony of Judge North that at Riverside they built two ditches, and there they have adopted a system of appropriation, and claim the right to the water because they have built the ditches; and the result is that the two ditches take up all the water of that river and a great deal of the water runs to waste. In 1857 the people of Anaheim built a ditch and incorporated it under a general law, not under the special law. They took out the water, and since the Riverside ditches are in operation the people of Anaheim have not one-half the water that they used to have. Then, again, above Anaheim they built another large ditch and have taken out the water; that also takes the water from the Anaheim people. On the north side of the river there is another ditch, in the building of which I broke myself up, and we take out a quantity of it. Now, if the rights of private corporations are to govern along that river, who has the right to it? What will it end in? For the peace and protection of the people of the State it is necessary that it should be under the control of the State, so far as the distribution is concerned. Let any combination or any people build as many ditches as they please, but let the State say how much water they shall use, and when they shall use it.

Q. Has this question ever been decided?—A. No, sir; it has never been decided. All the early decisions of our courts relate to the uses of the water within the mining districts, and the real question for irrigable districts has never been tried. They have endeavored to control it by riparian ownership, but riparian ownership never meant diversion for irrigation.

Q. Let me call your attention to the United States law of 1866.—A. That law is that the companies shall have the right to the water, subject to the rules and regulations of the State. It gives them no right to the water except as the State gives it to them. (Commissioner J. W. Powell read the law.) You see it is all subject to the State law, customs, &c., and the customs are a part of the law.

Q. What effect would it have on the agricultural industry of this State if the riparian rights under the common law were enforced?—A. I do not think it would do in this State. I do not think it should be applied to the sections of the State that require irrigation, because it is too limited altogether. The man who owned the frontage along the river would have all the rights, and those back of that land would not have any rights; whereas if they were able to divert the water they could have reasonable use of it.

Q. Would not the best remedy, so far as the federal government is concerned, be the repeal of the law of 1816 and leave that question to the State?—A. I think it is that way now. I do not think it gives them any vested rights, except as regulated by the

State. It is the fault of the executive officers that the clause is inserted in their patents.

Q. Conceding that it is a question of construction, would it not be well to abolish that question of construction, and provide the patent should issue clean?—A. I think it should be abolished, and I think that the officer has no business to put it in as long as the law does not compel him to do so. The patent would be trammeled, and the law sets aside these trammels when it comes to the contest.

Q. What would be the effect of a system of disposing of the irrigable land, with the condition that the right to the water necessary to their reclamation should inure to the land and pass with the title to the land?—A. That is a question that would have to be examined very carefully, for this reason: Suppose you take the land of a district in which the water, you say, can be used, and a person could go higher up on the stream and carry the water higher up and bring under cultivation more land that he could make use of for orchards, and thus reclaim as much more land as that you have set aside as being reclaimable. That can't be done. My idea in reference to the irrigable land in the State is that a similar disposition should be made of it by the United States as is made of the swamp lands; that these irrigable lands should be put entirely under the control of the State law and not of the United States, so that the State, which is supposed to know what is best for the interest of the people, would adopt such a course as would be for their interest. The new constitution makes this provision, and I would adopt the same in reference to the irrigable lands of the State; only reduce the quantity, for no reasonable sized farmer can use as much as this, if he has to irrigate it. I think the quantity ought to be reduced. I think all the irrigable land of the State should be transferred to the State, and let it devise a system for the reclamation of the land and the distribution of the water. Let the United States send engineers into the field and determine what bodies of land can be irrigated from any particular stream. The new constitution says that the lands that belong to this State, which are suitable for cultivation, can be granted only to actual settlers, and in quantities not to exceed 320 acres to each settler, under such conditions as shall be prescribed by the law. Now, suppose we say that the land belonging to the United States which can be utilized shall be granted only to actual settlers in such and such quantities. Then, after the ditches have been built by the State or by the combination of the settlers that are on the land, let the settlers pay back to the State the cost of building the ditches. I do not believe the United States ought to control the lands that are capable of irrigation and that are worthless without it. I think they should be in the hands of the State.

Q. Is not your main objection to the application of the common law, really, that it would exclude the back lands from the use of the water?—A. That is it exactly. It excludes them from the use of the water.

Q. Suppose the United States reserved the right to the water on every alternate section; would not that remove the difficulty?—A. Not if you give the land along the stream riparian rights—the exclusive use of the water. This riparian law and riparian ownership is the use of it by a man for the length of his front, and to the channel, and he has the right to the exclusive use of that water. Suppose the Riverside company to have a riparian right; what becomes of the people below them, if they use all the water?

Q. If you apply the common law principle, do not you protect all the back country?—A. If you reserve a strip on each side, then you do away with riparian rights. The Mexican law is, in my opinion, the only good, sensible law that there is. That reserves the distribution of the water.

Q. I am contemplating, under the application of the common-law principle, to reserve a belt of land—every alternate quarter section—to the government. Would not that enable the back country to have a supply of water? Would it not answer the purpose of an easement for the back land?—A. That would do it, provided you did not give the entire control of it to the owners along the stream.

Q. If a system of that kind could be adopted, would it not answer the purpose?—A. Yes, it would do that. I do not believe in allowing the water rights of this State to go into the hands of any corporation or company, to the exclusion of every one else.

Q. Would a man be willing to make improvements on his land unless he was assured that he would have a perfect title to it? In order that the proper improvements should progress, a man must have some certainty that he could continue there and make it a home. Now, under these circumstances, would it not be beneficial if, by some process or other, the right to the water was made to inure to the land, so that by no state of circumstances thereafter could a man be deprived of the use of his water?—A. Whenever you build a ditch in connection with the land, for the purpose of using it with the land, the law should not allow any subsequent diversion in any other way. At the same time, it should not give to that one man the entire use of the water; others should be allowed to use it also. All reasonable security should be given to a man in the enjoyment and use of the water; yet unseen considerations might sometimes arise where it would be necessary to divert his water for the public good. Therefore, the

stress of the law should be to protect the man; but, over and above all, the public interest must be first considered. It would not be well to make a condition of things in regard to the water and the land which the law could not reach. My idea is that if the water was preserved until such time as it was needed, there would be sufficient to supply all wants. Our water-sheds are so abrupt that it flows off rapidly; but if you could retain it for four or five months there would be ample for all the irrigable lands in the State. I think the irrigable lands would be greatly increased by construction of reservoirs. Go into the southern part of this State, where the lands are irrigated by artesian wells. You will find reservoirs on every one of these land tracts, and they store the water there, instead of using it all the time, and thus they always have the water to use when they want it.

Q. What do you think of the pasturage lands?—A. They have been a source of a great deal of trouble in this country between the cattle men and the sheep men. In that portion of this country south of Monterey the grass, on account of the litte rainfall, is not abundant, and hence it takes a large area to sustain an animal, and in proportion to the area that is necessary to sustain one animal you must increase the quantity. Ordinarily, in order to justify a man giving his time and attention to the keeping of stock, it is necessary to increase the area in proportion to the cattle he has. One hundred and sixty acres of ordinary pasturage land in this State, south of Monterey, would not do. No man could take 160 acres of ordinary pasturage land and support his family, or do anything toward it; hence, if you wanted to divide the tracts into pasturage districts, you must give even the poor man a much larger tract than you do in the Eastern States, where they have plenty of grass. The grasses here are not like those in the Eastern States. We have no grasses from the sod. They grow from the seed; they are annuals; and whenever the seed is prevented from falling, as it has been to a great extent from excessive pasturage for the past few years, we have no grass, or comparatively little to what there was in the early days. If we had rains enough to make a sod, a less area would be necessary for the support of the stock. The clover has disappeared and the wild oats have almost done so, and the cattle go over a range and tramp it hard, and that must necessarily decrease the grass from year to year. I do not think that, taking the ordinarily good parts of this State, less than 1,000 acres would be worth a cent to a man, and from that I would give him up to 5,000 acres. In this State, on the ordinary pasturage lands, it will take 5 acres to support one animal. A head of beef ready for the market is worth from $14 to $20. They are not worth anything until they are four years old. A man in this State who has 250 head of cattle can easily send 25 a year to the market, and at 5 acres to the head that would be more than 1,000 acres. I would offer about 5,000 acres even for a poor man. That is as little as he could make a good living for his family off of.

Testimony of O. B. Stiger, San Joaquin, California.

O. B. STIGER, of San Joaquin, Cal., October 24, made the following statement:

I have lived in the State since 1849. I am familiar with the timber industries so far as this section of the country is concerned in Yuba Placer, Sutter County.

Question. What is the condition of the timber as found here?—Answer. We have the heavy sugar-pine and the yellow-pine timber.

Q. Is the region of country where the timber grows of any value for agricultural purposes?—A. They are of very little value for agricultural purposes; it is mostly mountainous. There are valleys that would be good for agricultural purposes but the larger portion of it is too mountainous.

Q. Is the timber being destroyed?—A. Yes; very extensively.

Q. What are the chief sources of destruction?—A. The lumbering business.

Q. Is there much waste in the business?—A. Yes; considerable. A great many large trees have been felled and not utilized after they have been cut down, and allowed to go to waste.

Q. Is there much destruction by fire?—A. Yes; there is a great deal of destruction by fire and waste. Year after year a great deal of the timber have been thus destroyed.

Q. What effect does the cutting of the timber and leaving it lie on the ground have on fires?—A. It is a feeder for the fires; that the trunks of the trees that have died will increase the fires.

Q. Do you think the fires spread in regions that have been cut more than in regions that have not been cut?—A. Yes; vastly more.

Q. What system of disposing of this timber would you suggest that would conduce to its protection and still leave the timber available for industrial purposes?—A. I would suggest a law of Congress to prevent any person from cutting timber on the public lands at all; I do not know any other mode by which you can protect it. If people are allowed to go and chop down trees at will this destruction of the timber land will go on; as there is no one planting timber around here, it will all be destroyed.

Q. Could such a law be enforced?—A. Yes; I think such a law could be enforced here. I think a man could be indicted, but it is impossible to tell whether he would be convicted. Many complain because where the jury ought to convict they do not do so.

Q. Would the sentiment of the people then be against the timber cutters?—A. I think the feeling is the other way. I think it would be a dead letter unless it was enforced by persons authorized by the general government to enforce the laws. I think the juries would acquit them every time. The sentiment of the people is so against protecting the timber that I don't know but what it would be a dead letter.

Q. What would be the effect of putting the timber lands in private ownership?—A. It would have a tendency to protect the timber. They would only take so much of the timber as would answer for their private purposes; they would then protect it.

Q. If the timber was put into the market would it be taken up?—A. I think it would wherever it can be got at for lumbering purposes. In large portions of this section of the country the timber has been taken off entirely. There is very little left standing here. We have had a great many saw-mills in the neighborhood, and they have taken off all the timber for lumbering purposes.

Q. Are you familiar to some extent with the belt of country which has been reserved as mineral?—A. Yes; I am pretty well acquainted with that section that has been reserved.

Q. What, in your opinion, does the effect of reserving that land have on the agricultural and mineral industries?—A. I think the effect it has had was to compel a desire to take up agricultural land. A person then does better for agricultural than for mineral purposes. If it were not so, large portions of the land would not be taken up of agricultural land which is mineral. I think it has been a benefit to the mineral section of the country, and I think it would be beneficial in the future to keep it so. The obstruction to the prosecution of agricultural enterprises is less than the injury which would be to the mining enterprises. I think if you took off that restriction to require the miners to prove that there was mineral on the land, large portions of the country would be taken up of the agricultural land that was mineral. I think it would be very difficult to prove it mineral; as it is now, agriculturists cannot determine the character of this line. I think it best to leave the matter as it is. I think it would be a good idea to let it be taken up for agricultural or mineral purposes, making the price the same. I think it would be a good idea to put the land all at an equal price, and let the agriculturists or miners come in and take such land either as agricultural or mineral land. It would then require no proof as to its agricultural or mineral character.

Q. State such facts as you are familiar with relating to *débris* question.—A. The mining industries began here when first I came into the country in 1849, and there was very little agriculture here at that time. It was chiefly going on in the valleys below this belt of coast that is being washed by the hydraulic process. I was among the first settlers in the town of Marysville. I was there in 1849. There was then no farming at any place except at "Hop Farm." In that portion near Yuba City, in Sutter County, there was no agricultural work going on at that time. Hydraulic mining was known as early as 1853 and 1860. They were working extensively. In these valleys, where hydraulic mining has been in progress, they commenced agriculture in 1852 and 1853. I was a resident at Marysville when they commenced sowing wheat and grain in Sutter County. By 1860 there was considerable agriculture developed. The two industries have grown up together. I came to reside at this place in 1853, and they were working hydraulic mines here then. Since 1860 large quantities of water have been used.

Q. To what extent does this hydraulic mining injure agricultural land?—A. I know but little of the land and the injury received along the rivers. It has covered a very large extent of country on the Bear River, in the neighborhood of Marysville, and that large portion of country which lies on the south side of Yuba River has been entirely destroyed.

Q. How large an area is that?—A. I think about the distance of 14 miles from Yuba River south, and extending along Yuba River 12 miles, a very thick deposit has been made there. Where the Yuba River channel was there is no channel there now. It was mostly sand, with a very little gravel, that we called "slickens." That portion of land lying next to the Feather River, I noticed, is not covered with *débris*.

Q. At what season of the year are these slickens carried on the land?—A. When they have freshets in the winter season. When the river is very high these slickens are then carried down. The slickens is held in solution, and is carried down and deposited, and then it is baked dry, and it is then called "slickens."

Q. Is there any possibility of determining what is slickens, what is only wash of the streams from the country around?—A. I suppose you could only tell by the color of the water. I have seen the rivers when they were thickened by the wash from the surface, and I think by the color of the water you can tell the difference.

Q. To what extent is the country being washed due to the construction of roads,

plowing of the fields, &c.?—A. That would aid some; but I do not think it would be aiding very materially to it. The agricultural works in this section of the country are so sparse that I do not think the plowing of the land has much to do with it.

Q. Can anything be done with this material?—A. I think the slickens, when it has passed upon the land, is beneficial to the land. If you keep the rocks and sand from coming upon the agricultural land, the slickens are beneficial to it when it comes on the land alone. It is only in time of freshets that gravel and sand is carried down on it to the land.

Q. Can the gravel and sand be disposed of?—A. I think it can be, and I think there is a process that will prevent it from going on the farming land. I have an idea which I think would protect it. I have found in passing over the country that a system might be arranged so as to protect the agricultural land from the *debris*. I mentioned it to Professor Van Schmidt when he was here and he thought it a good idea. My plan is to have the land condemned by the State for miles this side of Marysville; then construct this side of Marysville a row of pilings and catch the *débris* there; then construct a system of ditches and carry the slickens off into some of the marsh lands.

Q. To what extent does land belong to the government?—A. I think a good deal of it belongs to the government, and much of it belongs to the railroad company, and some of it is in private hands. Condemn that which is in private hands and pay for it, and construct this system of piling, and I think there would be money in there to run these mines for fifty years. The only difficulty in the way is in regard to Smartsville, whether it would give them enough room for dumping. That is the best section for mining in the country.

Q. Would not the government be compelled to condemn that land under "mining domain."—A. They can take it under that principle. They can have the value of the land appraised and ascertain its value.

Q. Is it not generally allowed by the courts that under the exercise of the "mining domain" it can be done for public purposes altogether?—A. Yes.

Q. Could this be considered as a public purpose?—A. That could be developed.

Q. Would it be so considered?—A. Perhaps not; I think it doubtful.

Q. Is there land enough belonging to the government for reserving for that purpose of farm and dumping ground in these mines?—A. Yes, there is land enough belonging to the government if it could be had for that purpose; but it is intermixed with private land, and I do not think it would be available.

Q. Have you any means of estimating the quantity of material carried down annually?—A. No, sir.

Q. Your opinion is, then, of the *débris* which is carried down, that by far a greater portion of it comes from the hydraulic works?—A. That is my opinion. I have reached that conclusion from my knowledge of the channels of the rivers through which the *débris* passes. I have seen the banks of the Yuba River, on the Marysville side, when they were 40 or 50 feet high, and it is almost filled up now with *débris*.

Q. Is there any great proportion of the coarse *débris* passing down in flood times?—A. No, sir; I think not. The gravel and sediment remain in the rivers, but considerable sand passes down. A large quantity of the sediment remains in the river beds. It is mostly sand and light gravel that passes down.

Q. In case this land which is now classed as mineral land was sold by the government, how large an amount would you allow a person or corporation to take up?—A. To any individual I would not sell a larger proportion than 40 acres. If it was a corporation I would sell in proportion to the number of individuals composing that corporation. I do not think any one man ought to enter more than 40 acres of mineral land.

Q. How about the agricultural land?—A. I would sell the agricultural land in 320 acres of the tracts that are in the mountains here.

Q. What effect does this reservation which the government makes on all the mineral in the land have upon the title of the person who acquires agricultural land, in proving its non-mineral character?—A. I do not think it has interfered at all. I have never known a case where a man who obtained his patent to land for agricultural purposes was ever disturbed. I do not know of a case where two persons claimed the land, one for agricultural and the other for mining purposes. I know of only one case where the land located as land for agricultural purposes, who made application to the government for a patent for a homestead, and afterwards went to work for the purpose of ascertaining whether there was any mineral on it, because he could not make anything on it as agricultural land and wanted to try and prove it mineral land, and thus cheat his creditors, as he had a mortgage on it. I do not know of a case where the title has been acquired as agricultural land, and no other persons have gone in and tried to obtain a right to the land as mineral land.

Q. Does this practice of reserving the rights of mines upon land which may have been patented as agricultural land have a tendency to weaken the title?—A. I think they do. I know of a case which I could cite, and where it has injured the owner of

the land because of the reservation. I think it has that effect. I think I can point out land where the title has been acquired for agricultural, and if they attempted to sell it to-day persons who wanted to purchase it would be fearful of doing so on account of this reservation, because it is possible that there is mineral upon that land.

Q. Have you ever known any cases of conflict between the owners of land and persons or corporations who desire to run ditches across them?—A. Yes; I have known cases of that kind where there has been difficulty growing out of the fact that persons claimed it for agricultural purposes.

Q. Can any compensation be claimed for that right of way?—A. They claimed it, but I have never known a case that has ever been tried in the courts in the matter of the right of way. I think Congress passed a law, and they generally settle in courts with that law of Congress. There is very little litigation on such subjects in our courts; the matter is generally arranged by proving in the right of way. There has been some difficulties, however, growing out of such matters. Any reasonable corporation would much prefer to compensate a person for his right of way than undertake to ride over him rough-shod, because the ditch owners are sometimes troubled by bad men cutting ditches.

Q. Suppose the timber land was open for sale, who do you think would buy it?—A. Mill owners.

Q. Practically, at present don't mill owners prefer to buy their logs to owning any land?—A. Yes; they prefer selling them in preference to buying them, or get somebody to sell them for them. A man will go and enter a quarter section of land, a mill owner will buy the timber of him, and as soon as the timber is taken off the land is valueless; the man will not pay for it, he just enters it. That is the way they sell it. Hundreds of acres of land within a radius of ten miles of this spot have had all the timber taken off the land and never paid for.

Q. Would there be any improvement if the land was open for private entry?—A. Yes; that would prevent a man from taking the land, and would compel him to pay for it, and will protect timber.

Q. Will it not require an army of men to enforce any such law?—A. I do not know. Uncle Sam is very strong, and if he had some such law on the subject, I think it would help matters.

Q. Suppose you were to put this timber land in the market, what would you do about mineral rights?—A. Men would buy land for timber purposes and thus acquire title to a great body of mineral land. I propose that the government shall put the mineral land, as well as the other land, at the same price and let them purchase it for any purpose they please.

Q. Then a man might get title to the mineral land; and would it not be an impediment to the prospecting and developing mines?—A. I would limit the mineral land to forty acres to any one person. If a corporation was formed for mining purposes, I would let the timber go with the land that they occupy for that purpose. A large portion of the land is not mineral land here. There is only a belt of mineral land that runs through here, starting from French Corral and extending up to the Sierras.

Q. Can quartz mines be found anywhere in the Sierras?—A. I know very little about quartz mines. We have no paying mines here.

Q. Suppose in the heavily timbered country, which is valuable for timbering purposes (you say it is necessary to sell that land to mill men, as they now do, they must allow them to take a large quantity of it), what effect would the reserving of the subterranean rights have, giving them title only to the surface. May a man who wished to engagein quartz mining do so on condition that he should pay any damage that he had done to the agriculturist who had the surface right?—A. For quartz mining that would answer very well. You could sell it then for timber purposes and for quartz purposes, but I do not think it would do for hydraulic mining at all.

Q. I was speaking of the quartz, not of the hydraulic mines.—A. Yes; the disposing of the surface, leaving the quartz open for the miners, I think would work admirably. I would make the title to the surface complete and give the miners an opportunity to work the subterranean rights. The miners would, of course, have to pay for the damage done to the agriculturists.

Testimony of B. B. Spillman, Yuba City, Cal.

MARYSVILLE, *October* 28, 1879.

B. B. SPILLMAN, of Yuba City, Cal., made the following statement:

I have lived here 28 years.

Question. You are of course then familiar with this question of the spreading of the *debris*?—Answer. Yes, sir. I have lived in Sutter County twenty-eight years and knew these rivers when the water was all clear and had high banks. I have known since

hydraulic mining has been used their filling up and to have no banks and their overflowing and destroying the land.

Q. When did this commence—this change?—A. This change commenced about 1860. It was very perceptible at that time and has been increasing ever since.

Q. What is the effect of this on the Feather River country?—A. You mean west of Feather River?

Q. Yes.—A. You mean below the mouth of the Yuba River. The result is from this filling up that did this. The land lying anywhere adjacent to the stream is in a great measure liable to be lost, and that very soon.

Q. Is the *débris* ever carried across Feather River?—A. I do not know. I have not been there lately, but the river has no banks, but relies on the levee to keep the water out. If the water comes on the land it renders it unfit for cultivation. The land lies flat and the water will not go off in time to produce crops. Above here Feather River overflowed the land last year from the fact that there was no discharge for the water, because it was filled up so. The water backs up above the levee and runs on the land and injures it. This land never had any water on it before. It is all through there being no discharge for the water. They fill up so below it increases the water above. It is getting worse every year.

Q. Are the citizens abandoning their farms?—A. They are not abandoning them, but I think some of them want to sell out. I look upon the land as being injured materially. The levees are very expensive and unreliable, and without sufficient protection. By levees alone this land cannot be cultivated. It is only a question of time, in my judgment, whether the levees will be sufficient to control the water and if it continues to fill up.

Q. Have you any idea of the approximate amount of land that is overflowed by reason of the damming of the waters of the Feather by the Yuba River?—A. I cannot give any correct statement of that, because I am not in possession of the facts, but it is very large. The extent of the lands on the Yuba is very large.

Q. Does it affect many farms?—A. Yes. Many farms are totally destroyed on the Yuba River, and many on the Feather River also.

Q. How many?—A. I don't know how many, but many thousand acres of land are destroyed. The most valuable land in this State is now nothing but a lake. It cannot be cultivated because it is covered up with sand upon which willows are growing. Every year the water is in among the willows. A large body of land opposite and south of here, and the finest I know of in the State, is totally destroyed.

Q. Are you acquainted with the Yuba River Valley?—A. Yes, sir; I first resided in this county.

Q. In what other ways is land damaged on Feather River?—A. The damage by the damming is in various ways. One is land owners now have to be heavily taxed to build levees, whereas the people did not have to pay for them in former times. They pay heavily for this alone and while they are damaged all the time it thus reduces the value of lands. It seems to me that it is only a question of time when they will have to be abandoned unless there is a remedy applied in some way.

Q. What remedy have you to suggest?—A. Only to stop the putting of the *débris* in the rivers and try and scour them out. I think the rivers would gradually carry out the suppression of the *debris* that is now in them and they would in time have a deeper channel, but if this *débris* continues to come in I have no hopes at all. There is a large body of land lying south and west of Yuba City upon which money has been expended in its improvement, and I think if this thing continues it will be a total loss. That is my judgment from observation in the past.

Testimony of Sampson Thomas, of San Joaquin, Cal.

SAMPSON THOMAS, of San Joaquin, October 24, made the following statement:

Question. How long have you lived here?—Answer. I came here in 1859.

Q. Are you familiar with hydraulic mining?—A. Yes, sir.

Q. To what extent do you think the agricultural lands are being injured by hydraulic mining?—A. I do not know; I have not been in the lower country much. I suppose they have been injured some, but not to the extent that they claim down there.

Q. Are you familiar with the settlements in this country?—A. Some little.

Q. Which of the two industries were here first; the hydraulic mining or the agricultural?—A. I believe the mining was here first.

Q. What do you think can be done to obviate these difficulties?—A. It is hard to tell what can be done. I have no plan to suggest other than that proposed by the gentleman who has just spoken. The rivers can be dammed and then thus keep the larger portion of the large material up in the mountains and take the slickings onto the tule land. This sediment can be carried off in the way canals are made, and I think it

would be a benefit to the land. The slickings grow good crops of grain, clover, and grass.

Q. What value do the foot-hills have for agricultural purposes?—A. There is a little portion of it that grows good grapes, but the larger portion of it is not worth anything at all for agricultural purposes. There are a great many little places where the *rancheros* can scarcely make a living on them. They raise a little wheat in the foothills; they raise it for hay. I do not think that any one raises it for threshing purposes.

Some years ago there was some vineyards planted out here, but they didn't seem to pay.

Q. Do you raise much fruit here?—A. Yes, they raise considerable fruit here—apples, pears, grapes, plums, peaches, &c. I think these lands are better for fruit than anything else.

Q. What do you think of the policy of continuing the present mineral reservation?—A. I think it is a very good policy, the best that can be done.

Q. What is your judgment of the advisability of shortening the time in which a man can complete his title to placer land?—A. I think it would be a good idea to shorten the time; there would not then be so much litigation. If the time was shortened it would not then hang fire so long, and the land would not be held without development, and it would serve to check speculation also.

Testimony of Edward F. Taylor, register United States land office at Sacramento, Cal.

LAND OFFICE AT SACRAMENTO,
September 30, 1879.

I have been connected with land business for ten years as land clerk, attorney, and register. The lands undisposed of in the Sacramento district are generally mineral in character, interspersed with strips of agricultural lands. I think but a very small portion of them are really mineral in character, though reserved as such. I do not think it is expedient to withdraw large bodies of land as mineral, as tending to retard the settlement of the country without corresponding benefit to mineral interests. The expense thrown upon an agricultural claimant in disproving the mineral character of a piece of land is, on an average, $25; that is aside from making any payments for the land and aside from the attorney's fees that may be involved. In an ordinary pre-emption case I suppose $25 would cover the expense, and in the homestead case probably $40 or $45.

Question. What would make the difference between the pre-emption and homestead cases?—Answer. I include the fee paid in the homestead case, which is larger.

Q. I am referring to the additional expense thrown upon a man by reason of his having to prove the non-mineral character of a piece of land. How much would that be?—A. I presume it would be about $10. The expense depends mainly upon the number of witnesses and the amount of testimony. There are a great many controversies as to the character of the land in my district, and in all of them the agricultural claimant has to take the burden of proof. In my judgment the general tendency of the law has been to retard the taking of government lands. I think it should be made as fully incumbent upon the mineral applicant to prove the character of his land as upon the agricultural claimant, and that some provision of law should be made by which he should make his proof, else his application should expire by limitation. I am speaking of the mode of disposing of mineral, or so-called mineral, lands. If nobody applied for a tract reserved as mineral, it would be good policy to allow an agricultural claimant to give notice by publication that he would make proof and payment at the land office; and if there were no adverse claimants, then to dispose of it to the agricultural claimant. If it was afterward discovered that the land was mineral, I do not think that the United States should be permitted to dispute that title. If it turned out that the man knew the land was mineral, that would be another matter, because, if he knew that it was mineral land in entering it as agricultural land and making the proof required by the law, he obtained it fraudulently; but I would not require as specific proof in reference to the character of the land in cases where there was no contest as in other cases. I believe that were land so disposed of in either manner it would be of advantage to the government. I do not understand why it should make a difference how I obtained a tract of land if I make the required proof and payment. If the land was not known to be mineral, and there were no mines existing upon it, and none had been discovered, and I was using that land for agricultural purposes and I should discover a mine upon it, I think I would use that land more judiciously than one who should buy a small part of it for mineral purposes and leave the rest to go to waste. It would be well to adopt some rule of law which would fix the rights of such parties as against discoverers of mineral. My idea is, and has always been, that any tract of land that was not fully established as mineral in character should be disposed

of as agricultural land, and where a party applied for it as agricultural land, and his proof that no mines existed upon it and that no discoveries had been made upon it was accepted by the government, no subsequent discovery of mineral after the entry had been made should militate against him unless the proof was proven to be false.

In reply to the question whether—in view of the fact that in making surveys instructions require that a deputy should declare the character of the land in his field-notes, and yet, after he has returned the survey and the land is classed as agricultural lands, the present practice allows anybody to dispute that and to introduce *ex-parte* testimony of its being wrong, by which the character of the land is never settled—it would not be better for the government to settle the question of character before offering the lands as agricultural, and that they should forever, to all intents and purposes, belong to the classes then designated, I do not think that would be the proper way, because a surveyor might go into the field, examine lands, and make his returns and a long time elapse before any application was made for that land for any purpose whatever, and in the mean time there might be a discovery of mineral made upon it.

Q. Suppose there were, what harm would that do?—A. Let parties then make their application for it as mineral lands and show it to be mineral in character. Of course in this district, where nearly all the lands undisposed of are regarded as mineral, there is a very small portion of them really mineral; but so long as there is a definite manner in which the agricultural character of them shall be established, the agricultural claimant who makes an application and makes an entry of such land would never know whether he is to become possessed of it until he receives his patent.

Q. Suppose, in making a survey, the government does make a determination of the character of the land, would not that be better than allowing subsequent disputes?—A. I think that would be better than it is now. Allow any man who might desire to make an entry of a tract of land to make the entry, but only of that character of land previously established by the government. I think that would work very well. When a patent is issued it should be given as against subsequent discovery. I think that the custom of establishing mining districts under local laws and regulations should be abolished and all mining in this country carried on under one United States law executed by United States officials. I believe this advisable, because in a great many instances it is impossible to say what the local laws are, and in a great many mining districts there are no laws except such as are recognized by miners as custom. There are no written laws, and it would be very desirable in making an entry of mineral lands or noting the discovery of a mine that it should be located under United States law; and then if an owner is afterward required to show a chain of title, he should only be required to show it back to the original locator under the United States law. I would require a notice, allow whatever be deemed best as to quantity, and let that be the basis of a chain of title to bind that land. I do not mean this should be done without regard to locations that have already been made in districts that have written laws and regulations. Such should be maintained. As regards the local laws and customs under which mining is now conducted, I think there are objections against the continuance of that system by reason of the loss and destruction of records or opportunities for their manipulation, which are afforded by the loose and irregular manner in which they are now kept. This would be corrected by commencing with the United States land officers in the same manner as is now done where agricultural lands are involved. I would abolish all recording of mineral claims under any local customs, rules, or regulations, and by law make it imperative that the quantity of mineral land applied for should be a legal subdivision. I would make lode claims in this district by legal subdivisions.

Q. After a man had made a mineral location by legal subdivision, would you allow him to follow his vein outside of the land, or would you require him to confine his operations entirely within the vertical sides of his own tract?—A. I scarcely know about that. If a 40-acre tract is entered as a lode claim and the forty acres adjoining is an agricultural claim and the lode was found to have penetrated the agricultural claim below the surface, I think he should be allowed to follow it, but if both tracts are entered as mineral, I think if the lode goes on to the second he could hardly claim the privilege of following it there. So far as my judgment goes, no injury would result from bounding the side lines of mines in this country, as their end lines are now bounded. I do not remember the depth to which mines are carried in this country. There are mines here that have reached a great depth, but I do not remember the exact depth of any of them. I think, if the present system of lode claims is continued, it would be a good idea to require locators to commence by an official survey of their proposed claims, the surveyor being prohibited from making any survey which would overlap one already on record. I think that the best plan for doing away with litigation that could be adopted. I suppose the details of such a survey and its cost could be fixed by statute as well as any other fee. It would be more expensive in some instances than in others. If the application for a mineral survey was commenced by an official survey, I think the proper way would be to file the survey with the surveyor-

general and require him to prepare a diagram showing its location and relation to the public surveys, in the same manner as he now does in some cases, and require that to be filed, immediately upon the survey being reported, in the local office of the district in which that claim is situated; and I think it would be best to make it the duty of the surveyor-general to furnish the local office with an amended plat showing just where that claim was located upon the township plat, and I suppose he should give the same kind of notice at Washington. That would not require any correction of the original plat; the amended plat, showing the location upon any certain section or subdivision of land when compared with the original plat, would show the changes, and the diagram could be attached to those original plats, in many instances, instead of the amended plat. Or he should be required to furnish immediately diagrams of the section and afterward furnish an amended plat, showing all of the locations in that particular township or range, every three or six months, keeping one extended plat in his own office. It is true that there would then be a greater or less period of time between the finding of the claim and the date when the official survey could be made. As it is now, if he complies with the law he marks his claim off on the ground as he locates it; then, if there is any other applicant for the same tract or claim it cannot be otherwise than that he would have notice of that fact when the adverse claim comes up.

Q. I mean the man who is the first discoverer. How would you protect that man against subsequent parties up to the period when he gets a survey made?—A. In that instance it would be best that he should give notice in some place of his having taken up a claim. Under the present system he protects himself by filing with the mining recorder.

Q. Why not make it his duty, after making a discovery, to ascertain himself in what legal subdivision that land is located, and file a notice of intention to claim it?—A. Suppose he has gone out a hundred miles in the wilderness and a long way ahead of surveys, under the present law no one could make an application for patent until the survey is made.

Q. I am speaking of the acquisition of possessory rights. You do not have to make a survey for that?—A. No. I think if he wants the land for mining purposes he should be required to take some steps to procure it, and there should be a time within which he alone should have the right to procure title.

Q. Under the present system, as a matter of fact, does a man when he takes up a possessory claim do anything more than file his notice of location with the mining recorder and allege that he has discovered a lode? Is there any other evidence of that fact except his say-so?—A. No, sir, not until he makes application for his patent. I think, therefore, it would be well to provide that a discoverer should take up his claim in such manner as to give notice to other parties of the limits of his claim until such time as he could get a survey made. That is as regards proof of the discovery of a lode, but the best evidence would be in the form of *ex-parte* testimony. If any other plan were adopted with reference to taking evidence the same character of testimony could be furnished by adverse claimants. Under the present system the existence of a lode is always assumed. A system should be devised by which that fact could always be proven, and I know of no better way to do it than to require that proof be made in the same manner as it is now required. Of course there could be a system of determining it by governmental inspection. You might make it incumbent upon him to have a United States deputy surveyor go on the ground and report whether there was actually a lode there or somewhere else, and it might be made the duty of the surveyor to do this before he made the survey applied for, and he might have instructions not to make the survey unless he actually determined the presence of mineral. I think ninety days would be a sufficient time for a man who had located a claim to show that he had a lode. He is better able within a short time to go in and prove up his claim if it is a gold-bearing lode than an agriculturist is.

There should be some period of time within which all persons who have made mineral locations should be required to come in and prove up under penalty of having their applications wiped off the books. All applications on file should be completed within a given time or should be canceled. All parties who have presented applications should have notice to come in and complete their cases within a given time, and I think that six months would be enough for all applications, and I would publish it that the principals in all applications on file, on or before a certain date after the passage of the law, were required to prove up and make payment for their lands.

In case of controversy arising in relation to mineral claims, I do not know of any reason why it should be taken out of the executive department and turned over to a court, nor of any benefit arising from such a course. Such controversies can be determined by the Land Department with more facility than they can be by a court, and I cannot conceive of any good reason why any case of that character should go into a court.

The United States should retain jurisdiction over its mineral as well as agricultural lands until it relinquishes title. I think the settlement of questions arising under the land laws would be attended with less expense to the claimants and be determined in less time by keeping them in the Land Office. I am of opinion that more substantial

justice would be done by a United States officer three thousand miles off than there would be by a local jury where there is more or less feeling. There is a certain set of men who will always testify in favor of a party belonging to their class, and there must necessarily be prejudice to some extent in the minds of a jury, and I think that if after the testimony in a case was taken it was referred to officers three thousand miles distant and who only had the cold testimony to look at, they would probably arrive at a more just conclusion than those knowing the parties. I think that the executive officers of the Land Department should be clothed with jurisdiction to see that there was a meritorious adverse case made out before it was referred to the courts at all. Such cases are frequently never reached in court and then the final patenting of the original claim must be suspended. I think the better way would be for the Land Department to have exclusive jurisdiction of all land matters.

As regards the recording of mining claims, I am clear that it would be best to substitute the jurisdiction of the United States officers from beginning to end until the patent is issued and the land reverts to private ownership.

I think it would be an improvement in the manner of disposing of public lands on which lodes are discovered if you require the discoverer to take his claim in a 40-acre tract; as it is, I know of no instance in this district where there is more than one lode or claim upon any subdivision of land. Now when a party makes application for a lode claim and it is surveyed small pieces of land are left in the subdivision probably bearing timber and no use is ever made of that fraction. The miners cut the timber and the land lies there and is that much dead loss to the government, whereas if they were required and allowed to take the entire subdivision it would not be more expensive to the miners and more profitable to the government; but if a subdivision of 20 acres would embrace the claim, and leave just one-half of the 40 acres in proper shape, I would give that; but I would fix the maximum limit and the shape in which it should be taken. Timber lands of course are protected when they pass into the hands of private parties, but there is now little or no protection for them. Under the law miners now have the privilege of going upon public lands and removing the timber for mining purposes, and the result is that all the timber is taken off a tract of land and it is then valueless and it can never be disposed of. If they were permitted to apply for it in the other way, it would all be taken. There is a great deal of timber in this district and great destruction of it. A great deal of the land is valuable for no other purpose than the timber, which consists of oak, pine, cedar, and some sugar pine in the mountains. I do not think I would be able to give or to get accurate data of the amount of lumber manufactured and exported from this district. The greater part of what is made is, however, consumed in it. The department has ruled that on mineral lands people have the right to cut timber for mining and domestic uses. The law which allows this character of timber to be taken I regard as wrong. The parties who use such timber are well able to buy it. I know both from statements made to me by parties living in the different neighborhoods and by personal observation that there is great destruction of timber in this district, and many applications have been made to my office in the interest of lumbering firms. Very many fraudulent entries have been made on this account and a number of agricultural claims have been taken up for the sole purpose of cutting and selling the timber from the land. I could not give more than a very rough estimate of these depredations but will prepare and forward a statement concerning them. My opinion is that where a party wants to enter a tract of purely timber land for the purpose of using the timber, he should be permitted to enter a section at a dollar and a quarter per acre. There might be some method prescribed to show that the tract designated was actually timber land, and notice should be given to the world that the land was claimed for its timber alone, and within a specified time after giving such notice he should be required to make payment.

I am of opinion that the placing of these timber lands in the hands of private individuals would be the best way of solving the problem of timber depredations. I think it is the only possible way in which the timber can be protected from extermination, for after passing into private ownership it would be protected and utilized. I do not think there would be many instances where lands withdrawn as mineral would be taken up as timber lands, if proper rules were established for determining whether they were timber lands or not. The people who want to purchase the timber do not generally want the land after it has been removed. It then frequently becomes good for pasturage, and might be sold by the first owners for that purpose. A good portion of it would have a value aside from the timber.

Q. In disposing of timber lands generally, in the midst of which mining camps are located, the first objection to your proposition would be that under the guise of buying timber much mineral land would be acquired by dishonest parties.—A. You could avoid that by selling the timber on the land without disposing of the soil; then if there were any mineral discoveries afterwards they would be on land belonging to the United States, which could be entered as such and sold subject to the provisions of the mining laws. I do not think it would be well to dispose of timber lands chiefly valuable as such, without reservation, in view of the fact that mineral dis-

coveries are liable to be made upon them at any time; nor do I think the government should make provision for sale of alternate blocks of this timber, as such timber would be cut and removed just as it is now. If you reserve the alternate blocks and give the public an opportunity to buy the alternate blocks of timber, they would cut from the government sections under cover of their own lands, and would have greater facilities for so doing than they now have.

As far as my knowledge extends I believe that a law that would put such public lands as are not mineral on the market in this State for sale at one dollar and a quarter or two and a half an acre would meet the approval of the community—that is, I mean such as are not timber or mineral, but such as should be applicable to entry under the homestead and pre-emption laws. I think such a law would be popular for agricultural and pasturage lands. I do not think that much valuable timber land has been entered under the homestead and pre-emption laws by perjury; I think as a general thing such entries are actually for homestead purposes.

We have on file in this office over 7,000 declaratory statements, of which some 3,300 have been perfected by making payments in the authorized manner. In some cases five or six applications have been filed for the same tract of land that was ultimately entered by one of the parties as a pre-emption claim. I do not know what the proportion of that kind would be, but I think a majority of applications for surveyed lands have been covered by other similar applications. I do not know whether it would be expedient to repeal the pre-emption law and leave only the homestead act. My opinion is it would be well to have some other method of disposing of the land besides the homestead act, because most parties who enter land under the pre-emption law also enter a tract as a homestead, and in that way they get 320 acres of land, which is not too much. That has been the custom of the actual settlers in this district. They commence with their pre-emption first; file their claim to a tract of land, prove up, and make payments. They then make a settlement under the homestead law, and as they respect each other's rights they generally get adjoining land. If the pre-emption law were abolished the settler could only claim title to 160 acres of land, and he could have a larger quantity of the kind than he could obtain in this State. I think 160 acres of land of the character found here is not sufficient for a man, and I would give him more, either by keeping up these two laws or by consolidating the two and giving him 320 at once. I think this because if the 320 acres of land were divided in two tracts, as he might take them now, he would probably be able to secure a larger percentage than if he were compelled to take it all in one block. He might get 160 acres of reasonably good land by picking it in the former way, while he could not by taking one solid piece.

I do not think there has been one timber-culture entry in this office where the person entering has made any effort to complete the entry. He can make such an entry and hold others off the land for seven years. I think there have only been five desert-land entries.

I do not know of any limit to the location of additional homestead scrip so long as a man's pocket-book holds out. A man can enter a homestead and pre-emption and then he can make a desert entry, and after that he can locate as much additional scrip as he is able to buy.

Testimony of J. W. Tripp, San Francisco, Cal.

J. W. TRIPP, of San Francisco, testified October 7:

Agriculture can be carried on successfully without irrigation north of Fresno County; but in Fresno, Tulare, and Kern Counties it cannot be carried on without irrigation. On the foot-hills of the Sierra Nevadas and of the Coast Range irrigation is possible. The Sierra Nevada lands, where the timber grows, are supposed to be the best lands for vineyards and fruits. They are at present only available for the timber that is upon them. These lands where the vines and fruits can be cultivated are the pine lands back in the higher Sierras. The oak lands in the foot-hills are grain lands. The moisture falls in the high mountains and seeps down and keeps them damp, thus enabling settlers to raise a crop of wheat and cereals of some kind. In the country I speak of there has been no destruction of the timber. I do not think the fires or depredations have injured or interfered with it at all. There is only one saw-mill at the head of King's River. The destruction is unappreciable there. I don't think there has been a great deal of damage done to the large timber on account of the fires. It is an extraordinary fire that kills the timber.

Question. What method of disposing of this timber would be best for the purpose of utilizing the timber for industrial purposes and preserving the timber?—Answer. The only way to preserve the timber is to dispose of it in large quantities, and let a man pre-empt it, inducing the people to locate these lands as timber lands, to be always kept as such. When one tree is cut let them plant another. If a man has a

large tract of timber he will preserve it; but if a man goes on 160 acres and puts a mill there he will cut off the timber and sell it, and when the timber is all cut off this tract he will pre-empt another tract; and thus they never preserve the timber. The only way to preserve the timber lands is to allow them to be held in large tracts, and to allow a man to fence his tract and protect it by law. He will then take care of his timber and see that there are no fires, and will always keep the trees there; but if a man has but 160 acres there is nothing that he can do but sell the timber off it as soon as possible. There is not a man to my knowledge who for twenty years past has left a foot of timber on the lands that he has located for the timber. It becomes a speculation the same as the mines. He takes up a timber claim just as he takes up a mining claim, to get what he can out of it and move away from it. The farmers are too far away from their timber for it to be of any use to them. A man living in the valley would have no use for the timber away up in the mountains. If he cut it he would sell it before twenty-four hours, because he could buy his timber more cheaply, sawed into lumber, than he could get it off himself. It is too difficult of access and too complicated a subject for a man whose business is farming.

Q. How can the irrigable lands be best taken up by actual settlers?—A. The best way to acquire homes for men who irrigate lands is for them to be supplied with water. Twenty acres of irrigable land will support any man that has a family. He can get a crop every sixty days. In Tulare County he can get in that time a good crop off it if he can get the water. I consider that the desert-land act, so called, was one of the best laws that was ever enacted. Under that law he gets his land for 25 cents per acre.

Q. Why cannot a poor man make a homestead on land capable of irrigation?—A. Because he cannot get at the water. It takes combined capital to take out the water. It will cost to water the land of the San Joaquin Valley for irrigating on a large scale above $1 per acre. A main canal from King's River into Tulare County can be built for $100,000 that will irrigate 100,000 acres of land. The settlers can then make their distributing ditches. But the poor man cannot take out this water unless by co-operation. Much capital is necessary to redeem the irrigable lands, because to carry water it requires a canal 100 feet wide and 4 feet deep, sufficient to irrigate 1,000 acres every twenty-four hours. Every foot of that land when overflowed insures a crop without failure. That is in Kern River country. In the San Joaquin and Fresno Counties the moisture is deeper, and there it requires more water to fill up the ground. In Tulare County one foot of water will fill up the ground. With this one foot the water will soak into the land—it will soak in and be good for one year. Twelve inches of water will do to soak into an acre of this land, and the natural moisture is sufficient to produce good crops for one year.

Q. By what system can homes be made upon the pastoral lands, so that those lands can be utilized?—A. I do not consider the lands you speak of worth anything at all. They ought to be given away to any man who will take them. In the first place, there is no grass on them and but little wood. Where they have 6 inches of water alfileria grass grows, which will last sheep for a short time, and then it is entirely gone. It is of no use for feeding sheep. These lands are good for nothing without water. I have been in the Snake River country and understand all that land thoroughly. There is a sage-brush that grows with bunch-grass, and it is the finest feed we have. It is the white sage. It makes the finest pasture land that there is. These lands, where they cannot be irrigated, are good for nothing except for pasturage. I would have the government sell these lands and get them into the possession of any man who would utilize them, in tracts of 1,000 acres. That would support, the year round, 250 head of cattle. The bunch-grass is killed out by feeding and trampling on it.

Q. Applied to the pasturage lands of this country generally, how much land did you say ought to be contained in a pasturage homestead, taking it on an average?—A. In this country it is very hard to tell. It is different here from what it is in some other portions of the country, which are far superior. I think a man with a family with 1,000 acres would be able to live well on Snake River. In the southern part of Nevada I should think not less than 5,000 acres would do. In Utah, when I was there, the country looked pretty well, and I should think it compared favorably with Southern Nevada. I should say 5,000 acres there. I was in these different countries when they were better than they are now.

Q. Are you not building ditches?—A. I am.

Q. State just what you think about irrigation and water rights—how the present system could be changed?—A. Take it in the San Joaquin Valley. The largest quantities of water flow in King's River and Kern River from April 1 till about July. Then there is sufficient water in these rivers to water every foot of land in the Joaquin Valley, which is about 6,000,000 acres. Enough water runs to waste in these streams to water the whole area. I would suggest that the United States Government build main canals, and put up reservoirs in the foot-hills and mountains and hold this water back, and take it out on each side of the river and distribute it on the lands. This would reclaim the irrigable lands.

Q. If these lands are reclaimed what would you charge for them?—A. I should tax every man $1 per acre for irrigating his land. Under the present law you cannot deprive a man of his water if he pays his water rent. The principle of California business is to corner everything. I would suggest that the man who lives nearest to the canal should first have his supply of water; and I never would run the water any distance before commencing to put it on the land, for if you do the consequence will be that one-half of it will be wasted. As soon as they get the water to the surface and flood the country right and left then you might let the water run a long distance. The canal companies entirely control the water. I am president of the Muscle Shell Slough Irrigating Company. We distribute the water on either side. I will illustrate: We run our branch ditches within two miles of a man who had bored his well and was within 15 feet of water. We run a ditch past him 30 feet wide and 4 feet deep, and filled his well up within 2½ feet of the surface. We have utilized the labor of all the farmers. We give them water, and let them pay for it in labor.

Q. Is there any law in this State in regard to the distribution of water?—A. There is no statute upon the subject in this State; heretofore there has been no trouble. We are the only canal that has put water on to the land. We don't own one foot of land.

Q. Your idea of building these ditches is, to tax the persons adjacent to them, the same as in any other public improvement; you would tax the lands that lie adjacent to the ditches?—A. That is the only way that it can be done; it can be done only by aggregated capital. It is right that the government should own the water—it should be the water of the United States; then it can be taken in such directions as will best benefit the country.

Q. Should the right to the land and the right to the water be separate?—A. It should become two independent properties; that is the only way of satisfying settlers. Sometimes the supply of moisture carried through the soil will be sufficient and they will not want the water, and if you tax a settler for what he does not use you don't come up to his idea of government. Men would rather take the water and pay for it as they use it. One time a man wants to have it and another he does not.

Q. What is the effect of water in irrigation?—A. That depends upon the soil. When you have to run your water over the land it washes the soil away, but where you get a seepage it enriches the land. It becomes richer from using the water. As a matter of fact, it will require from year to year less water to irrigate the land. It will undoubtedly extend the area of irrigation all the time. The national government could better devise and control a system of irrigation than the States and Territories. If the government decided to carry on a system of irrigation, they could buy out the present owners of water rights.

Q. Are not the river channels filled up by tailings?—A. I am an hydraulic miner, and I say that the tailings and *débris* are more injurious to the country and farming lands than all the gold that is taken out is worth. If this national system of irrigation was carried on, it would be a part of it to stop this depositing of tailings in the streams. I opened those mines in Dutch Flat, and the lands and timber that have been destroyed there would have produced to-day in agriculture more than all the gold that has been taken out. The land from Nevada City to Yuba City would have produced more than all the gold that has been taken out of it. The soil was from 2 to 4 feet deep, and there were thousands of acres of it. There is a great deal of trouble arising out of the imperfect manner in which mining claims are segregated from the public domain, and I believe there is a great deal of land held in this State under the placer act. I do not believe in disposing of the mineral lands. I believe in allowing them to take the mineral out, but in the government's holding the title to the land. There are millions of acres in this country useless and idle, which will never be utilized until some system of irrigation is inaugurated, if it can be done and you can get the people to agree on a method of doing it. It is absolutely necessary, in my estimation, to settle it.

Q. Do you or do you not think that the timber question ought to be placed under the control of the district land offices? If the government does not decide to sell it, ought it not to license timber men to go and take the timber?—A. Yes, sir; I think it ought. It would make a man honest, where now the laws tend to make him a dishonest man. I am opposed to hydraulic mining and washing down of the hills into the rivers and destroying the valleys. I would protect the valleys and the rivers and the lands. If the government would bring water to these dry lands, 40 acres would be as much as a man would want.

Q. Has a corporation a right to withhold water from any man who pays his rent, as long as it is running in the ditches?—A. I do not think it has; I do not think there is any danger in that respect.

Mr. B. B. REDDING. It is a very terrible thing in a republican form of government to place in the hands of individuals the power to shut off water from a man's land without judicial process. Therefore the future interests of the State require that the ownership of the land should go with the ownership of the water.

Mr. TRIPP. I can only illustrate it in this way: If a man jumps on a railroad train and refuses to pay his fare he is put off, and if he comes again with his ticket you allow him to ride. The power does not exist to allow us to refuse that man any water when he pays his water tax. The new constitution says the water is for the use of the land, and I have no doubt but what the constitution will enforce this. We run our ditches for the public benefit, and let every man take the water.

Q. In the future, when the water has been extended as far as it can be extended, won't there be danger of discrimination and favoritism, and should that power exist in any corporation or individual? Would it not be better to have the water and the land go together? Should not the ownership of the land and water be inseparable?—A. No, I do not think it should. I have been in this business about five years, and I do not think I ever knew a demand for water to be greater than the supply in the canals. The amount of water sold should never be in excess of the supplying capacity of the canals. I think the United States should control the water, and they should use these ditches to the best advantage to distribute the water, and tax the land for it.

Q. If you keep up this national system of water, would it not be a system of interference that would not be tolerated by the people? Would you not sell the water with the land?—A. You cannot sell the water with the land. It is impossible, and no man will buy the water with the land. The government cannot insure him the water when he buys it. It is the water that sells these arid lands. All a man wants to know is that he can use the water. He does not want to own it, but to be sure of having it, and not be under the terror of anybody's whim about it. If you give a man ownership of the water, he would own all the land in the country. We have water enough for everybody.

SAN FRANCISCO, *October* 8, 1879.

I have been well acquainted in Alaska. I was last there in 1862. I was formerly on one of the Hudson Bay steamers, but when last there it was with a party of prospectors, and I went inland more than 200 miles, following the sources of the principal rivers while searching for gold. We found it in all the streams, and sometimes we found pockets that panned out as high as nine ounces a day to the rocker. This was in August, 1862. The summer commences there about July, and lasts about two months. I stopped mining because the diggings were shallow, and it appears the gold comes down with the floods and settles on top of the bars. A man could work out 300 feet in twenty-four hours. The mining is of about the same character as it is on the Columbia River. We stopped because the ground was thin and it was hard to find places where mining would pay. We went as far toward the sources of the streams as our provisions would allow, and found the same general character of formation all the way up.

The timber is such as is found around Caldwell, and grows slowly. There is a kind of pine, that never grows more than six inches in diameter. We found black spruce, out of which we made rocker bars. One tree would not make more than four bars. We saw plenty of cariboo, but no elk. Moose and bear and grouse were plenty. There are long and open valleys west of the Cascades.

In August, on Carpenter's Bar, 175 miles from the mouth of the Stekine River, the ground was frozen six inches deep, and we had to build fires to thaw the ground sufficiently to sow radishes and turnips. The soil was fertile, and cottonwoods would grow there. In September our water-buckets, sitting outside the tent, froze solid.

The waters of Alaska abound in all varieties of fish, salmon principally, and there are cod and halibut, and what is called sea trout are frequently seen in schools. Their meat is very white, and the skin is like that of an eel. The natives prefer those fish to any others they have there. There is another little fish up there that grows about six inches. The Indians cut the fir boughs and sink them in the water, and they spawn on the boughs and the Indians eat the spawn, and they procure an oil from the fish themselves that they use much.

There are plenty of Indians in that country, and generally they are better looking than ours, and are strong and stout. There is no agriculture to amount to anything in Alaska, and even on the islands the potato only grows about as large as a walnut. At Fort Simpson there is some high grass that is quite good for grazing, but nothing else will grow there. There are no seals up the great rivers; they are only found on the coast. From my experience while in Alaska, I am of opinion that it will compare favorably with what I have heard about Siberia as a mining country. It is only at certain seasons that people can mine there. If they find quartz mines they cannot work them through the winter. I do not think the government made a bad investment in acquiring this territory, and I think there may be hereafter as good mines found there as on the Columbia. It is worth all we paid for it. I do not think there is any use in extending any system of land laws to that country. The best of the placer mines are in British Columbia. Those in our possessions are of little value. Our principal find of gold was in what is called New Caledonia.

The timber in the valleys we saw near the coast is of no use for timber purposes, and can only be used for fire-wood.

The whole population of Alaska, including animals, live off the water, because they cannot get a living on the land. Even the bears come out of the hills and live on the clams they find. I have seen them sitting on the banks of the rivers waiting for the tide to get low so as to get at the clams, which they get up with their paws and break in their mouths. That is on the mainland. The same thing is true of the hogs on Puget Sound, and there almost every hog would have two or three crows sitting on his back waiting for him to get at the clam and as soon as it was rooted out a crow would snatch it, fly up into the air, drop it on a rock to break it, and then eat it; so that even the hogs have hard work getting a living. The natives all live on fish and depend upon the waters for their main sustenance.

I think that Alaska should be left just as the Hudson Bay Company left it. It should be left for the fur animals and for the fisheries. All that is needed is a military station at Wrangle. There should be revenue-cutters stationed on the coast to prevent the continuous introduction of whisky among the Indians and that should be made a penal offense. I think it is the worst policy in the world for the government of the United States to lease out in that country any particular trade like the fur-seal fishery. The Hudson Bay Company lost money because they could not compete with people who bought skins for whisky, of which the Indians in that country are inordinately fond. When unstimulated by liquor they are industrious, and are well enough behaved if they are let alone.

The coast Indians control the business of trading in furs obtained from animals in the interior. They are the middlemen between the white trader and the interior Indians, whom they will not let come down to the coast at all for any purpose whatever.

Testimony of William Schuhman, of San Francisco, Cal.

WILLIAM SCHUHMAN, of San Leandro, Cal., testified at San Francisco, October 11, as follows:

From information and from facts also, we find that the boundary lines of Spanish grants have in all cases run beyond their first confirmation; that they have run over their original boundaries to a very great extent—over a mile or mile and a half in many cases. We consider that that extra land ought to be liable to pre-emption and settlement. These lands are now withheld from actual settlement by the grant lines being extended over them. The fault arises from the fact that the Spanish grantees had to pay for their own surveys, and they took the surveyor on the ground which they selected and chose for themselves. The Commissioner would report under that survey and they got a patent, of course, covering the ground they wanted. Now, we are very well satisfied that much land was included within these grants that does not belong to them but belongs to the United States, and we wish that this matter should be adjusted at the expense of the United States, and that this land should be set aside for settlement under the law. In this neighborhood we have discovered some lodes or ledges (quartz ledges) containing pure gold, some silver, and some cinnabar. In proof of this we can show certificates of assays that were made from mineral taken from this land which we claim to be government land. In one case ore yielded 58 pounds of cinnabar to the ton, and in another case, by three different assayers, the returns from the ore were $25 to $30 in silver, and from $1.50 to $2.50 in gold. The settlers are anxious to locate on these lands, and they have no show unless the government takes it upon itself to have the surveys adjusted. The government should do that and not wait for the claimants themselves to have their own lands surveyed. The delay in having these claims settled is very injurious to the prosperity of the State and of the United States.

Testimony of Theo. Wagner, United States surveyor-general, San Francisco, Cal.

The questions to which the following answers are given will be found on sheet facing page 1.

UNITED STATES SURVEYOR-GENERAL'S OFFICE,
San Francisco, Cal., November 14, 1879.

To the Public Land Commission, Washington, D. C.:

GENTLEMEN: In compliance with your request I submit the following replies to questions submitted by you:

1. My name is Theodore Wagner; residence, San Francisco, Cal.; occupation, United States surveyor-general for the district of California.

2. About six years.

4. As a surveyor and attorney I have been engaged over ten years in surveying lands and practicing before the courts, making land matters a specialty.

5. In contested cases from one to eight years; in uncontested cases from six months to three years.

6. I have. Contests by reason of requiring the evidence to be reduced to writing are expensive. There is no compulsory process for the attendance of witnesses, which frequently results practically in a denial of a hearing at all. Questions of fact ought in all cases to be finally settled by the officer before whom the hearing is had. On paper the evidence of the greatest of rogues looks as well as that of a most reliable man, and witnesses equally reliable often differ as to facts. The officer, seeing the witness, watching his manner of testifying, and perceiving the relative opportunities of the witnesses for knowing the facts, is alone competent to judge of the facts from the evidence. Such matters are not susceptible of explanation or elucidation in the report of the officer holding the hearing.

The register and receiver should be required in contested cases to report findings upon all the facts in dispute, and those findings should be final; or appeal might be allowed upon bills of exception prepared under the same rules and in the same manner as in the courts.

In contested cases there might also be required a complaint, under oath, setting forth the specific grounds of the contest, and the defendant should be required to answer within a certain time, under oath, denying the allegations of the complaint and setting forth his defense. This will bring the parties to a certain issue and will inform them as to what they have to meet. As it now is, both claimant and contestant must come prepared to meet every imaginable defense or allegation, and must bring witnesses as to matters which are not but might be disputed. For instance, a homestead claimant may have been away from his claim a year; contest is entered, and upon a day set for hearing the claimant appears and in defense sets up that he was sick at some city hundreds of miles away; this may be untrue, but the result is that the contestant must ask for a continuance to show it is untrue. The fact of absence having been admitted by the claimant would have saved the contestant the expense of bringing witnesses to prove it.

If the practice were changed as here suggested it would frequently be unnecessary to take evidence at all; for, complaint and answer being under oath, in many cases where there are no good grounds for a contest the same would be dismissed upon the facts admitted or disclosed in the pleadings, or a forfeiture and cancellation of entry would be ordered upon the admission in the answer. Frequently the party, knowing he had no defense, would not answer at all.

The evils here pointed out are as much faults of administration as faults of law. Except in the matter of clothing the register and receiver with power to compel the attendance of witnesses, the changes here suggested could be accomplished by regulations of the department.

In many cases settlers have located upon lands within the reserved limits of a railroad grant, the alternate sections of public land within such limits being held at the double minimum price of $2.50 per acre, by reason of such reservation.

Frequently in building the roads the line originally adopted is departed from so that the lands for which the settlers paid $2.50 per acre are as much as 100 miles away from the road on account of which the increased price was paid. It was obviously the *intention* of the act of Congress, approved March 3, 1875, (18 Stat. p. 519) to include cases of this kind, but the department has ruled otherwise. To do justice to those people I would suggest an amendment by inserting after the words "for failure to build said railroad" the words "or if by change of route such lands are kept without the limits of the grant to such road."

In this State, under its laws, persons who fence in and occupy public lands are protected in their possession as against all others having no better title. Under these laws it frequently occurs that a single individual is able to hold as against others seeking homes large tracts of thousands of acres of desirable land simply by fencing, using, and occupying it.

Under the laws regulating the disposition of the public lands of the United States as interpreted in this connection by a recent decision of the United States Supreme Court, it is practically impossible for any person to obtain a title to lands thus in the actual possession of another. I therefore suggest the necessity of Congressional legislation to the effect that possession of public lands shall not prevent their acquisition under pre-emption or homestead laws, and further legislation providing some summary process by which pre-emption and homestead claimants may obtain possession of lands which are thus occupied without right or title other than possession.

Persons who in search of homes have settled upon lands granted to railroad companies years ago are desirous of acquiring title to the land although the roads have not been built, and in some instances there is no immediate prospect of it. To prevent from acquiring such title retards the settlement of the country, and has a pernicious

effect by unsettling the habits of the people, making nomads of them. These people are willing to pay the railroad companies a consideration proportionate to the value of the land to relinquish their rights thereto if by so doing they could secure the privlege of obtaining the land under the United States laws. If this could be done the proceeds might be held in trust by the United States until the road is built or the question has been finally disposed of. Some provision of this kind would be productive of much benefit to the country at large while satisfying the reasonable demands of the settlers, and would not interfere with any railroad companies, but would rather assist them with means to build their roads.

Section 2401 of the Revised Statutes, which provides for surveys under the special-deposit system, excepts mineral lands from its provisions. At the time this law was enacted, viz., May 30, 1862, the law provided that only township lines should be extended over mineral lands, and the clause excepting mineral lands from the provisions of this act was obviously merely intended to bring that provision into harmony with laws existing at that time. The law in this respect was subsequently changed, however, by the act of July 9, 1870 (sec. 2406, R. S.), which specifically provided that the public surveys should extend over *all* mineral lands.

As surveys under the special-deposit system are public and not private surveys, the act of July 9, 1870, in effect and by necessary implication, repealed the restrictive clause of the act of May 30, 1862, or section 2401 of the Revised Statutes.

Surveys under the special-deposit system are made under the same laws and regulations as other public surveys, the difference in the systems being in the mode of providing for the payment of the cost of the work.

The circular instructions of August 8, 1870, sixth subdivision, contain the following:

"By the sixteenth section the interdict placed by the act of March 3, 1853, that none other than township lines shall be surveyed when the lands are mineral, is repealed. This provision of law being referable to surveys in California only, the extension of the lines of future surveys over the lands mentioned in this section applies exclusively to that State. The requirements, however, that nothing herein contained shall require the survey of useless lands is a principle of general application, and surveyors-general will refrain from extending the lines of public surveys over such waste lands, *which are considered to be those covered with alkali to a depth calculated to prevent the growing of crops, moving sand, or other sandy plains of great extent, and abrupt or rocky mountains not known to contain mineral deposits.*"

In none of the mining districts are all of the lands mineral, while the location of the districts at points remote from railroads and in positions reached only through expensive means of transportation renders non-mineral lands in the vicinity much more valuable in point of returns on product than lands in more favored localities, to which in point of amount of product they cannot be compared. It would be manifest injustice, and surely could not have been contemplated by the framers of the law, to deny an agricultural settler in a mineral district the privilege so freely granted the settlers in non-mineral districts, that of having his land surveyed that he may secure title thereto.

Although nearly all the lands in this district might be claimed as mineral, in but few places is the land more valuable for mineral than for agricultural purposes.

The fourth, fifth, and sixth subdivisions of the circular of instructions of May 6, 1871, relating to the segregation of agricultural from mineral lands, recognize the rights and equities of agricultural claimants and the facts stated herein, and, furthermore, provide the ways and means for the said claimants to prove the non-mineral character of the tracts they claim. Should it be held that the restriction in section 2401 of the Revised Statutes relative to mineral lands is not repealed by section 2406 of the Revised Statutes, but is still in force, I would recommend that the attention of Congress be called thereto with a view to the removal of said restrictive clause by legislation.

I respectfully recommend that the provisions of section 2401 of the Revised Statutes be extended to persons entitled to enter lands under other laws than the pre-emption and homestead laws, there being in force in this district in addition to these laws the act of March 3, 1877, providing for the disposition of desert lands, and the act of June 3, 1878, providing for the disposition of lands chiefly valuable for timber.

In the neighborhood of mines enormous quantities of timber are used, and unless surveyed there are no adequate means of protecting the timber lands from spoliation of all that renders them of value. The timber lands should be surveyed, so that persons entitled to enter them under the law may obtain title. There is no danger that non-resident speculators might monopolize such land under the law providing for the sale of timber lands, as, aside from the safeguards in said law, they would be no better able to protect the lands from spoliation than the government is.

In order that all reasonable facilities may be extended to persons who wish to legally acquire title to such lands as they may be entitled to under the law the provisions of section 2401 of the Revised Statutes should be extended to all legal claimants of the

different lands, or more ample appropriations for surveys be provided by Congress. I would also suggest that the word "persons" be substituted in lieu of "settlers," in the clause "settlers in any township," in section 2401 Revised Statutes.

The grazing interest should be provided for by authorizing conditional leases of public land containing the proviso that the lease shall not be held to withdraw such land from *bona-fide* cultivation and settlement under the homestead and pre-emption laws. Such a course, while satisfying the grazing interests, would preserve such portions of the public domain as may be found to be susceptible of settlement and cultivation for those purposes; or grazing homesteads might be provided for with advantage by dividing grazing lands into two classes—the first class to be disposed of in tracts of 640 acres; the second in tracts of 2,560 acres; for the reason that in this district 640 acres of grazing land, if not arid or covered with sage-brush, are equal to 2,560 acres, or four sections, of lands of the latter class. The price of the first class should be $1.25 per acre; that of the second class 25 cents per acre.

9. While I do not believe that lands can be better classified than they now are, I believe that too little attention is paid to the classifications now made by the surveyors. There are about 40,000,000 acres of land unsurveyed in this district, nearly all of which should be surveyed without restrictions as to character. Grazing and other lands are so intermingled that it is practically impossible to properly draw the line of demarkation. Under the present restrictions upon the classes of lands to be surveyed, small tracts of land must be left unsurveyed, thus causing the surveys to be made in a fragmentary way. There are many cases where the deputy cannot pursue his examination further than to the borders of the tract which falls within the restriction, while there are small tracts within the tracts so excluded which are valuable for agricultural and other purposes, and which might be surveyed under existing laws. The restrictions in question have not operated economically to the government in this district, as the resurveys necessitated thereby have more than offset any saving. As the rectangular system of surveys depends for proof of its correctness upon its homogeneous completion, I deem it imperatively necessary to complete the survey of the standard and meridian lines, as well as the township extension, at as early a date as practicable, in order to avoid in future the serious errors resulting from the projection of these lines little by little. The subdivision of the townships into sections may then be proceeded with as the settlement of the country demands, or as Congress may provide the means, although it is desirable that it be done at as early a date as practicable.

I believe that in the matter of economy the rectangular system of surveys, through its simplicity and perfect adaptability by means of its small legal subdivisions to all forms of topography, is the most desirable. For land-parceling purposes a more geographically accurate survey than can be obtained through the present rectangular system is neither necessary nor desirable. A system so readily understood by all classes of claimants and settlers cannot be supplanted by any so-called scientific system without opening the doors to complications and abuses as well as hungry litigants and hungrier lawyers. My experience is that the rectangular system is the best that can be devised for land-parceling purposes. It is only necessary to revert to the complications arising in the surveys of Spanish or Mexican grants to determine what a departure from the rectangular system may produce. I venture to assert that in most cases involving the settlement of the boundaries of a Mexican grant of 640 acres, in order to perfect it for patent, more legal talent is wasted, more delay occasioned, and more expense incurred than would suffice to survey a full township of perhaps equal or greater value and containing thirty-six times more area.

In those portions of the United States where the rectangular system alone prevailed but little trouble or litigation regarding boundaries will be found, and in many of them the public surveys have been long since completed, while in those districts where any other system has prevailed the surveys are not only not completed, but it is a matter not easily determined when they will be, and trouble, endless litigation, and personal violence prevail. An exact topographical survey, such as would correctly define the natural features and describe such artificial objects as are shown by the ordnance maps of Great Britain, would occupy two hundred years and cost untold millions, and a survey to be exact must observe all these requirements.

Opinion differs greatly as to the comparative merits and economy of the contract system and a system based upon salaried deputies. As a mathematical proposition, having in view only the one object of insuring the greatest accuracy, there can be no doubt that a system of salaried deputies would offer many advantages; but taking into consideration the question of economy and viewing the matter from a pratical standpoint, the contract system is certainly the better one. Other branches of the surveying service carried on under a salary system have been eminently successful so far as accuracy is concerned, but it is an open question, even with those surveys where the conditions are entirely different from land-parceling surveys, whether they could not have been executed more economically and with sufficient accuracy under the contract system. I do not believe that the land-parceling surveys can be successfully combined

with any system of scientific surveying (so-called) with advantage to either, but believe that it would be a disadvantage to both systems and objects.

The surveys in this district are so nearly completed that a salary system would not work well. The unsurveyed lands are not in large connected bodies, but are in patches all over the State. Under a salary system, if a few townships in the most northern part of the State were to be surveyed, I should be obliged to send a deputy, at great expense for transportation, supplies, and animals. The supplies might be sent from here, but the transportation for the animals would amount to more than their cost if purchased in the neighborhood of the work. Upon the completion of the work the animals would have to be sold. I would have many more details to attend to, although I cannot now, through my numerous duties, give such attention to the supervision of field work as is really desirable and necessary.

Under the contract system deputies residing in the vicinity of the lands to be surveyed usually get the contracts, thus saving expenses of transportation, &c. These men are usually engaged in the practice of their profession in that locality, and, having the necessary outfits, can do the work for about one-third less than it could be done under a salary system.

With respect to a salary system, the land-parceling surveys cannot be placed with advantage on the same footing with the Geological or Coast Survey, for the reason that while the Geological and Topographical and Coast Surveys can prearrange and prosecute their work according to a systematic and regular progression, its work must adapt itself to the erratic course of population, following the calls and wants of settlers and miners. This is especially true in the case of surveys under the special-deposit system, which surveys now amount to more than those made under appropriation in this district.

Surveys can be made as well under the contract system as under a salary system. All that is necessary is proper supervision to see that the law and instructions as they exist are faithfully executed.

While recommending a continuance of the contract system, I would suggest that a practical surveyor be appointed as inspector of surveys for each district, the appointment to be made by the surveyor-general, subject to the approval of the honorable Commissioner of the General Land Office, and his removal to be made only with the concurrence of said Commissioner. His duties should be to properly inspect all surveys before they are approved.

The rates now allowed for surveys are totally inadequate for the proper parceling of such land as remains to be surveyed in this district.

The monuments established should be of the most enduring material, and one corner at least of each township should be established by a large iron monument. At the present rates for surveys it is impossible to secure a better class of corner monuments than is now in vogue. At least 50 per cent. should be added to present rates, and the proper monuments should be required. The inspector of surveys above recommended should see that they are properly established, and legislation should be had for their protection. The monuments best adapted, in view of permanency and certainty, should, in my opinion, be made of iron, covered with tin or galvanized. They need not be large, but should be set well in the ground, with "¼ sec." or "sec. cor." cast upon them, and should be furnished by the office.

Whenever more attention is paid to the classifications made by the surveyors more care will be exercised in making such classifications. By an increase in the rates for surveys more minute examinations, descriptions, and topographical reports will be feasible, and with better monuments the surveys will be as near perfect as need be.

7. In the belt between what is called the "foot-hills" and the snow line of the Sierra, although much of the surface lies on rough mountain sides and in deep ravines, there are thousands of acres of land which could be farmed economically. The soil is remarkable for its richness, and the higher ground has a marked advantage over the foot-hills in point of moisture.

The climate of the western slope is never very severe, though the snowfall is comparatively heavy and the spring late.

There are large tracts of land which have been cut over by lumbermen and woodchoppers which could be utilized with very little labor compared with some of the lands now being cleared in the northwest. There are valleys free from timber that can be fitted for the plow for from two to three dollars per acre, with good climate, good water near the surface, and everything necessary to wealth and prosperity within the reach of the industrious. Crops can be depended on with as much certainty as in the Eastern States, and much more so than in some of the sections of the San Joaquin Valley. Much of this mountain land is adapted not alone to the raising of fruits, which are becoming quite important articles of export to the Eastern States, but to the requirements of an important factor in the prosperity of the State, the wine-growing interest, an industry rapidly assuming proportions which give promise that California will ere long rank with the foremost wine-producing countries of the world.

Most of these mountain lands are unsurveyed, and the small appropriations allowed this district, being totally inadequate to meet the requirements of the service, prevent the survey of more than a small fraction of the lands actually settled upon each year. The policy of Congress in making such limited provision for the survey of the public lands in this district has operated injuriously to the best interests of the State and the smaller neighborhood communities. In this connection, although not in strict reply to your interrogatory, I wish to submit a brief statement relative to the survey and sales of public lands in this district. All the money which may be appropriated by Congress for surveys in this State is but in the nature of a temporary outlay which in a few months is returned to the Treasury in the purchase-money paid for the lands. This is made clearer by an examination of the tabulated statements in the Land Office Report for the fiscal year ending June 30, 1878. It appears from those statements that there were 535,975.13 acres of land disposed of in this district under the various laws, and that there was paid into the Treasury for these lands during the year the sum of $456,773.92. The report gives the incidental expenses of sale as $47,135.05. It also appears that during said year there were surveyed 1,498,608.12 acres.

The appropriation for surveys in this district during that year was $24,700. There was deposited by settlers the sum of $13,190.90, and there was appropriated for the compensation of clerks and draughtsmen the sum of $10,000 (which amount through the necessities of the service was exceeded by $5,971.76), and for the salary of the surveyor-general $2,750, making an aggregate of $56,612.66. From this it would seem that the total amount expended in this district in the survey and sale and disposition of public lands during said fiscal year was $103,747.71, which deducted from the amount realized by the United States upon about one-half the quantity of land surveyed, namely $456,773.92, leaves a net surplus in the Treasury from public lands in this district for that year of $353,026.21.

The larger valleys of this district which were formerly supposed to be valuable only for grazing purposes are now being utilized to a considerable extent for the raising of cereals without irrigation, while by the aid of irrigation another portion has been made to produce not only the cereals and fruits of the temperate but of the semi-tropical zone as well. This is especially true in regard to a large portion of the San Joaquin Valley, which a few years ago could have hardly been sold on account of its presumed sterility. Much of this land has since been sold at from $5 to $10 per acre, and some portions lease at the rate of $2 per acre, the wheat raised in this valley without the aid of irrigation forming an important item in the exports of this State. The Mohave Desert, for years considered the most worthless tract of land in this district, now furnishes the basis for an important industry. It produces a scant growth of a species of cactus the fibers of which are being manufactured into a superior quality of paper and filling for mattresses. The raw material is so thinly scattered that a large amount of land is required to insure a sufficient supply for the manufacturer, while the land is not of sufficient value to justify its purchase from the government. Special and expensive machinery is required, necessitating the employment of considerable capital. In order to encourage this industry and give parties engaging in it a reasonable assurance of a sufficient supply of raw material to make the enterprise lucrative, I would recommend that Congress be requested to authorize the proper officer to lease such of these lands as may be desired for a term of years, the lease to contain the provision that the lands are leased only for that particular purpose, and nothing therein shall be considered as in any manner withdrawing the lands from settlement under the pre-emption and homestead laws.

The climate of California embraces all varieties from that of the middle temperate zone to that of the tropics. The average rainfall varies in different parts of the State from four to thirty-five inches; the average of the State at large is probably about twenty inches. The rainy season lasts from about the middle of December to the middle of April, the larger part of the rainfall being usually before February. A considerable portion of the State, including the Sacramento and San Joaquin Valleys, the lowlands along the coast, and most of the valley lands in the south half of the State have no snowfall. In the valleys of the north snow falls to a depth of from one to three feet, its average duration being from one to three months. In the extreme mountain regions the fall reaches twenty feet.

The supply of water for irrigation is varied. In some localities it is abundant, in others scarce, and some have none. Water is generally needed for irrigation from April to June, after the close of the rainy season. The necessity for irrigation, especially for cereal crops, arises from the fact that the rainfall ceases before the crops are sufficiently advanced to mature without further supply. If the soil is thoroughly saturated during the rainy season, say between February and the last of April, a fair crop is insured. A proper system of irrigation should utilize all the rainfall, first by ditches to carry the water over the land and insure a thorough wetting while the rain is falling instead of allowing it to run to the sea in the natural water-courses; and second, by constructing reservoirs to hold the surplus water until needed. With an average

rainfall four-fifths of the present cultivated area will produce the ordinary crops without irrigation. The most important object to be accomplished by irrigation in the State at large is to insure a crop in dry seasons. The productive capacity of California, to state it moderately, would be doubled by a thorough system of irrigation. As a rule irrigation is now only practiced in raising fruits and vegetables. Probably nine-tenths of the grain produced in the State is raised without artificial irrigation.

In the northern and mountain counties where the winters and late frosts prevent early sowing, and in some parts of the San Joaquin Valley, irrigation is resorted to for raising grain. Ordinarily one inch, miner's measure, of water—equal to ten gallons per minute—is sufficient to irrigate an acre of the driest land. The average quantity of pasturage land required to raise one head of beef for market is about three acres—on natural pasturage. The growth of grass is generally diminished by pasturage unless agriculture and improvement are resorted to. Sheep and cattle do not graze well on the same land; cattle will not graze where sheep range.

There are in California about 19,000,000 acres of timber land. The redwood timber belt on the coast contains about 3,500,000 acres, and the pine region of the Sierra between 15,000,000 and 16,000,000 acres. In the first-mentioned belt the timber is chiefly redwood, with pine, fir, and cedar. In the Sierra the timber is pine, fir, spruce, and cedar. The sequoia is found on the west slope of the Sierra, between latitudes 35° 47′ N. and 37° 50′ N.

The only timber planted in California to any extent, except fruit trees, is the *eucalyptus*. I would sell timber land in the same manner as agricultural land—allow one year after survey for homestead and pre-emption claimants, then offer the remainder at public sale to the highest bidder, and make what is then left subject to private entry.

In my opinion the best preventive of destruction of timber, either by fires or cutting, is private ownership.

The law should require that locations of mining claims be recorded in the office of the recorder of the county in which the claim is situated. This with a rigid enforcement of that portion of the act of May 10, 1872, which requires the *boundaries* of a mining claim to be located upon the ground so they can be readily traced would make the laws relative to mining claims as perfect as need be. The boundaries of locations should be fenced or indicated by monuments erected along them, in sight of each other, and in no case more than fifty or one hundred feet apart, thereby fixing the *locus* beyond possibility of floating.

Very respectfully, your obedient servant,

THEO. WAGNER,
United States Surveyor-General.

Testimony of Thomas Waser, attorney-at-law for land claimants, El Dorado County, Cal.

The questions to which the following answers are given, will be found no sheet facing page 1.

1. Thomas Waser, Placerville, attorney for land claimants.

2. Twenty-five years in California; all of said time in the mining region of El Dorado County.

3. I have, to 80 acres of mineral land, under the mining laws of the United States.

4. By acting as attorney for land claimants for the past eight years, under the homestead, pre-emption, and mining laws.

5. Until the past two or three years. Patents were issued in many cases in a few weeks after final entry at the Sacramento office. The cost to a mineral claimant, without contest, including attorney's fee, $50, would pay for everything, and parties did not go to the office at all when no contest exists. We have had lots of trouble in contested cases between mineral and agricultural claimants, also several contests between miners, the costs and expenses always amounting to more than the property was worth. For the past few years it seems to be almost impossible to get a patent for anything.

6. Amend the mining laws so that there shall be a time certain in which claimants shall be required to make final entry. Have patents issued in every case where there is no contest or adverse claim, and have the patent include everything there is in the ground, including quartz, except ditch and water rights, whether mineral or agricultural.

7. In this section the lands are mainly agricultural and grazing. Even those classed as mineral at this altitude (1,823 feet) are susceptible of the highest state of cultivation. The only question not settled by some, what are the great body of the foot-hill lands of California most valuable for?

8. Our lands are fast being settled and claimed. By allowing settlers under the homestead and pre-emption laws, as well as mining laws, to lay their claims and

require them to conform to the law, whether they claim as mineral or otherwise; and, after satisfactory proof is filed with the local land office and the entry is made, give the man a title without delay, and remove the requirement of posting notices and disproving mineral by publication; it costs too much. I refer to lands susceptible of cultivation, and no one knows that, better than the settlers themselves, our grazing and timber lands, that have no other agricultural value, should be sold in sections, as a less quantity would not justify. They can be properly classified by any intelligent commission by personal observation.

AGRICULTURE.

1. Best in the world. About thirty-five or forty inches per year; snowfall at this point about ten inches. During the season supply of water sufficient for the present demand and population.

2. Commences in November, and continues till February or March, with showers later in the spring; at a season when it does no good at all for irrigation, other than to furnish the earth with its annual supply of water.

3. But little successfully. Grain sowed in the fall will usually do well, and grapes over four years old will do tolerable without irrigation; but these foot-hills are not a success without water, with it they will produce everything.

4. Nearly all of it.

5. Clovers of all kinds, three and four crops a year. The best of fruits and grapes, potatoes, &c.

6. No wheat irrigated at all; it don't need it if sown in the fall, and won't pay to irrigate wheat.

7. A large canal tapping the South Fork of the American River and lakes in the vicinity of its source.

8. A great deal of water is used to irrigate after being used for mining, which, with its sediment, is a great improvement to the lands. Crops are uncertain after you get above, say, 3,000 feet above sea level.

9. Water sold for irrigating is usually absorbed in the ground, as it is bought in small quantities and distributed as long as it will run. It is measured out in small boxes and outlets from the main canal and ditch or reservoir and sold by the day at 25 cents per inch (of 2-inch pressure) ten hours per day. No *voluntary* return to the stream.

10. Nearly the whole supply. By a system of storage in the mountains sufficient water could be saved from the melting snows to irrigate this whole country requiring it. Claimed under local laws declaring the title and use of the water in the locator, provided it is used for some valuable purpose.

11. As many as there have been about land, the water rights being the most valuable.

12. About two-thirds of our county, so far, but more especially the portion lying well up in the Sierra Nevada Mountains.

13. Yes, if the settler so desires; but lands having only pastoral or timber value I would sell in sections.

14. No. Under stringent law I would sell to settlers in *good* faith not to exceed *one* section to the man, and no second entry allowed.

18. Greatly diminished from the increase of stock, not allowing the seeds to ripen and keep up the supply.

21. Usually good. Mountain streams, springs, and ditches.

24. No. Sheep let cattle out.

25. Often trouble arises. Cattle and sheep won't do together at all.

27. Our lands are all surveyed. The timber land I would sell at $2.50, and pasture or mountain grazing land being properly classed at $1.25 per acre.

28. Surveys made by government are poorly marked. Often or nearly entirely the corners are indicated by some little stake cut on the ground, which is gone in a year or two, and the settler is compelled to have it surveyed at his own expense. No stone corners or mounds. This part of the public service needs *reform*.

TIMBER.

1. About one-fourth of the county, or 470 square miles; principally pine, with spruce, fir and oak.

3. In sections to the individual; not but one entry by actual sale—I mean those lands that should be classed as such, having little or no other value—at not less than $2.50 per acre, for the reason that if those timber lands become the property of the people in reasonable quantities the timber will be protected and not allowed, as it is now, to be destroyed by shake-makers and other parties, who are fast denuding our mountain sides of the finest pine forests the sun shines on. It is a burning shame on our government that the timber is thus being destroyed. True, it is not to-day in or

very near to market, but it will be in a very short time. Sell them, by all means, for their own existence.

5. No.

6. Sell the land and let the owners look out for fire.

7. Getting worse every year; no one to object. Shake-makers worst. Can't stop it without the land and timber becomes private property—that is, it won't pay. It will be destroyed, if not disposed of.

8. Cut what you want, and after it is felled, if it ain't in the right place or don't work up to suit you, cut another tree.

9. I think they would, and if they did not stop it I would turn them out of office.

LODE CLAIMS.

1. Personal experience and observation for twenty-five years in the mining regions of California and for eight years past procuring patents.

2. Allowing parties to hold claims and not pay for them, and excepting quartz (if known to exist), whether valuable, even not owned, from the patent. This country is full of quartz veins that have no mineral value, and are not owned or claimed at the date of an agricultural patent. Give the grantee everything in the ground at the date of the patent, unless there are adverse claimants.

3. I would not allow it to be done. Give the oldest locator his lode, with sufficient ground adjoining, including *all* unclaimed veins within his lines, and not allow any other location or application to interfere with him, either on top or bottom. Then, if a party can't prospect and ascertain the general dip and direction of his mine, it is his fault.

4. The croppings or exposed surface of the vein or lode. Generally they can, with a little work most always. That is the reason I would not allow overlappings on the surface.

5. Give him proper time—say at least prior to his making application for survey—to ascertain the course of the continuation of his discovery shaft.

6. Yes, a great deal. The present law confuses the whole matter and encourages litigation.

7. Yes; but being separate on the surface, but uniting at a small depth.

9. Never to my knowledge.

10. They do, but not often. I think in a breadth of 600 feet of surface owners would be generally safe, and satisfied they could retain the lode within their own ground.

11. To the disadvantage of *bona-fide* miners.

12. B can't claim under the present law; but A can't enter B's surface for the purpose of working his lode. He must follow the vein, and *may* to any depth, though it enter land adjoining.

13. Since a claim becomes abandoned for no work under the present law a great deal of litigation has been stopped. The people generally obey the law.

14. It is possible, but not good policy, in my judgment. Six hundred feet of surface, with all the unclaimed veins at the date of the entry, will protect ninety-five out of every one hundred in this vicinity.

15. I have. Slug Gulch district, in this county, and others. Possibly a dozen present; not necessarily miners, for a man is a miner to-day and next week a farmer. Recorder of claims to keep a record of the laws in force and record all locations, &c.

16. Since May, 1872. Many districts have changed their local laws to conform with the United States laws. Among miners their respective rights are generally respected whether the law is strictly observed or not.

17. Yes, by giving notice of a meeting to be held for the purpose.

18. Not to any great extent. There must be possession and labor done. There is but little jumping of claims in this section.

19. I think it could be. I think by posting and publishing, as now required, all parties in interest are fully protected.

20. I think not, for the reason it would be too expensive to litigants to have their case transferred to the Land Office, by reason of distance and expense, and leaving the whole matter subject to confirmation by the Commissioner and appeal to the Secretary of the Interior afterward.

Yes. As the homestead and pre-emption laws require proof and payment within given times, so ought mining land. I have had a great deal of trouble in this regard. As to time, say one year *after filing application* for the ground in the United States Land Office.

PLACER CLAIMS.

1. We are situate in the central or mineral belt of California. Probably one-third of the settled portion of this county may be classed as mineral land. Character and nature generally surface, gulch, creek, and river, together with a considerable quartz, porphyry, seam and vein diggings.

2. Quite so, by being exclusively engaged in adjusting claims, settling controversies between miners and ranchers, procuring patents, &c.

3. Until the past two or three years I could get a patent in a few weeks after final entry at the local office. Quartz patents, exclusive of the price of the land, cost about $145, as follows: Surveyor-general's office, for office work, $40; survey in the field, $50; publishing, $15; filing in the land office, &c., $15; attorney's fee, $25; this is without contest; with contest, no limit, often from $1,000 to $5,000. For the past few years but few patents have been issued in this section. The expense for a placer patent without contest is $50; with contest the expense depends entirely upon the value of the claim.

4. About the same as my own.

5. They are.

6. In many, nearly all the original mining districts, the local laws regarding original locations of claims have become entirely extinct, and since the survey of the mining lands parties having the possessory right to a small claim in making application for patent extend their lines to correspond to the section lines—that is, to correspond to the United States law. This is done to save expense in survey and further the original location. For instance, would say from "hill to hill," or "to the center" of the hill, which is very indefinite, to say the least. Hence it is impossible to get a patent on any of the old locations. They are generally relocated, so as to correspond to the present law. Record evidence is now required, which is the hardest thing to furnish I have yet met with. This order is the last. There is not one claim in twenty that has any record title whatever, interests being simply transferred by word of mouth, sometimes by simple bill of sale, oftener by abandonment, and to be required to furnish abstracts and record title by complete abstract from locators down to applicants is simply impossible. In the first place, the great majority of the placer mining land in this section has but little value for mineral over its agricultural value. Yet the owners prefer, from developments made, or its supposed mineral value in the future, to secure a mining title. Now, I would first amend the law so as to give a title to everything in the ground not claimed adversely at the *date of the entry* at the *local land office*, and I would not require any other evidence of title than the affidavits of, say, two disinterested witnesses, together with the applicant, say as at present, and where no adverse claim was filed allow the party to enter the land. This, with the publishing, posting, filing, posting in land office, with affidavits as to work, possession, and ownership, &c., is certainly sufficient, as the present law requires the expenditure of $100 annually. If that ain't done it gives some one else a chance. But the most important points are to amend the present law. First, let the present limit as to quantity stand; 2d, give to the purchaser all there is in the ground, including quartz unclaimed (by adverse filing), at the *date* of entry at the local office, and require the applicant to pay for his ground within one year after applying therefor; 3d, let the patent be issued upon the fact that *no adverse claim* appeared prior to entry, and not require record title. It can't be done. Our placer or surface mines have been worked over and over again for many years, and it is only with the hope of there being developments made in the hills or deep stratas of gravel that attaches any value to those lands except as agricultural, and it is no detriment to the emigrant, poor man, or prospector to have all the lands sold, for the time has passed when anything can be made at mining except at great outlay of capital and labor, and at best it is hazardous in the extreme; while on the other hand all the old abandoned and exhausted mines make the best of agricultural lands by filling up with sediment and *débris*, oftentimes in value rising from $200 to $500 per acre, and many mining patents already issued are being cultivated by those buying for agricultural purposes. One fact certain is that the owners are going to and do now use their lands for the purposes they are most valuable for.

7. Sometimes they are, for the reason it gives a better title, and is more satisfactory to the owner, under the idea that there might be discovered deep diggings, or from the fact that they had in years gone by contained rich surface mines, and also from the fact that the said lands would be returned by the surveyor as mineral land. And another reason is, those applications are generally made on odd sections inside of the Central Pacific Railroad grant, through fear that if the company got the land they would charge exorbitant prices for it.

8. It has not as a rule. There may sometimes be veins in the surface known only to the applicant, but they have no value without development, and then the party holding the land ought to have them.

9. I do not; because our State law provides for the working of mines by easement, condemning adjoining land, the right of way, &c., which can always be obtained by law when the right desired cannot otherwise be obtained.

The great trouble and expense now upon those seeking to get a patent to their land for agricultural land is the order requiring additional proof required as to the mineral character. This is done by the Commissioner after the land has been paid for, notice published and posted, and evidence taken on blanks furnished by the government, and

no contest of any kind appearing, the title should pass and not require the applicant to go all over the form again, costing him nearly and oftentimes more than he pays the government for the land itself. I have known of many instances, in fact it is the exception in place of a rule, that a man cannot get a patent unless he goes to the office with his witnesses two and sometimes three times, and has to publish and post notices over and over again, until people in this vicinity have almost despaired of ever getting title at all. Now when a man has substantially complied with the law and satisfied the local land offices and makes his entry, where no kind of contest appears, to give him a patent.

Respectfully,

THOMAS WASER.

Testimony of Stephen C. Wheeler, of Plymouth, Amador County, Cal.

Answer to questions submitted by the Public Land Commission.

1. Stephen C. Wheeler; Plymouth, Amador County, California; farmer and miner.
2. Twenty-seven years.
3. I have not.
4. By acting as counsel to procure title under pre-emption and homestead laws.
5. Under the pre-emption laws; ninety days' residence, thirty days' publication is the minimum. Patent issued in from three months to three years. Uncontested. Two hundred dollars improvements; issuing six citations, $6; taking proofs, register's fee, $10; counsel fee, $5; payment for land, $200. Contested cases are seldom decided and approved in less than six months, and often nothing is known by the claimants for two and even three years. Contests cost from $100 to $1,000. Often the land is less in value than the cost of contest.
6. Only as to taking proofs and evidence. It is very expensive to take witnesses 50 to 100 miles to the United States Land Office and keep them there from two to ten days in contested cases. The county judge should be authorized to take the evidence in all contested cases. The simple proofs, both in pre-emption and homestead, should be taken before the nearest justice of the peace or notary public.
7. The "foot-hill" region consists of one-half agricultural, two-fifths pastoral, and the remainder mineral, all containing timber in limited quantity. The higher foot-hills, 2,000 feet above the sea-level, and from that elevation up to 6,000 feet, contains all the really valuable timber on the western slope of the Sierra Nevada Mountains.
8. Judging from actual knowledge, obtained by a thorough acquaintance with the physical character of the foot-hills and mountains on the western slope in Amador, El Dorado, and Placer Counties, I am of the opinion that it will be impracticable for the government to attempt to ascertain and fix the character of the classes named other than by a general rule, and that *rule* to be *unoccupied land* belonging to the government.
9. No practical advantage can be gained by adopting any other method of land-parceling surveys. The one now in use is plain and easily understood and by it every 2½-acre lot in the whole State can be designated. What more is needed in that respect? The different "classes" are so irregular in occurrence that it would be impossible to classify only by a general rule.
10. No better method of disposing of the *agricultural* land here is needed. Pastoral and timber lands *unoccupied* should be disposed of by private entry; pastoral by sections and timber by quarter section, limiting the purchaser to four sections of the former and one of the latter.

Stockmen during the month of May drive their herds eastward to the mountains where green feed is found during the summer months. By securing title to a choice quarter section of land by pre-emption the stock owner secures a home during the summer months and his cattle, horses, sheep, or goats roam at the will of the herders over the surrounding vale and mountains consisting of *government lands*. During the month of October the stockmen return with their herds to their homes in the "foot-hills" or valleys. This move is rendered necessary on account of the severe snow-storms that occur during the winter months, especially above the altitude of 3,000 feet. Let this land be offered at private entry at $1.25 per acre, by the section or otherwise.

AGRICULTURE.

1. The climate 40 miles east of Sacramento is dry and warm from April to October; temperature from 50° to 110° as the extremes; generally from 60° to 80°, varying from those two points every twenty-four hours. This point has an altitude of 1,400 feet; as you proceed eastward the climate changes and the greater the altitude the lower the temperature. Snow seldom falls at this altitude; 15 miles above this snow falls to the depth of two or three feet, and 50 miles above or eastward it often reaches the depth

of 10 feet, sometimes 20 feet. Rainfall varies from 15 to 50 inches annually. Rainy season usually begins in November and continues to April. Three-fourths of the rain usually falls in December and January. The supply of water for irrigation is limited, is owned by corporations, and used for propelling power and mining.

2. Usually the first rains occur during the latter part of October and seldom exceeds 1 inch, then we have clear weather or Indian summer extending into the first half of December. Then light rains for a few days, then cold, frosty weather or cold rains throughout the month, temperature going down as low as 32° during the night and rising from 50° to 60° during the day in clear weather. January is generally the month of greatest rainfall. February is generally a wet month, but the rains are light and come often. March is cloudy and windy, with occasional light rains. Next comes the April showers, warm and pleasant and liable to come at any moment, often from an almost cloudless sky. May and June are sometimes dry months throughout, sometimes furnishing from 1 to 3 inches of water, but variable. July, August, and September all sunshine. The melting snow in April and May gives plenty of water, which passes by. June, July, and August are the months when irrigation is most needed and when the water supply is short, very short.

3. Wheat, barley, oats, and rye can be raised without irrigation, and early potatoes.

4. All kinds of vegetables and fruit, except grapes, require irrigation.

5. Fruit and vegetables.

7. The Cossumnes and Mokolumno Rivers and melting snow.

8. Not to exceed 3,000 feet for cereals. Potatoes and hardy vegetables and apples and plums can be grown at an altitude of 5,000, but not successfully on account of late frosts.

10. The whole amount of natural water in the streams during the dry season is owned and controlled by mining corporations under State laws.

13. It is not, as most of the pasturage land is, high up in the mountains where families cannot reside in winter. And further, no person desires pasturage land unless he owns the herds to make it available; and if he owns the herds he is able to buy the land.

14. It is undoubtedly the best policy to put these lands (pasturage and timber lands) into the market for private entry and limit the quantity to each purchaser.

15. Pasturage land in any one locality will not raise beef for market. Food is required during the winter months for all kinds of stock except goats. Stockmen have farms in the lower foot-hills and valleys where they raise feed and keep their stock from October till March by feeding. In March there is green feed there, and the stock thrives on that till May, when the feed dries up, and they start with their stock for the mountains, where they find green feed till October comes again. And this is the class of men that will be forced to buy if the land is open to private entry.

16. Ten head of good cows will support an average family if the family owns 160 acres of land to raise feed to keep them during the rainy season. Pasturage land here will not keep stock in good condition the year round.

17. From 30 to 40 in this locality.

18. It has diminished more than 50 per cent. in 20 years.

19. Cattle-raisers do not fence their ranges as a rule.

20. "Specific ranges," in the same locality, would not support stock the year round.

21. Never-failing spring of good water.

22. Ten head, where large bands are kept together.

23. It has diminished materially.

24. Cattle will not graze where sheep are kept.

25. Conflicts on pasturage land are generally settled by mutual consent, as stockmen are all trespassers, depending entirely upon the government pastures to feed their stock at least 6 months in each year.

26. Five thousand head of horned cattle and 25,000 head of sheep and graded Angora goats, in herds of from 500 to 2,000. Stockmen who reside in many of the valley counties depend upon the mountain pastures for stockfeed during the summer months, driving their stock 100 miles or more.

27. No suggestions, only those already stated. As to surveys, it is best to let "well enough alone."

28. None, to my knowleege, and have never heard of any.

TIMBER.

1. The timber here consists of half a dozen species of the oak, and is only valuable for firewood. All the land not cultivated is covered with a scattering growth of scrub-oak.

2. The really valuable timber grows above the altitude of 2,500 feet, and the lower limit is ten miles east of here.

3. Offer them at private entry at $1.25 per acre by quarter section, and not in smaller tracts, limiting the purchaser to one section.

This plan will, in my opinion, put a stop to the destructive depredations of "timber jumpers." Private ownership is really the true method to adopt, and any change in the law which will conduce or hasten to this end will be a great benefit.

4. I would not classify, other than offering all the "timber lands" above the limit of 2,000 feet altitude at $1.25 per acre, in tracts of not less than quarter sections.

5. There is always a second growth where timber is felled, but forest fires are very destructive in forests of small pines. And if owned by individuals, such precautions would be used as to make destructive fires of rare occurrence. Pine timber will grow to the height of 20 feet and 6 inches diameter at the base in twenty years.

6. Forest fires almost always originate in the carelessness of campers or hunters, and not by stockmen or timber-jumpers. Forests that have not been felled and remain in their native state are not much damaged by fires. The greatest destruction in forest fires is caused by the felling of choice trees here and there in the forest, using the choice part and leaving the remainder on the ground. This, during the dry season, feeds the fire and creates an intense heat, sufficient to destroy every tree in the forest, not consuming them, but destroying life, leaving them standing monuments of destruction.

7. The depredations on public timber have been made for the purpose of securing timber for mining, building, and agricultural purposes. Along the lower belt of timber, extending into the timber where easy of access with teams for five to ten miles, the timber is entirely removed, and timbermen are continually extending their encroachments. Some of the largest quartz mines in this county require at least 2,000,000 feet per annum for their successful working. As an approximate estimate, there has not been less than 10,000,000 of feet of public timber cut and used in Amador County for the five years last passed per annum, and the demands are increasing continually. For many purposes where split timber is used at least one-half is left to decay or to feed fires to destroy that which is left standing.

I can state positively that one man in Amador County, with the authority of the government to back him, who is well acquainted with the locality, can put a stop to this unnecessary waste. Let Congress authorize the appointment of an agent at a salary of $5 per day while actually engaged in watching the roads leading to the timber, with authority to make arrests and subpœna witnesses, &c. But by all means keep everything of this character out of the hands of registers and receivers. Three months in the year would suffice, as the timber-cutters must do their work early in the dry season.

8. The only local custom is to cut the timber wherever you find it unoccupied. The right of the party who fells the timber is unquestioned.

9. Judging from past experience in the district land offices, I would say by all means keep it out of their jurisdiction.

The manner in which land affairs have been managed in the Sacramento land office has earned for it the name of a fraud and a swindle, and we often hear that name applied to it. I do not say from my own knowledge that such is the case. But no man who has been a register could be elected as Congressman; or, in other words, it is an unpopular institution with the masses.

LODE CLAIMS.

1. I have been engaged in mining for 15 years since residing here, half the time in placer, the remainder in quartz or lode mining, in almost every capacity connected with practical mining. I have had no experience as a mine surveyor other than what is necessary in the practical working thereof. My experience in litigation only extends to contests as to mineral *vs.* agricultural.

I shall not attempt to answer from question 2 to 14, as I consider them "theoretical, and not practical, in this locality. No litigation of that kind, to my knowledge, has ever occurred in this locality. "True lodes" are not continuous. No practical "rule" can be adopted to meet the demands of an "irregularity." I cannot better define "an irregularity" than by explaining that it is a "lode" or "rock in place," bearing the precious metals, even in the most favored locality.

15. I have assisted in forming Indian Creek mining district in 1853, Puckerville mining district in 1860, Plymouth in 1879; was elected recorder in both the former districts, to serve for one year. The first was done by about 60 actual miners, the second by about 40, and the last one by 25 miners and citizens. The recorder was the only officer elected after the temporary organization. Five miners, under the adopted laws, could call a meeting, by posting notices for 10 days, to amend, or elect a new recorder. The duties of the recorder were to take a copy of the notice posted on the claim describing the metes and bounds and the names of the locators, and make it matter of record by copying verbatim in a book provided for the purpose, open for inspection on demand by any miner. All three of the above mining districts are located near the northern boundary of Amador County.

16. Post a notice on each end the claim, width not specified, but including all the dips, angles, and spurs of the lode claimed. One hundred feet was the length of claim

allowed in 1853, double to the discoverer. In 1860, 200 feet for each locator, double that length for discovery, and in 1879 we adopted the law of Congress of April 10, 1872.

17. The record is only proof of the original location or amended location, nothing more. In case one year elapsed without performing the required amount of labor the locator's rights were forfeited. After that time, when the original locator found the claim unoccupied, he could relocate and amend. No provision in the law for other amendments by locator or recorder.

18. Never, to my knowledge.

19. Miners in California no longer need local mining laws. Their time has passed. As to all future locations abolish them at once.

20. There is no justice in allowing one class of claimants privileges that others are barred from. Keep them out of the courts and in the land office until decided.

21. The United States mining laws are partial in effect, giving the mineral claimant rights properly belonging to the agricultural claimant—allowing mining locations inside the inclosure of the latter claimant, also placing the burden of proof with the agricultural claimant. I have known great injustice done to the latter class of claimants. For instance, in 1856 A, while placer mining, discovers a rich seam or lode of quartz, on which he makes a location and commences sinking a shaft and taking out rock. He works this seam to the depth of one hundred feet and takes out $10,000, when the seam enlarges to a ledge of five feet, but fails to pay the cost of working and is abandoned. B, in 1876, desires to homestead the land on which the abandoned claim is located. B files his homestead declaration, and improves the land, erects his dwelling near where the shaft of A is located. At the end of five years B desires to make proof on his homestead. A appears and proves that there is rock in place bearing gold on the premises, and B is not allowed to purchase the land on which his dwelling stands. Yet the mineral claimant will not purchase, because he can, under the present law, hold it without.

22. Hundreds of claims are located and worked out and abandoned under the present law. Many claims are held for speculative purposes, and government title is not desired until the locator finds a purchaser. Possessory titles should be limited to one year. This would remove one of the principal causes of contest between agricultural and mineral claimants. The location of a mining claim is no proof that the land is mineral in character.

PLACER CLAIMS.

1. About 5 per cent.
2. Promiscuous distribution.
3. Time, six months to two years; cost, $110, exclusive of the land. Contested cases from two hundred to one thousand, often more.
5. In general, good enough.
6. I know of no litigation between mineral claimants.
7. They are not.
8. Not to my knowledge.
9. Nothing of the kind.

Testimony of J. H. Wildes, at San Francisco, Cal., chief draughtsman, office surveyor-general of California.

Examination of J. H. Wildes, chief draughtsman, office surveyor-general of California, at San Francisco, October 9, 1879, by Messrs. King & Britton.

(When avoidable, the questions which elicited this statement are not inserted, but their tenor can be perceived from the character of answers given.)

There are three principal initial points for meridian and standard lines in California; one at Mount Diablo, another at San Bernardino, and one at Humboldt. These were all connected with the Coast Survey lines in early days, and are supposed to be correct. I don't know how they were located. I have no personal knowledge of these standard and base lines when projected for considerable distances, but they are generally considered accurate. I have no knowledge of any trigonometrical or astronomical tests having been made of the accuracy of distances measured by them.

If properly executed, I think the present system of contract service for townshiping and sectionizing is sufficiently accurate for practical purposes, and that the fair execution of the system will mark township and section corners in a permanent manner. My opinion is that the township corners should be marked in a more permanent manner than they now are. As it is now, there has some times been difficulty in finding them, but I cannot state cases.

I am not prepared to say exactly whether it is practicable by the methods of survey now prescribed by law to get an actually correct line—say east and west—as long

as 100 miles; but I believe that by careful chaining and the proper use of the solar compass such a line can be established within the limits fixed by the General Land Office for errors.

Where connections have been made which brought standard lines together township from one standard line to another, the result has been that the distance between the standards have been too short in some cases and in other cases too long. I do not remember whether there have ever been, or have not been, close connections made between such lines. If, in cases where these connections were found to be incorrect and the corner posts were obliterated by accident or design, a man's claim affected by those corners could be re-established by measuring the distance between standards, say from any initial point, or if all corners were obliterated, by having recourse to the field-notes of the survey used in the first survey. In that case we would have to follow those notes.

Question. Is it possible for two men to chain 20 miles of irregular country at different times and arrive at precisely the same results?—Answer. No, it is not.

Q. Therefore, if you undertook to run out a claim from such data you could not hit it the second time?—A. Well, measuring between two points twenty miles apart in that way there would inevitably be a difference in chaining. No two surveyors can run over the same ground and give precisely the same results. The discrepancy between the two would be based upon errors both of measurement and of direction; most likely on errors of measurement. Therefore, since it is impossible to make the same measurement twice, it would not be practicable to exactly relocate a lost claim of any kind in the absence of permanent monuments. They might be more permanent perhaps, but those now used—as peaks, trees, and points of junction of streams—are reasonably permanent. I think we might reasonably expect to find some of them and that, while difficult, such relocation could be made even on the San Joaquin plain. In speaking of a peak I mean that two men could get the same observation from it if there was a monument there to localize the spot. Those things are always considered sufficiently accurate, so far as the relocation of the original point is concerned.

Q. As I understand you, chaining is admittedly inaccurate and that by that method no two men can reach exactly the same point. The only other mode you have for correction is by taking those bearings you have described. I ask you now what rule have you for locating that point? What does it amount to in an approximate location?—A. I consider the cases extremely rare where you could reach exactly the same point.

Q. Suppose the location only valuable for a spring which occupied a space of four feet square. Would you under ordinary circumstances, monuments being obliterated, be able to establish definitely by a second survey whether that spring was or was not in the original survey?—A. I think I could establish whether it was within a certain quarter section or a certain quarter of a quarter section of land.

Q. But if the spring be located within three feet of the boundary?—A. That is an amount of accuracy to which we do not pretend and which the surveyor's contract does not require. In other words we could not in that case made so accurate a survey but what the value of the possession might be thrown the other way by an error in the second survey.

Q. In the case of a Spanish grant, having one boundary line upon a stream, have there not been some instances where the initial point of survey was at some distance from the stream that the resurvey of the grant has withdrawn the grant from the river and shut it off from the water?—A. I cannot recollect of any such instances at this time, although I cannot say that they have not occurred.

Q. Do you remember the Boca de la Plaza grant? Does not the diseño call for the boundary along the stream?—A. Not to my recollection.

(NOTE.—The plot of survey was referred to, but examination disclosed it was not the case Mr. King referred to.)

Q. What I wanted to get at was whether in all cases, the monuments being obliterated, you could be sure to reproduce the original claim by resurvey?—A. I think we could absolutely. For instance the Spanish grants are different from the public land system. The distances are generally given from the river, and if the river should change its bed, still by having the proper variation we can go on and rerun the lines. And by coming around to the initial point again we could calculate very nearly.

Q. Practically, how do the resurvey of the Spanish grants agree? Have you had occasion to resurvey a good many of them?—A. Many resurveys of ranches have been made for changes of boundaries, but I remember but one made for alleged errors in survey, which were found in both bearing and length of several courses.

Q. In the case of mineral monuments, what are they related to in this State?—A. They have no relation to anything. They are arbitrarily placed in different districts, and the connections are made with them. For instance, in the case of a subdivided township, where we can connect within a certain distance with a public corner we do so, but otherwise we have to establish arbitrary monuments.

Q. What error do you admit in chaining?—A. We admit fifty links to one mile.

Q. Do you admit the same error in the connection of mineral surveys?—A. We do.

Q. Do you know instances in this State where surveys of mineral claims under different contracts have overlapped?—A. We have had such.

Q. What was the cause of that?—A. In the cases I remember there has been conflict of ownership.

Q. And do you know of any instances in which a contest has arisen from an erroneous survey?—A. We have no such cases as that. Where we find that there is a conflict arising from a cause like that, we send the survey back to the deputy and call for a correction.

Q. How do you know which of his surveys is the correct one?—A. We cannot tell. It must be established by proof before the register of the proper land office.

Q. What possible proof can be made as to the correctness of one survey over another?—A. There is none that I am aware of, except the sending of a third party to verify it.

By Mr. BRITTON:

Q. Upon the hypothesis that your mineral monuments are obliterated, how can you locate a mineral survey?—A. I do not know of any method of doing it unless the position of the mineral monument is fixed by triangulation from some well-known point. You might locate it by taking the confluence of streams, but that too would be very indefinite, unless you established there a mineral monument by inserting an iron bar at some definite spot.

Q. That would not be very definite, as it might be removed. The claim might lie in a country like the San Joaquin plains. How then?—A. There would be no possible means of re-establishing a survey there.

Q. Suppose the mineral monuments and those of the claim were all gone, and there had been no triangulation to known objects, what chance would you then have of retracing the survey?—A. If the mineral monuments were gone; if there were no objects of reference locating mineral monuments, you would have nothing to depend upon except such topographical features as are furnished by the field-notes.

Q. Suppose in an isolated region you establish a mineral monument, measure to the corner of a claim, and then measure the claim, what check, aside from the mere chaining, have you on the general measurement?—A. None, except the course and distance, and the topographical notes of the survey.

Q. Are not the mining districts very often in rough country, with precipitous and abrupt slopes? Do you regard chaining as an adequate method in such cases?—A. Yes, I do, as chaining can be combined with triangulation if necessary.

Q. Do you suppose you can make 100 chains in a rough country with approximate accuracy?—A. Yes. I do not remember of any difficulties having arisen in this State owing to defects in the methods used in our surveys. I do not know of any legal contests having arisen because of there being defects in our methods, or that they have ever been called into question at all. There are cases in which erroneous surveys have been charged, but I do not know to what those erroneous surveys are attributed. I know that charges of erroneous surveys have been made against surveyors, but such matters do not belong to or come before this part of the office. Some township subdivision surveys have been set aside by the Commissioner as fraudulent; but I do not know what was the fraud charged. His decision, if made known, was communicated to the surveyor-general. In cases where we find an overlapping either way in platting the field-notes, we send the survey back to the deputy for correction. Also, where clerical errors or those of calculation are discovered we send it back, informally, for correction.

Q. What means have you for knowing that his second is more correct than his first?—A. We have no means whatever. It may be a correction on paper merely. We have no information beyond that contained in the papers before us. If the survey proves to be mathematically correct we have to accept it. I do not know all of the surveyors personally. If the surveys appear to be correct we in this office have no criticisms to make about them.

I have no means in this office of telling whether or not a survey has actually been made to the extent of swearing to it. It is like this: I am sitting here in the office and a survey is brought to me to have plotted and examined. Never having been upon the ground I cannot swear that it has been made. If it is mathematically correct and if it closes I have to accept it. It is not open to my criticism, and all other matters pertaining to it have to go before the surveyor-general. It is therefore, to answer your question, entirely within the power of a contractor to return a set of field-notes mathematically correct when the whole survey was made on paper, and not in the field at all, and the only means of detection I would have would arise from knowledge possessed by the office of the topography as known from other and outside data, which memoranda did not agree with the survey in question. We would return his survey in that case and say it could not be correct. Our only check is that obtained from whatever official and accidental data we may have of the neighborhood. That data is equally accessible to any contractor who might wish to prepare fraudulent notes, as he must come into the office to find out what lines have been run in the field. I think

a man could go into a tract of country, and having some knowledge of its topography, construct a set of field-notes that, in the absence of inspection in the field and data in the office, we would have to accept. I think there should always be inspectors to go into the field and inspect surveys. It should have been so from the first. I have had no occasion to know personally about the surveys in San Bernardino County.

As regards the expediency of employing salaried surveyors rather than having the work done by contract system, I think the contract system, if properly carried out, preferable at this stage on the ground of economy. I think if a system of having a salaried corps of surveyors had been initiated from the first it would have been far better; but now as we have got to surveying in a mountainous country I doubt if such a corps could carry on the work as economically as it can be done by contract. Contracts in such regions do not afford large profits at present rates, and small contracts sometimes result in a loss.

There may be more unsurveyed than surveyed public land in some States, but it is not so in California—I mean land fit for agricultural purposes. The larger part of the timber belt, which is about 500 by 60 miles, remains unsurveyed; but out of about 100,000,000 acres only about 40,000,000 remain unsurveyed, and it is a very difficult question to answer what part of that is serviceable or available for agricultural purposes.

I do not approve of contracting for the expenditure of the money appropriated for surveys without an inspection as to the character of the land, to serve as a guide in giving contracts. While I have no fault to find with the contractors at present and recently employed, and while I have no reason to think that in the past three or four years the work has not been well done, I think that an additional appropriation, made exclusively for the careful examination of surveying work, would improve its character. There have been one or two instances where the work has not been well done, perhaps, but we have generally employed the right kind of men so far as I am aware. The only check upon surveyors is their oath. I am not aware of any other species of work done by government or private corporations in which the simple affidavit of the contractor is taken without criticism or inspection. My experience before coming here was that of a civil engineer in charge of public works in the North and South, and in conducting such we were always required to measure and inspect the work. I think there should be a salaried inspector for surveys.

There have been a number of surveys rejected during the past year. Some seven different townships surveyed under the Glover contracts were rejected and some three, I believe, under the Hansom. That contract was canceled. I do not know the reasons that influenced those rejections.

In the draughting office we know nothing of the work in the field, and all you would get here would be criticism on the mathematical accuracy of the notes returned.

There was an inspector sent here from Washington this year, as I understand, about some surveys the contract for which had been suspended, but I know nothing about his reports. We have nothing to do with any part of the surveys in this office but to examine the field and mathematical notes and papers. The rest of the work is done in other parts of the office. It is my outside opinion that an inspection in the field should always be made, irrespective of that instituted here of the field-notes. It is done in all other departments of the government.

If this office were furnished with object points, permanent and well defined, and knew their actual positions in the country to be surveyed, and with which surveys were to be connected, it would be a direct check upon the accuracy of surveys according to the rectangular method, and at the same time would facilitate the construction of a correct map of the State.

The surveying manual requires that the solar compass, or some other instrument of equal utility, be used wherever the variation of the needle is not uniform. I have no means of knowing what deputies use them. When I first came into the office surveyors would come to San Francisco and test their chains by the standard in the office. That was fifteen years ago; since then I have not seen anything of that kind done. I cannot swear that they still correct their chains by the standard or not, but presume they do, as the law requires the deputy surveyor to have with him a standard measure. The best deputies we have use the solar compass, taking their variations at the township and section corners. I know a good many deputies capable of surveying by triangulation.

Testimony of O. M. Wozencroft, of California, relative to agricultural lands.

The questions to which the following answers are given will be found on sheet facing page 1.

Public Land Commission:

GENTLEMEN: I herewith submit answers to some of your interrogatories.

1. My name, O. M. Wozencroft, residence California, occupation physician.
2. Have lived in California thirty years.
3. I have sought to acquire title to the desert lands known as the Colorado Desert, formerly the bed of the Gulf of California, under no existing law; but the act of Congress donating land to the State requiring capital and labor for their reclamation may be cited as a precedent, the general utility and common welfare a sufficient motive for the cession, as it is my purpose to irrigate those lands now barren and unproductive, and by cultivation make them fertile and productive. That it may not be considered a subsidy, I have agreed to pay the government the present appraised value of them.

* * * * * * *

7. The conformation of those lands is an inclined plane from circumference to center, with a gradient of near four feet to the mile, all of which being lower than the Colorado River, at a point eight miles below the junction of the Gila, and the extreme depression some 270 feet lower than the ocean level. The physical character—a hardpan basin devoid of all vegetation, on which the sun's rays play and by which the atmosphere is arid and excessively hot, 135° Fah. in summer; this arid, overheated atmosphere causing violent currents of wind, the heavier and colder bodies displacing the lighter heated air, and this arid atmosphere is carried to the surrounding country.

AGRICULTURE.

1. The climate, hot and arid; there is but little rainfall. There was but 1½ inches in 1877–'78, when 52 inches fell in the upper part of the State. Length of hot season, eight months. No snowfall.
2. The supply of water for irrigation is ample, from the Colorado River. The river is at its highest stage in June, a time when the most water is required for irrigation.
3. No portion can be cultivated without irrigation.
4. About 1,000,000 acres by irrigation.

* * * * * * *

7. The source of supply of water that could be applied to irrigation is all of the western slope of the Rocky Mountains between parallels of latitude 41 and 31. This great water-shed affords ample supply for the purpose of irrigating this basin.
8. The fertility of soil, instead of being impaired by irrigation, is materially improved by surface water carrying silt.

* * * * * * *

10. The water has not been taken up on any portion of the above source of supply, so far as I know.
11. And consequently there can be no conflicting water rights.

* * * * * * *

14. It will be impossible for the government to dispose of any portion of those lands by private entry, for the simple reason that the irrigating canal will be some 150 miles in length, will require a large outlay of capital, and must necessarily be under a general system and management, by which means alone can this formidable, valueless desert be removed and made productive.

* * * * * * *

27. I have no suggestion to offer in regard to the disposition of public lands other than this portion, and merely wish to say that, in making the disposition of it as stipulated in the bill now pending before Congress, the government has all to gain and nothing to lose; and it is the only disposition that can be made of it, without the government will expend the money and do the work. This measure has received that attention from the various committees on public lands which its importance demands, recommending its passage, and doubtless would long since have passed Congress had not the members been so pressed and importuned by their constituencies in private measures that a measure of general national importance is passed over. It is to be hoped that your Commission will investigate the merits of this measure and make a report which will be so authoritative as to induce Congress to act advisedly and promptly in making a disposition of this desert alike creditable to government and beneficial to her people.

Testimony of O. M. Wozencraft, of San Bernardino, taken at San Francisco, Cal.

O. M. WOZENCRAFT, of San Bernardino, testified at San Francisco, October 8:

I lived here thirty years. I think that four classes of land is a proper classification, mineral, agricultural or irrigable, pasturage, and timber land. My ideas about timber land would not be as authoritative as those of the gentleman to whom I listened yesterday and to-day. I have been over every part of the State, and am conversant with the physical geography of the State. The statement of the gentleman who pre-

ceded me is quite correct; and in reference to the timber belt in parallel 41, I would say that there is a very valuable growth of white oak, which is about the only white oak I have noticed in the State. There is a white pine in the same belt. It is valuable for all our timber purposes. It is not generally known that this belt is there. I examined it some twenty-five years ago. How far south of that valley this timber extends I do not know. The elevation could not have been over 2,000 feet, if that. As to the extent of timber, I can corroborate the statement made by the gentleman who preceded me. The pine and redwood which exists on the coast range from below Point Concepcion runs up entirely to the Oregon line. I have no idea how much has been destroyed by fire. I can't conceive that but little of the live timber would be destroyed by fire. The timber lands are valuable chiefly for timber purposes. They have some slight value for cultivation in the valley. I think that any system that will preserve the timber from wanton destruction would be very desirable. What that system would be I am unable to say. I have not considered the matter sufficiently for that. I think there should be some obligation on the part of persons owning the timber that they should plant trees, so that there should be a reproduction of them.

Question. The irrigable lands, as we have defined them, are limited in extent, are they not?—Answer. Well, there is a large body of land that could be irrigated if we had the water to irrigate with, but there is a great scarcity of water. There is a large body that can never be irrigated. That does not apply to any of the lands in Tulare or San Joaquin Valley. But there are lands still below there that can never be used for other than pasturage lands.

Q. Are these irrigable lands valuable to actual settlers in small quantities?—A. I conceive that the available lands that can be cultivated without irrigation in this State have all been taken up. I do not know of any not utilized. I think wherever irrigation is possible by small settlers, the water has already been taken up. I think that all the lands in the small valleys of California have been taken up under the desert-land act. There are large tracts to which the waters of the larger streams can be taken by the outlay of much capital.

Q. What disposition would you make of the pasturage lands?—A. The pasturage, where there is not water for irrigation, will, I conceive, have to be disposed of in large quantities, otherwise they will not be remunerative for stock-raising. In the early days we had some very valuable grass lands here; among the most valuable was the California clover, but now there is little or none in the State. In early days we passed through valleys so matted down that it was difficult to ride through them, but now it is hard to find any such in the State. This is the case with many other grasses, which have been eaten out by the sheep and any other stock. I think if a man was able to protect his grasses by fencing, he could keep them up and protect them. In my opinion the custom of pasturing stock without any restriction has tended to destroy the grasses. This indiscriminate grazing has destroyed them, and it will require another generation to replace them.

SAN FRANCISCO, *October* 16, 1879.

A. W. VON SCHMIDT, resident in California, deputy surveyor and civil engineer, testified as follows:

Question. Have you any suggestions to make about arable lands?—Answer. In regard to the arable lands, I do not think I would change the present laws at all, except to consolidate the homestead and pre-emption law. And I would let the mineral go with the land. There is a great deal of this land called foot-hills that contains a little gold, but it is not rich enough to work for mining purposes alone. Up to this time a great deal of this land has been taken up by persons who want to make homes, and they may not want to have their fields torn up or damage done to their farming operations. That portion of the land is generally found near or within a short distance of the foot-hills. I would restore the mineral lands along the foot-hills to pre-emption and homesteads, for the reason that it is not rich enough for mining purposes, and the little mineral there is interferes with a man's making permanent homes upon this land. They are afraid of being interfered with by persons who are engaged in mining.

Q. What about the timber land—what is the best method of preserving it?—A. Our people as a general thing here think that they have the right to get wood whether they own the land or not, and that they have the right to cut the timber just whenever they are disposed. I do not know of any means of protecting that timber without you place a man with a shot-gun at each tree. My idea is the timber should be sold with the land in reasonable quantities. I know of no way by which the government can protect the timber land. I think it would be better to allow it to pass into the hands of private owners. They will protect it better than if it belonged to the general government.

Q. That is the present system, is it not?—A. I believe so, to this extent, that there were some people appointed by the government to look after the timber land, or such lands as belong to the government. This was the case, I understood, some time ago. I do not know whether that law has been abolished or not.

Q. At present, can a man go and make a homestead of 160 acres and make a pre-emption of 160 acres more; is this sufficient for timber purposes?—A. Yes; I think that is sufficient. The great difficulty is to keep timber from getting into the hands of monopolists, for the reason that a man will pre-empt a claim and sell out his pre-emption. It is a very difficult matter to settle the timber question. These persons take it without any intention of completing the title. I have known instances where parties have gone out in the interests of other men and put up little cabins and located homesteads, and when the title was procured they turned it over to a speculator.

Q. Are these timber lands valuable for agriculture to any extent?—A. There are two or three different kinds of timber land. I speak only of the timber being cut.

Q. I referred to the timber at the south now, where there is slight rainfall.—A. I am speaking of the timber generally in the Sierra Nevada Mountains. The sugar-pine timber is very much sought after, for it is worth from $50 to $100 per thousand, and that timber is being destroyed very rapidly for market purposes. It is being cut down and shipped to this market, and to other cities and towns in California, for the purpose of finishing work. It is being destroyed and its timber utilized as lumber. Sometimes a whole tree is wasted to get a few shakes out of it, but these are exceptional cases.

Q. To what extent are the forests destroyed by fire?—A. I do not think there is as much fire now as in early days. In those days the Indians used to set the woods on fire every fall. I noticed lately, when I was up there last month, there was an immense growth of young trees coming up, about 25 or 35 feet high, and as thick as they could stand, and probably from 4 to 12 inches in diameter; and the larger trees are growing much thicker. I account for it by the reason of there having been no extensive fires lately.

Q. Do you think the growth of the timber would replace what is taken out for use in the industries of the country?—A. It will in course of time; but those large trees, I suppose, are one hundred and fifty or two hundred years old. They are cutting young growth upon Grass Valley for firewood, which they use at their quartz mills. I never thought that there was such an immense growth, but I account for it by the absence of fires.

Q. Are these lands valuable for agricultural purposes?—A. Some of them will raise elegant fruits, especially the foot-hills, well up, as high as Dutch Flat and that range, at an elevation of 1,400 to 2,000 feet above the sea. The timber is oak low down, and changes to a growth of pine as you go higher, and it is larger. It is the true pine.

Q. Is that belt of valuable timber valuable for agricultural purposes; *i. e.*, where the heavy pines are?—A. No, sir; not as a general thing. It is too high an elevation for the successful raising of crops. You can raise fruits there, but as to general farming operations there is not much in it. There are sheep up there in the summer time, for the purpose of grazing on the grass, but it is only for a few months. The chief value of this timber land is its timber. I should judge that the timber has been destroyed up to 2,000 feet, and along the railroad and other accessible roads. Between the North Fork of the American River and the Middle Fork it is all gone. There is a ridge there in which there is some sugar-pine, but all the most valuable sugar-pine is gone. Around Lake Tahoe it is almost all gone. It has been taken to Virginia City for the mines.

Q. The lands, then, are valuable for their timber chiefly?—A. That is all.

Q. What class of men want that land?—A. If that land was surveyed and in the market, it would produce good summer grazing four months in the year as a general thing. As the snow melts the grass springs up, and when you cut this timber away a new growth comes up quickly.

Q. What about the arable lands? What is the best system of disposing of them to secure the greatest number of actual settlers thereon?—A. The great trouble with most of the land arises from the absence of water. Away down in the San Joaquin Valley wherever they can get water they can produce very good crops, and as a general thing they have farmed it very successfully. I do not believe that poor men can pay high rates for water for irrigating their lands and make any money. It requires capital to bring in the water, and it can only be done by rich men. It would probably be most advantageous if the water could be brought to the land by some public system or by the general government. Then the land would produce very large crops.

Q. Have you paid any attention to the question of storage of water for irrigation purposes, or to the transfer of water rights to the possession of irrigating canal companies, &c.?—A. I do not know of any water in this State but what is taken up, as we call it, for irrigating or mining purposes. The tendency is to take out the water low down, and so it comes afterward to be an engineering difficulty as to what can be taken away from the land and given to others higher up. The difficulty in that matter is this: if you take the water out some man below you will claim his riparian rights and privileges, and will require the return of the water back into the stream.

The custom has been here that the first man who came along should have all the water he needed for mining or agricultural purposes, and the rule has been about the same. The waters that are taken out of King's River and Tulare Lake for irrigation purposes are continued along the plains a long way, and I am told the water is stolen, because the price is so high it would not pay for small farmers to buy the water to raise crops.

Q. What do you think of the pasturage lands? What disposition would you make of them?—A. I do not know. I don't know of any pasturage lands that are not taken up already, and I suppose they have procured titles. I think all the lands I have known of are in the hands of private parties now. I do not know how it is south of San Joaquin Valley; there may be such places; but in surveying the eastern boundary of this State I saw no land along from Oregon to the Colorado River that is naturally fit for grazing. Through the head of Death Valley and those deserts on the Mohave there is a little good land; but ouside of that it is a barren waste.

Q. Please go on with your statement about the *débris*.—A. I am the engineer for the miners' association, which sent me up to examine into this *débris* question and to ascertain whether the tailings from the mines could be taken care of.

Q. Tell us to what extent the tailings are destroying the land.—A. When I went up these rivers in 1849 they had very large bars or deposits in them at that time. When the miners came on they went to work digging the gold along these rivers with their picks and shovels, which loosened the surface material; that was the first *débris* that ran down these rivers, especially the Bear, Yuba, and American. It is only during late years that heavy hydraulic mining has been prosecuted to any large extent, say the last ten or fifteen years. Practically the mines are now in the region south of the Middle Fork of the Yuba, and they do wash down immense deposits into the South and Middle Fork of the Yuba. During the high stage of the water a great deal of that *débris* is swept into the river. Most of the bowlders and heavy rocks lie there, but the freshets sweep the light materials down into Suisun Bay.

Q. What was the condition of this river prior to its being destroyed by the *débris*?—A. Previous to that the rivers had tolerably high banks and there was some good land along them; the Bear River had probably the largest body, and that was very fine land. I myself had a ranch for fourteen years in that locality. The first overflow of this heavy *débris* came down as early as 1856 or 1857. During the freshets the rivers overflowed by reason of the *débris* in the mines filling up their beds, and the result of the overflow was that it injured some of the land. On one side of the river (the north side) they put up good levees; on the south side they failed to put up good levees, and the sand and *débris* ran over them and covered the land 5 or 6 feet deep.

Q. How long did it take to cover the land 5 or 6 feet deep?—A. At that time I suppose three or four winters probably covered it to that depth. It had been coming down from the early days of 1849, and it kept working down; and when the heavy freshets came it was washed out with great force and deposited where the river enters the plains, and that was the place where the sand and heavy deposits remain, while the lighter material continues working down. The purpose for which I went up was to examine and see whether this *débris* can be kept out of the rivers and retained in the mountains, and I have no hesitation in saying that it can be taken care of by making brush dams and diverting a large portion of the lighter material on to the red land. There are thousands of acres of waste land lying between the Bear River and the Feather River, and between the Bear River and the Sacramento, and between the Yuba and the Feather Rivers, where this lighter material can be run over on to the red lands, which are now entirely useless and unfit for cultivation. The red soil is but a few inches above the bed-rock, and by depositing this sediment there these lands can be reclaimed. My idea is, further, that there is no objection to leaving the coarser material, such as bowlders, cobble-stones, &c., in the river bed, where they will lie perfectly still, while, by running off the lighter stuff, we would fill up and cover these red lands that are now worthless and form on them with the deposits a soil three or four feet in depth. In addition to that, there is plenty of room to run this soil into the tules for many years to come. The lighter material makes a very good soil, and, in fact, on the Bear River they could never grow potatoes until the land was overflowed with slickings. In addition to that, the heavy material can be put into dumps, and during the winter season the freshets will continue down, the river will wash out, and, in course of time, this will help to relieve the present fill-up of the river. By putting in dams we retain all the heavy material in the river, and in the summer time can draw from the water thus dammed up.

In regard to the hydraulic mining business, I look at the question in the light that it would be very injurious to the country and the State to stop it. On that single ridge alone they employ a great many men—that is, the ridge between the Middle and South Forks of the Yuba, embracing the North Bloomfield Company. Their pay-roll is $2,000 per day, and all the people who live on that ridge are living there through the mining industry; and these very farmers who are now complaining of the *débris* find their markets in the mountains, and sell to these same miners every article they raise at a high rate of profit. This mining country that contains these gravel deposits is useless

for other purposes, and as near as I can judge it is 40 miles in width, and is probably from 18 to 20 miles in length. In the course of a hundred years there will be more land worked, but a large portion of this mining ground will never be worked by hydraulic appliances. In that portion where the bank is too deep—from 300 to 400 feet—it is generally drifted. I know of no other water than that which these ditches are now carrying that can be had, so that hydraulic working will be gradual and will not be overdone in that particular divide for the want of water. The people below now derive a great deal of advantage from this fact: that the mines store a very large amount of water in the winter time when the heavy freshets come down. The water they stop and store in the reservoirs amounts to over 9,000,000,000 cubic feet, that would otherwise come down the rivers. That water is furnished as required during the summer time.

Q. You are familiar with the ground occupied by the farmers; to what extent has it been injured?—A. If there had never been any hydraulic mining, the lands would still have been injured, and they were injured before the hydraulic mining commenced. The fact is this: as this material comes down, the bed of the river is being raised, and as a matter of course you must raise your levels correspondingly.

Q. If you find that the stream has cut its own channel, to what extent is the *debris* carried into the whole valley, and to what extent is it carried over the adjacent hills?—A. It is a very difficult question for me to answer, for the reason that there must be more or less from the plowed land or from natural causes. I know of some tracts that have been benefited by the *debris*, while others have been injured. Swamp lands have been benefited.

Q. Is it possible to divert that *debris* into the lands where it would be a benefit instead of an evil?—A. I think it can be. The red lands are perfectly useless, but by covering them with this sediment they will become valuable agricultural lands.

Q. Are there any swamp lands that might be filled with it?—A. Yes, sir; on the Sacramento River, near Marysville, there is fall enough to run these slickings off and fill up the swamp land; there is no doubt of that. The engineering problem is a very simple one. In turning it over in my mind, I was thinking there would be some objection to this from the people who are now complaining; that if you take the *débris* out into the river they would not ask you to turn it back again. I do not know that we could settle this problem without some legislative action permitting the water to be diverted from the river in order to carry this material to the different dumping-grounds. I have had a good deal of business with these people, and sometimes when they complain and you undertake to relieve them, they will complain that you are relieving them. I understand there is a proposition to change the present mode of surveys.

Q. What do you understand by that?—A. To change it from the present contract system into a paid one. My idea about surveys—and I have been in the business about twenty-eight years—is a practical one. We have had poor surveys because there has not been care enough taken to examine the men who obtain contracts before they go into the field. That is one thing. Then, again, the price has been cut down until in some places it is entirely inadequate to obtain a first-class man who is capable of doing first-class work. I know of sections of country that in early days were surveyed at a price of $12 per mile for sectionizing, $14 for townshiping, and $15 for standard lines. That was on the plains, and when we got to the little hills that were over 15 feet we discontinued the line, for the reason that it was impracticable to go over them. Since that time we have been very anxious to hurry on and go to the top of the mountains and sectionize the whole Sierra Nevadas; but when the government officials at Washington saw fit to reduce our compensation a good many old surveyors retired from the field. Hence you have got a lot of work which I am sorry to see is not in very good condition. As to putting a man under pay by the month, I do not approve of that, for the reason that while you may get several industrious men once in a while, the majority of them would want to do just as little work as possible. I would recommend that all men before receiving contracts should be examined by the surveyor-general as to whether they understood surveying and as to what practice they had. Even if a man came from West Point I would want him to go into the field with the surveyors six months before he was given a contract. I know many times we have had gentlemen fill the office of surveyors who were not practical surveyors. I think if the contract system is kept up the compensation should be increased in various localities. I think that in the mountains, as a general thing, no man can do accurate work under $25 or $30 per mile; and then there are some of those cañons that are 2,000 feet deep, and some of these surveyors don't know how to make a simple calculation of a triangle, or how to get across cañons. In places like that they can't be chained and they must be triangulated. That is the most accurate way to do the work; but the whole State is nearly finished, and I think it would be injurious to change the system now. I would be in favor of the government going on and surveying everything that they could sell, without waiting for a man to go in and make application and put up a deposit on two or three sections of a township, which leads to a great deal of trouble.

Q. Are you permitted to use triangulation?—A. Yes; under the present system we


MAP
SHOWING THE LOCATION OF THE
PRINCIPAL MINING COMPANIES
ON THE
BLUE GRAVEL CHANNELS
SITUATED IN
SIERRA & NEVADA COUNTIES
CALIFORNIA.
Compiled from United States Surveys by
P. HUERNE, C.E.
Scale 1 mile to 1 inch.
REFERENCES.
Ditches of Eureka & Yuba Cos Consolidated
Ditches of North Bloomfield G. M. Co.
Ditches of Milton Mining & Water Co
Omega Ditch
South Yuba Canal
Roads
Gravel Deposits
Central Pacific Rail Road
Creeks & Canons
Yuba River
Lakes & Reservoirs
Mining Claims
Number of Acres — figures in black
Elevation above Sea Level — figures in red. (small)
Township Sections — figures in red (large)
NORTH YUBA
GOODYEAR BAR
FOREST CITY
ALLEGHANY TOWN
MINNESOTA
EUREKA SOUTH
JACKSONS
ENGLISH MT.
FAUCHERIE RES.
SUMMIT CITY
SOUTH YUBA CANAL CO.
OLD MAN MT.
LAKE STERLING
MIDDLE
YUBA
RIVER
NORTH SAN JUAN
COLUMBIA HILL
NORTH BLOOMFIELD
RELIEF HILL
WASHINGTON
SOUTH
BIRCHVILLE
SWEETLAND
BELLS RANCH
MT. VERNON
GRIZZLY HILL
NEVADA CITY
SCOTTS FLAT
QUAKER HILL
LOWELL HILL
EMIGRANT GAP
DIAMOND CREEK
GROUSE RIDGE MT.
BLACK HILLS
DUTCH FLAT
BRIDGEPORT
PIES BRIDGE
T.19N.R.10E.
T.18N.R.9E.
T.18N.R.10E.
T.18N.R.11E.
T.18N.R.12E.
T.17N.R.8E.
T.17N.R.9E.
T.17N.R.10E.
T.17N.R.11E.
T.17N.R.12E.
T.16N.R.9E.
T.16N.R.10E.
T.16N.R.11E.
House. Ex. Doc. No 46.

use triangulation whenever it is necessary. An engineer should be allowed to use the triangulation system to get around obstacles. We have that right now, but we can't get pay for the lines thus run. Frequently men are permitted to receive contracts who are not competent to do this. If the pay was sufficient you could get a better class of men. In crossing mountains, as an engineer, I used to triangulate and chain, too. Under the present law I would do it that way still.

Q. If you should triangulate across a range of mountains would you charge for the lines and putting in the section corners all the way?—A. They then run back on the line and put the section corners wherever it is accessible. Where the country is very bad I always chain right on the slope and take an angle and rednce it. Generally, taking an angle on the ground and reducing it is very much better than leveling with chain and plumbing the pins.

Q. Does this law permitting men to do that extend all over the territory?—A. It extends over this. I know whenever we come to inaccessible places we use triangulation, and they pay us for it. We have always been in the habit of doing that.

Testimony of Albert W. Archibald, Trinidad, Col.

TRINIDAD, COL., *September* 6, 1879.

ALBERT W. ARCHIBALD made the following statement:

I have been employed since 1868 as United States deputy surveyor in Colorado, and am familiar with the area of the State south of Denver and east of the mountains, including the San Luis Valley.

I have heard the proposition in regard to the pastoral homestead in New Mexico, and I think that the proposition as suggested by Mr. Romero is a good one; that is, to give 3,000 acres as a pastoral homestead to actual settlers upon the condition that certain improvements be made; but I think it is not a good policy to require the irrigation ot any land on it or planting any trees. It has been suggested that trees ought to be planted. I think that the pastoral homestead is something that is wanted only for stock, and that it would be a hinderance for any person who takes it for that purpose to be compelled to plant any trees or make any improvements other than fence it. The only use that could be made of timber would be for fuel or protection from winds for stock, or as a shelter for houses. That would be the only use that could be made of timber, and there is not enough water in considerable portions of this land to irrigate timber. Most of the land could only be made available by springs that would not run any considerable distance, or by wells that must be dug at great expense. Taking the country from six miles east of Trinidad, following the mountains down to Cañon City, 180 miles, following the meanderings of the mountains, the country is underlaid with coal every place at about an altitude of 6,200 feet. There is no country above that altitude that has not coal in it. It is of excellent quality and will answer for fuel for all time. The croppings of the coal fissures will not fall short of 30 feet on thin perpendicular veins.

In Los Animos County there is 6,000,000 acres of land, of which not over 22,000 acres have ever been cultivated, and there is not water enough with the springs and artificial reservoirs that could be made at great expense to irrigate over 10,000 acres more. That is, it is not possible to irrigate over 32,000 acres of land in this county out of nearly six million acres. The length of the county is about 168 miles by an average width of 42 miles. In Huerfano County I have estimated the cultivated land there to be about 16,000 acres. Bent County does not exceed 4,000 acres of any irrigable land that has been cultivated up to this time. Greenwood County I am not so well acquainted with, but it has very little land that can be cultivated. Pueblo County is not cultivated to exceed 15,000 or 18,000 acres. Fremont has more than Pueblo, but I cannot state just how much. El Paso County has not water to irrigate 10,000 acres of land. Douglas County is at a much greater altitude than any other county and has a greater rainfall, so that a great deal more land can be cultivated in Douglas County in proportion to the permanent water than can be cultivated in any other of the counties I have mentioned. The water runs off very rapidly, but the soil is light and gravelly and retains the water. The particular points that I have referred to in regard to the improvement of pasturage homesteads I think should be taken into consideration in any legislation on that subject.

My conclusion is that this is a non-agricultural country, and my judgment would be that Colorado and New Mexico are pastoral and not agricultural countries. The best agricultural land we have is in the mountains, or rather at the foot of the mountains, between the elevation of 5,500 and 9,000 feet. The grasses at the foot of the mountains are invariably better than they are further out on the prairie on account of the springs and great amount of rainfall.

I think these pasturage lands ought to be sold by the government at a nominal

price, that is, at such a price as would insure their immediate sale and bring a revenue to the counties from them in the shape of taxation. I think the laws ought to be so arranged as to protect the actual settlers on the courses of streams or in the mountains. There are many places in the mountains where land can be cultivated without running water, for instance, on the slope of the mountains south of us. On the Raton Mountains there are many places where large amounts of oranges are raised without irrigation. I would classify these lands and I would say that all lands above an elevation of 6,500 in Colorado should be treated as agricultural or timber land, and that should be reserved for the actual settlers at 160 acres each. I think the pre-emption and homestead law is good in that respect. Perhaps San Luis Valley should be an exception. It is a broad valley without timber, has good grass and very good pasturage land, but no better than the average pasturage land down here. The grasses that grow below an altitude of 7,000 feet ripen perfectly, and are much better winter feed than any grass that grows above that altitude, and when you get as high as 9,000 feet the grass is only good for summer pasturage; that is, it will only fatten cattle in the summer-time; the growth of grass is heavy and is good summer feed.

I think that a system of triangulation surveys by which permanent monuments would be established, so that all subdivision surveys should be connected with them, would be a check to some of the irregularities that are now found in the present system of surveys. I think there can be some sort of permanent monument fixed at the intersection of each four townships. There are very few wooden monuments in the country that have been placed more than three years ago that can be found now. Stone or metal monuments are the only permanent things.

I am in favor of the present rectangular system, and am inclined to believe that the location of mineral claims in regular tracts would be an improvement on the present method. I think it would be a convenience to miners to be able to make their application for title direct through the local land office, and abolish these county recorders, and put it in the hands of the district land officers or their deputies.

The principal objection to allowing the pasturage homestead to extend over the mountains is because there are large tracts in the mountains that ought not to be allowed to fall into the hands of monopolists. If the pasturage homesteads were extended into the mountains there would be a great temptation to procure timber land as pastoral land, and the consequence would be that large tracts of valuable timber land would be purchased by speculators for speculative purposes and the timber would be of no value to the settlers.

I think that each deputy surveyor ought to use such a simple instrument as the aneroid barometer in his work, and I think it would be an excellent plan to have a geologist for purposes of classification.

There is one case in regard to the classification of mineral land where I think the settler is greatly wronged, and that is in the careless classification of mineral land whereby the settler is subjected to the expense (at this place it is $25 or $30) to prove the non-mineral character of land that is not actually worth that for any purpose. This might have been avoided by a proper classification by some competent person in the first place. The coal veins of Las Animas, Huerfano, and Fremont Counties are as clearly defined and as easily traced as the meanderings of the Arkansas River, yet on the assumption that the coal land extended over those areas to the east of it, the General Land Office has made an order withdrawing some twenty-five or thirty townships from entry as agricultural land till the non-mineral character of the land is proved. The consequence is that from $25 to $30 must be expended by each settler before he can file his declaratory statement and make his homestead entry. It is a great burden on the settler.

I would like to state that the pasturage lands of Mr. Romero are at a less elevation by 3,000 feet than ours, and the pasturage lands are better. Spring opens about three months earlier than than it does 90 miles west of that at Los Vegas, and those three months are good grass months.

Testimony of H. N. Arms, Trinidad, Col.

TRINIDAD, COL., *September* 6, 1879.

H. N. ARMS made the following statement:

I am a sheep-raiser in Colfax County, New Mexico, where I have lived for seven years. I own about 9,000 sheep, occupying about 8½ miles. I have 600 acres running along the Reta del Waalno Creek, which controls the water. I do not think Messrs. Wight, Beattie, or Jones put the amount of land necessary to sustain a sheep too high. Mr. Romero is a very intelligent gentleman, but he has peculiar ideas about miles. They are certainly not my ideas. I think the pasturage homestead a good thing if you make it large enough. I think 20,000 acres of pasturage land would equal 160 acres

of good agricultural land. I think the government ought to sell this land, protecting actual settlers. I think 10 cents would be a fair price for pasturage land per acre. My county is very well stocked. I run 5,000 of my sheep 100 miles below me to get grass. I have got water there. I have been very pleasantly situated myself, and my experience has been that we get along very nicely with the sheep and cattle together.

The average price of Mexican sheep is about $1.50 apiece. My sheep are improved—improved first with cotswold, and now I am improving by degrees with merino, and the result is a very good grade of fleece weighing nearly five pounds to the sheep. If we were allowed to own our land it would tend to greatly improve the quality of our stock, both cattle and sheep. The people have an unsettled feeling and I think the peace and prosperity of the country would be greatly increased if these land questions were settled.

It takes from 3 to 5 acres to support one sheep. Three acres would be the minimum, and 5 acres would not be too high an average. The profit on 4,000 sheep is about $2,000 per year—that is, for the wool—and the increase would be about $1,000 more. Wool for the last three or four years has been very low. There are expenses attending shearing, lambing, and herding a band of 4,000 sheep, and the labor for a ranch, compared with that which a man has with farming land, is not under, I think, 20,000 acres of arid land, is equivalent to about 160 acres of agricultural land. There is also a large additional expense for living here. The farmers in the States feed themselves, whereas here a man does not raise anything; he must go off and buy it. There are many expenses here that do not exist in agricultural districts. The expenses of many men during the lambing time are very great. They have to have one man to every 100 sheep. Our ranges are very often 30 or 40 miles from a post-office and we are deprived almost wholly of social and school privileges.

Testimony of Charles C. Baldwin, United States deputy mineral surveyor, Leadville, Colo.

In the matter of "variation" connected with the United States mineral surveys, producing confusion in lines and boundaries and resulting in litigation, I note a case in point. I have noticed in the last fifteen months, in the surveys of mineral claims in this district, great inaccuracies, viz, one case of many similar ones: two deputy surveyors, in running the lines of two claims, parallel, made a difference of variation of some 40 minutes, resulting in a strip of land between the two claims of, say, 18 feet in width at one end and 1,800 feet in length, giving a capital opportunity for law-suits and depriving both of the adjoining claimants of a portion of their claims; and sometimes they lap over, and sometimes they leave this vacant—the strip. This results from the employment of incompetent men as deputy surveyors, men who do not know how to use the solar transit. The district land office at Leadville has official record of several cases as above set out. Remedy: that in all mining districts a base or meridian line at least one mile in length should be established from astronomical observation, and that all official surveys of mineral claims should be run from this point, using it for obtaining the true course of all side lines of mineral claims, and when mineral-claim surveys become extended over a large scope of country, to make secondary base lines from the first. I want to do away with connecting mineral claims with township or sectional corners, because our mineral-claim surveys are accurately made, and the rectangular system, as now made, is inaccurate. Under the present system of rectangular survey, in a few years all corner stakes and marks soon disappear.

Testimony of R. C. Beattie, Trinidad, Colo.

TRINIDAD, COLO., *September* 6, 1879.

R. C. BEATTIE, sheep-raiser, made the following statement:

I have owned sheep in California and New Mexico. Mr. Goodwin and myself have between 1,100 and 1,200 head of sheep. I think, judging from the ranges we have occupied, that it would take fully 3 acres to the sheep. I am not a cattle man, but I think it would take to one beef—that is, one beef would consume as much as 8 or 10 sheep, and I think it would require in a range all of 3 acres to sustain a sheep. I do not believe that the grass is injured under sheep pasturage. I think there is a prejudice between cattle and sheep men, and I think it would be very much better if we were permitted to buy our ranges. I think we could raise more and a better quality of sheep if we had our ranges to ourselves and fenced in; it would increase the value of the land and herds. We would then breed differently. Instead of raising sheep with a clipping of 1¾ to 2¼ pounds to the sheep, if we owned the land and controlled

it we would grow a sheep that would clip from 3½ to 5½ pounds. The disposition this year is to buy the improved merinos. There is a great demand for a better class of rams. I have had for sale here for three or four years a real breed of merino sheep, but it has been a struggle to introduce them. The objection has usually been this: that merinos do not herd well with the native sheep, and that all eastern sheep have to undergo a process of acclimation that very frequently causes loss. In addition to this the merino sheep have not been accustomed to roaming or traveling for their food, and in this high altitude it seems that in acclimating them they get a fever that is very fatal to a great many. I speak in reference to imported stock.

I value the average herd here at $1.50 per head. I think, under a fencing system and owning their own land, that the value of the herd could be more than doubled. There is a demand now and sale for (principally this season) an improved heavy sheared, well-graded merino ewe. Parties are now unwilling to purchase the poor Mexican ewe. From the fact that you do not own your lands it makes an uncertainty in the business that is very hurtful to it. It is the bane of the business, and has greatly tended to retard the improvement of herds. Parties have no titles to their ranges, but hold them by common consent, and they are often in dispute. We find that it takes a large range, that we have to control a large amount of territory, to run from 10,000 to 20,000 sheep. I have a range perhaps 4 miles one way by 7 miles another for 10,000 or 11,000 sheep. I would buy this land if I could at the nominal price of 10 cents an acre. I think the pasturage homestead rule would be a good thing for the settlers and the government, if the stockmen were protected, by allowing them to purchase land to the extent of the stock he has on hand at the time of entry. I think it would be a fatal blow to the stock-growing interest of the country to restrict a man from getting hold of and controlling a sufficient quantity of land to grow and sustain the flock he has at the time of the passage of the act. I do not think New Mexico can ever be an agricultural country, and I have been over a very large portion of it.

I think Mr. Romero's statement concerning irrigation is correct; I think New Mexico is not yet overstocked, but will sustain more and better stock. The greatest difficulty is the running over each other's ranges and thereby causing ill-feeling. If these questions are not settled they will lead to serious difficulties and trouble. I am satisfied of one thing: that the homestead law that applies to the agricultural land of the public domain is wholly inapplicable here; I think the other one would be better.

This difficulty is frequently arising on our ranges: a man gets title to 160 acres of land where there is water for three months in the year, and this temporary water will enable them to ruin your range. We cannot claim that they are legally trespassing upon us, but they are in reality violating rules that we observe among one another—a sort of conventional rule among ourselves respecting each other's ranges. Owning this temporary water they can come there with their stock and eat off the grass. I think that parties engaged in raising stock should have the privilege of getting hold of large tracts, not with the purpose of monopolizing the land, but for the purpose of getting title to it that they may protect their herds and have as much pasturage for them as they have now, when we have a tacit understanding that these ranges belong to us.

I think the pasturage homestead in New Mexico ought to comprise 5,000 or 10,000 acres, and the government ought to give that much to each settler. I do not think it would be a practicable financial proposition to fence this land; we would have to depend largely upon herding. I think there is a great deal of land in New Mexico that would hardly pay for fencing. This is one reason why, in the future, this land must of necessity be entered in large quantities. I see no reason why the law should not provide that herding would answer as well as fencing, because fencing will many times be impracticable.

I wish to explain a former statement I made concerning my range and the number of sheep there. My range comprises about 28 square miles, or 16,000 or 18,000 acres, but all our 11,000 sheep are not pastured there; not more than half of them are kept on this range; I do not think the range would support that many sheep; the remainder of them are kept 15 or 20 miles from there. This, you see, would support my statement that each sheep required about three acres of pasturage.

Suggestions to the Public Land Commission by Hon. James B. Belford, M. C., Central City, Colo.

CENTRAL CITY, COLO., *August* 18, 1879.

DEAR SIR: I am in receipt of the letter issued by the Public Land Commission, of which you are a member and secretary, and in which you invite me to communicate to you any suggestions which I might desire to submit touching the proper method of disposing of the public lands. I am aware, and have been for a long time, of the im-

portance and necessity of a radical change in the system governing both the location of claims upon the public lands and also in the manner of their disposition and sale. For a number of years the Land Department at Washington has admitted that the climatic and physical conditions attending that large body of land lying between the one hundredth meridian on the east and the Cascade Range and Sierra Nevada Mountains on the west, and from the Mexican line on the south to the international boundary on the north, carried it out of the operations of the pre-emption and homestead laws. The attention of Congress, in at least three instances, has been called to the necessity of adopting a new system. Both the present Commissioner of the General Land Office and his predecessor have urged upon Congress the necessity of authorizing the immediate offer for sale of that body of surveyed land lying west of the one hundredth meridian, and the part remaining unsold to be subject to private entry at $1.25 per acre. Of course this would carry us one step in advance of the present position, but in my judgment it is of questionable expediency, for the reasons which I shall now proceed to enumerate.

If these lands were agricultural or arable in character in the sense that the land lying between the eighty-first to the ninety-fifth degree of west longitude is, or if it could be made so by irrigation, we would still have to encounter the vital question which overshadows the whole subject, namely, from whence is the water supply to be derived? Irrigation is indispensable to production, except, possibly, in the immediate vicinity of some of the streams. I take it that the present water supply is not commensurate with the body of land to be watered, and all such as cannot be watered must be taken out of the list of arable and placed in that of pastoral land. First, then, as to the disposition of the pastoral lands. Their value will depend upon the facilities for obtaining a needed supply of water for stock, and also on the climatic conditions; and yet the policy suggested contemplates that all this land, without regard to its proximity to or its remoteness from water, shall be rated at the same price, namely, $1.25 per acre. It will be perceived that land which lies five or ten miles distant from a stream or spring of water sufficient in volume for a herd of stock is to be sold or entered at the same price demanded for that on the border of the stream or spring. Such a system lacks both the elements of justice and equity. The same is true of land capable of irrigation, because its value will also largely depend on the expenditures required to subject it to water.

But there is another objection which I have heard urged by men engaged in pastoral pursuits, which, if acted upon by them, will defeat the policy of sale. At present their cattle roam over these sterile plains without cost to the owners for use or occupation. If they become vested with the title to the land it immediately becomes amenable to local taxation, and this they say will be a grave and serious burden to one owning a large herd and utilizing a large tract of country. So long as they can use the land without cost and free from local taxation they certainly will refrain from purchasing it. It occurs to me that a uniform rate per acre is neither wise nor just. Land on the banks of a stream is worth more than land away from it. Let the government fix a maximum rate, say $1.25 per acre, and then scale down the price as the land is near or remote from the facilities that can make it available for use or occupation.

There is another phase of this question which reflection has led me to regard with favor. I mean the leasing of the public domain in tracts ranging from a thousand to ten thousand acres. Men who refuse to buy because of the burdens of local taxation would be willing to pay a nominal rental, say five cents per acre. They would be willing to do this for a number of reasons, among which I enumerate the following: First, it would enable each man to protect his own range against the cattle of his neighbor; second, it would terminate the hostilities which exist between the men who own cattle and those who own sheep, for the owners of each, having an interest in the soil, could legally protect it from the invasions of the other; third, having an interest in the soil, the proprietor would feel justified in entering upon improvements, if any could be made.

This leasehold system, as you are aware, is not new. It has obtained in reference to the Crown lands in New South Wales since 1861, and in the Queensland colony since 1868. It may be said that such a system would work a complete innovation in the land policy of the United States. I concede this, and then answer that it is not the first innovation. Originally the government regarded the public lands as a fund out of which it derived its revenues and as a means by which it met its necessary expenses. This policy was abandoned and one looking to the securement of settlements on the public lands adopted. This change was evidenced by the inauguration of the pre-emption and homestead system. The Land Department at Washington now admits that the pre-emption and homestead system is no longer applicable to that large body of land lying west of the one-hundredth meridian. A change is admitted to be necessary. We are now forced to take a new departure, and it occurs to me that the leasehold plan is worthy of grave consideration. Rating the entire body of land at $1.25 per acre and fixing the rental at 5 cents per acre would give the government an

interest of 4 per cent. on every acre rented. This amount men desiring to occupy the land with their herds would be willing to pay for the security they would derive from their leasehold interest in the soil. Under this plan the government would derive a revenue, whereas at present it receives nothing.

I now desire to call your attention to another matter which I deem worthy of public consideration. In a report made by the Commissioner of the General Land Office to the Secretary of the Interior, November 1, 1876, the following language is used: "Under a system which would justify large expenditures and insure the utilization for purposes of irrigation of the whole volume of water reaching the valleys from the mountain streams, but a mere fraction of the whole great area could be made fit for tillage." It is admitted herein by the officers of the government charged with the custody and disposition of the property in question that there is no present supply of water adequate for the reclamation of these arid lands. Are they to remain forever a waste? Will the government undertake their reclamation? If so, what plan shall be adopted? I have heard a number suggested, and among them the donation of the alternate sections of land to the individual or corporation that would subject them to irrigation. It occurs to me that the government might wisely appropriate at least half a million of dollars to be used in sinking artesian wells at various points in search of the needed water supply. If it can be demonstrated that water can be obtained in sufficient quantities by sinking these wells, you at once add immensely to the value of the land and establish the possibility of ultimate settlement upon them. Here, then, are two prospective advantages immeasurable for good in their results and of incalculable effect on the destiny of this vast region of country. As the land is the property of the nation, its reclamation should be a matter of national concern. Could this land be made available for human habitation by the obtaining of water through the agencies I have named, no man could accurately predict the mighty and beneficent results that would be reached.

The enterprise is in every way worthy of the favor of the government, and is the only method offered by the present for the making available for human habitation this great domain. The State cannot be expected to execute this undertaking for it is not the proprietor of the soil. If, however, Congress should treat these arid lands as it treated the swamp and overflowed lands in 1850, donate them to the States in which they are found, we could then look to our local authorities to take some action of the nature above suggested. I am not hopeful of such action on the part of Congress. And therefore press the subject on your attention. In conclusion my suggestions are: 1st. That if the land is to be sold it should be in tracts of from 160 to 10,000 acres. 2d. That the maximum should fixed at $1.25 and the minimum at 10 cents per acre, dependent on the location of the land with reference to water and the possibility of its irrigation by ditches. If leased, then it should be leased in tracts of from 1,000 to 20,000 acres at a nominal rental, and for at least a ten years' term.

In either event whether sold or leased the government should appropriate half a million of dollars, if so much be necessary, to be expended under the direction of the Secretary of the Interior in sinking artesian wells at various points to the end that it may be demonstrated whether or not water can be obtained.

I have reserved the other matters submitted in your letter for a future time.

Very respectfully, yours,

JAMES B. BELFORD.

Captain C. E. DUTTON,
Secretary Public Land Commission.

Testimony of Dr. M. Beshoar, Trinidad, Los Animas, Colo.

TRINIDAD, LOS ANIMAS COUNTY, COLO., *August* 30, 1879.

Dr. M. BESHOAR made the following statement:

The stock owners about here own large herds that sustain a number of persons, and I think it would be well to sell the land in large bodies. It is supposed under the homestead law that 160 acres of land will be sufficient for a farmer's family, but here the proprietor of one herd often supports twenty families. I believe really that the best policy would be to sell the land at a reduced fixed price without limit. My reasons are: first, that the land is not as valuable as agricultural land, and therefore will not be taken up as agricultural land; second, that stockmen will not, at any price, be likely to buy more than they need at present or that they will probably need in the near future; and third, that if a stockman found that he had more land than he would probably require, rather than pay taxes upon a large body of land he would sell it to other stockmen. The water rights are not all taken up in this county, and I do not see how the selling of the land in large bodies could affect the small owners unfavorably.

The average amount of grass necessary to fatten one beef for market would be 25 acres, and I do not think this amount varies much from year to year. I am sure that an amount not exceeding one-fourth the value of cattle owned in the county is returned for taxes, and of the cattle grazing in the county not one-half are given in. This is the same way with sheep, except there are not so many in the county not listed for taxation.

I think it would be of vast advantage to the stockmen to have the land fenced, as it would give them an opportunity to improve their stock and protect their grass; and the sale of the land in large tracts would be of advantage, on the ground of making more taxable property.

There are comparatively few agriculturists in this section of the country, and I do not think any person makes a living upon agriculture exclusively. Irrigation is carried on to some extent, and it does not injure the land, but improves it from year to year. All the land that can be irrigated in the driest season of the year is now under irrigation, and unless the water was husbanded in reservoirs for the purpose the area could not be extended.

There is trouble here between the sheep and cattle men. A great deal of animosity is developed, and frequently bloodshed and violence. The sheep injure the grass if kept on it long, and cattle do not graze well upon ground over which sheep have recently been grazed. When they tried to raise sheep and cattle on the same range here it failed. Most of the land in this region is arid, except the narrow valleys along the streams, which is irrigable agricultural land.

I think that 5 sheep to 25 acres or 5 sheep to 1 beef would be about a right proportion; but I do not think that allowance would improve with sheep on it, while with cattle it might improve some. Sheep are more destructive than cattle.

Owing to the uncertainty of tenure there is trouble threatened all the time, and I think this land question ought to be settled as soon as possible. Stock raising now is a sort of battle. For instance, the sheep men claim that it is public domain, the land of the government, and that they have the same right upon any portion of it as the cattle men have. A cattle man will select a range, and the sheep men will come along and say that they have a right to range their sheep there as it is public land, and very frequently they will take their herds in upon the ground of the cattle man. The result is, of course, violence, and murders are not infrequent, while much stock has been destroyed by these jealousies. The cattle men drive the sheep up together and then ride over them, killing many of them, and there results a sort of "shot-gun policy," which makes bad blood and disorder. Then many of the sheep have their throats cut. On one occasion as many as five or six hundred were thus killed. This is sufficient to illustrate the bad feeling between the two classes.

I tried farming on my place in this county, and I found I could bring things from Kansas, all expenses paid, for less than one-half of what I could raise them for. I kept account of my expenses and found this to be a fact.

Testimony of J. L. Brush, cattle-raiser, Greeley, Colo.

J. L. Brush; resides at Greeley, Colo.; is the owner of a herd of cattle numbering nearly 4,000. He is of the opinion that it is unadvisible for the government to open the arid lands of Colorado to private entry in large tracts, or even in tracts of moderate size capable of supporting small herds of cattle. If this were done the land would be purchased by numerous persons, whose only object in so doing would be to sell it to large capitalists and to owners of great herds if the price were low enough. Such persons would be the herdsmen employed by the great cattle owners, or other men hired by them to obtain titles to such tracts of land. If the price set by the government were too high it would not be sold, and the law would be practically inoperative. If the price were low enough to tempt purchasers those tracts which might be purchased by individuals in small holdings would quickly concentrate in the hands of large owners.

As a general rule the large cattle owners would probably like to own the lands in very large tracts on which they would pasture their cattle. The small cattle owners cannot at present afford to own them. Whenever the government is ready to part title to its arid pastoral lands the large cattle owners will be the first who would seek to acquire it. And if they want it they will get it as soon as the government is ready to dispose of it. The effort to prevent them from monopolizing large tracts would be useless. Experience has already shown that the present homestead and pre-emption acts and the rules of the land office are no obstacle to them in acquiring large tracts of land along the courses of rivers. The ordinary price of $1.25 per acre is not too much for these lands, because by controlling the water-front they control also the land adjoining for an indefinite distance from the water. They obtain these lands by causing their herdsmen to file upon them and take out patents, and they pay all the

expenses and obtain from their herdsmen deeds of the land. Much false swearing of course is resorted to, but the patents are obtained nevertheless. Small owners could not afford to buy land in a similar way, and hence the larger owner is the one who is most interested in acquiring the land. Opening the pasturage lands to private entry, therefore, would have the effect of concentrating them in the hands of a very few cattle kings. A limitation of the quantity to be sold to any one purchaser would amount to nothing, because the man who wanted to acquire an immense tract would simply get a sufficiently large number of men to enter the land in their own names and sell out to him. Perjury would be no obstacle, any more than it has already been to the acquisition of very long lines of river-front.

I think the bringing of these lands into market at a low price would be disastrous to the cattle interests of Colorado, because it would tend to exterminate the smaller cattle owners. So long as the land is public land every man has an equal right to pasture his cattle on it, and the stronger cannot easily drive off the weaker, or at least they have not often attempted to do it. According to present customs and almost universal comity prevailing throughout the State, the larger owners as a rule do not prevent the smaller ones from watering their cattle at their river-fronts and water-holes, and in the general "round-up" of cattle every man takes care to bring in every other man's cattle. The interests of the large and small owner are so intimately interwoven that the neglect of these customs and comities would be detrimental to both. It might perhaps be more detrimental to the smaller than to the larger owner, but it would be sufficiently so to the larger to keep him under a constant inducement to observe them. If, on the other hand, large cattle owners are to become also monopolists of large tracts of land, all such community of interest ceases. The only interest of the monopolist would then be to keep other people's cattle off his land, and his right to do so would then be perfect. The result would be that cattle-raising would be almost if not quite impossible on a small scale.

Under existing laws I am of the opinion that there is no greater tendency for the cattle interest to concentrate into the hands of a few cattle kings than there is for any manufacturing business to concentrate into the hands of a few individuals. Undoubtedly the owner of a large herd can raise cattle at a smaller cost per head than the owner of a small herd. So can a large manufacturer produce, in the long run, somewhat more cheaply the same kind of products than the small manufacturer can. That is a consequence of the natural laws which govern industry, and it is beyond the reach of legislation.

Instances have occurred where, under the present system, small owners have been crowded out by larger ones. Some large owners are mean and avaricious enough to use the great resources which they undoubtedly possess to crowd out weaker men. They may instruct their herders to leave behind the cattle of their poorer neighbors in the general round-up. They may sometimes drive the cattle of the poorer men away from their rivers and water-holes, and by keeping them moving run them down in flesh, and may resort to many devices and tricks to injure them, and ultimately compel them to sell out or emigrate. But I believe such practices are not common, and when they do occur are injurious in the long run to those who resort to them. Although some men are driven out of the business and discouraged, there are plenty of others to take their places and begin the business as small owners.

In answer to the inquiry whether the acquisition by cattle men of very large tracts of land along the water-fronts of streams has been injurious and oppressive to the people of the State, I should say in general that it has not often proved so hitherto. The owners of such tracts have not, as a rule, undertaken to avail themselves of their ownership of these long tracts to keep the cattle of other men away from water, though it is generally conceded that they have the right and power so to do if they choose. Possibly they may think it for their interest to do so at some future time; but when they do it will be time enough to take action in the matter. I am of the opinion that if such a difficulty ever occurs it could be reached about as well by State legislation as by national legislation.

I do not think that the extension of the homestead principle to the occupation of pasturage lands would be beneficial. It would be open to objections the same in kind, though perhaps less in degree, as those which I have stated would appertain to private entry or pre-emption. A person homesteading a tract of 1,000 or 2,000 or 3,000 acres of arid land might be a herder in the employ of a great cattle king, and fifty or more of such herders might homestead as many contiguous tracts, and for a nominal consideration the cattle king would be enabled to occupy them as much and as exclusively as if they were his own. The homestead privilege would rarely be availed of by any man for a *bona-fide* occupation for the purpose of acquiring a permanent residence, but if taken up at all it would be taken merely for the purpose of holding the land under a temporary possessory title in order to keep other people off from it and to secure the benefits of such occupation exclusively to the greater cattle owners. If any one were to take up such a homestead with *bona-fide* intentions, and for his own personal use, his situation would be an unfortunate one. I repeat here that the whole

pastoral industry of the State is conducted upon the assumption that the land is public land and open to every man alike, whether rich or poor—whether he owns 5 head of cattle, or 500, or 50,000. Every man who pastures there considers it for his own interest to take care of every other man's cattle, and this common care of each other's property is the life and soul of the entire industry. If that understanding were to be disregarded the whole pastoral system of the State would go to pieces. Now if a man homesteads a tract of two or three thousand acres he must fence it, to keep off other herds. His very object in homesteading it would be to keep every other man's cattle off from it. He thus puts himself outside of and in antagonism to the general comity and mutual help and co-operation, in conformity with which the entire pastoral industry of the State is conducted. He could not sustain himself in such an attitude. Nobody would bring in his cattle in the spring, nor would anybody permit his cattle to range with theirs. He must open his fences in winter to allow cattle to drift with the storms, and the result would be that he would lose them.

I think the present condition of affairs is better than any of the proposed changes. I believe that the poor man has a far better chance to make a start with a few cows and gradually acquire a moderate herd, than he could possibly have if the land were allowed to pass into private ownership. As soon as the law opens the way the large owners will get it all and exterminate the small owners. We should then have the same state of the cattle industry as that which now prevails in Texas, where a very few men own all the pasturage land and where small owners are unknown.

I wish to say that so far as my own interests are concerned there would be no injury done to me if the lands were open to entry. I am neither a very large nor a small owner. I should at once buy every acre of land along the streams which I could lay hands on, unless the price were too high, and should secure the largest tract I could cover.

The foregoing testimony was fully concurred in by Bruce P. Johnson, owner of 7,000 cattle; O. P. Gale, owner of 1,000 cattle; H. W. Twombly, owner of 500 cattle; S. F. Whitney, owner of 350 cattle; —— Pinneo, owner of 300 cattle; George H. West, owner of 2,000 cattle; all of Greeley, Colo.

Testimony of William K. Burchinell, Leadville, Colo.

LEADVILLE, COLO., *August* 25, 1879.

WILLIAM K. BURCHINELL, receiver of the land office, made the following statement:

Question. Mr. Burchinell, you have heard the opinions of your colleague as to the proportions of the various classes of land in this district; is that in accord with your views?—Answer. I think as a rough estimate it is about right. I corroborate his statement.

Q. Do you agree to his statement in regard to the agricultural lands; meaning thereby land capable of raising cereals?—A. I do.

Q. The timber lands also?—A. Not altogether.

Q. Please state any views you may have in regard to timber lands?—A. Well, the land in this district has only been subdivided into two classes, that is mineral and non-mineral, and there are very few instances, in fact I cannot recall one within my knowledge since I have been in the office, where the whole tract was taken up for the purpose of securing the timber. Of course, a ranchman in locating his ranch desires to have some timber on it and will take some timber, while the major portion of the land will be prairie or plains, or whatever you may choose to call it. There was quite a great deal of this land, referred to by Judge Henry, in 1872. It was generally supposed to have been a fraud perpetrated at the time of those entries, but of which we know nothing at all, as that was before our time. We came here, in this office (not in Leadville), in 1875. We have no personal knowledge of that at all, but since we have been in the office I do not think I have ever known the entry of a timber claim to be entered and "proved up."

Q. What do you know in regard to the destruction of timber?—A. I know that there has been a great deal of useless destruction of timber all over the whole district, and it is something that requires vigorous legislation and laws to prevent it, from the fact that miners are reckless with timber always.

Q. Is there any effective restriction upon this destruction in this district?—A. There has never been any to effect anything.

Q. It is, then, simply destroyed at the will of anybody, without benefiting the government?—A. Yes, sir.

Q. What would be your recommendations in relation to timber lands, if any?—A. I do not know that I have thought a great deal about it, and hence I have not arrived at any definite conclusion in regard to it. In Colorado, here at this high altitude, there

should be some restriction made to preserve the timber, at least prevent the wholesale destruction of it, that is, cutting it all down, from the fact that when the timber is once destroyed it will take a long time to grow up again. On the lower altitudes the trees will grow up in 50 or 60 years, but on the high altitudes it will take a thousand years, you might say, for the trees to arrive at the same dimensions, because it is above the line of humidity. If there could be any legislation or enforcement of any of the present laws to prevent this wholesale destruction I think it would be a very good idea.

Q. Is it not claimed that when timber is cut down it becomes the lawful property of the person who cut it down?—A. That is so. Mill men now claim that, under a late enactment allowing them to cut timber for mining purposes, they are only acting under the law in cutting off this timber, because it is mineral land, and there is no way of disposing of it, and they are entitled to use it so long as they do not take it out of the district or transport it.

Q. That it covers mineral land?—A. Yes, sir.

Q. In your opinion the present laws are inoperative and cannot prevent this wholesale destruction?—A. Entirely so.

Q. Are the register and receiver vested with any power to stop this destruction?—A. None whatever now.

Q. Are there any other officers in this district who are vested with power to do so?—A. Under a late enactment there have been sent out from time to time special agents, under instructions from the Commissioner, to look after this matter.

Q. Have they any power to check this destruction?—A. They have not. They have instructions to see the parties who have trespassed, but they have no authority to make settlements.

Q. That trespassing relates only to timber cut for transportation?—A. Yes, sir; that is my understanding of the law.

Q. You say that your understanding of the present timber laws is that the only trespassing that could be done upon the government is when the timber is cut off for the purpose of exportation or public sale?—A. Yes, sir.

Q. You agree to the proportionate amount of pastoral land in your district as stated by your colleague, Judge Henry?—A. Yes; I think he is correct.

Q. What is your opinion of the applicability of the present land laws to the disposition of these lands? If they are ineffective, state how.—A. Taking them as a whole I think in a district such as this, that has been settled for a number of years—upward of twenty—and where all of the most available as well as desirable lands have been taken up, that it would be to the interest of the government and to the interest of the citizens and residents of the district to give them a chance to buy all the land at private entry; that is, have it offered by proclamation of the President. The present pre-emption laws would still be operative upon these lands, and when parties desired to take larger tracts by paying the price they could do so.

Q. State your reasons for that.—A. Here the streams have all been located on both sides. And there is a great deal of land that lies up back of the streams that might be sold if they were allowed to take large bodies of it, say one or two thousand acres. You could then afford to go to the expense of going off a couple of miles and bringing in the water through a ditch and irrigate all your land, while with only 160 acres of land you could not afford to go off and make a ditch worth three or four thousand dollars. I think a man ought to have as much as he wants, that he might irrigate it and make it productive.

Q. Could a man have a successful stock farm upon 160 acres of land?—A. Not in this district.

Q. What, in your judgment, would be the number of acres required to each head of beef in this district?—A. I think that Judge Henry's estimate is low enough. There are a great many things to be taken into consideration. There are years when I believe 8 acres would do, but when we had a hard, cold winter and dry summer I think it would make an ox very hungry; while if we had plenty of snow and a wet spring, then 8 or 10 acres might do, but I think it would take more than that.

Q. Taking the average year, what would be the average amount of acreage required to each head of beef?—A. I do not think I should set it at less than 12 acres.

Q. Would not the grass-bearing capacity of the land decrease year by year by pasturing?—A. It does annually by tramping it out; at least I have heard our stockmen there in the park claim that it was gradually decreasing from that cause.

Q. Should they not have an increase of acreage for each beef?—A. Undoubtedly.

Q. Would you sell these lands at private entry without limit?—A. Yes, sir.

Q. What security would you then have against monopoly?—A. I think the previous entries would prevent that.

Q. What chance would small men have to buy anything?—A. The same chance that he has now. We have some townships now in our district that are subject to private entry, and they are upon good available land; there don't seem to be any monopoly there, and I don't think there is any particular danger of any one taking up or entering a

great deal of land in this district. These lands are of more advantage to the men that own the streams than they possibly can be to any one else. A man cannot afford to buy this arid land unless he can get to the stream. I have no fear whatever of a monopoly; I have not the least idea that there would be anything of the kind.

Q. What, in your judgment, would be a fair price for this land, upon an average?—A. Well, I would set the figures much lower than Judge Henry did. Our best lands along the streams have been disposed of for $1.25 per acre; the best of the land generally lies along the streams, from which they can cut hay that pays as well if not better than raising grain; in fact, men have made more money on a range in a year than many of the farmers in Pennsylvania have made in two raising grain. Then those lands that lie up back—thousands and thousands of acres of which is not fit for anything in the world but stock ranches—they are too high for irrigation, and all they have to depend upon is snow and rain; for these lands I do not think we ought to ask more than fifty cents an acre. There has been more desirable land disposed of for less than that.

Q. Where do those townships referred to in your previous answer lie?—A. They start from the Upper Platte River, running north 18 miles. They are all in Park County, and all subject to private entry, but the land cannot be used because there is no water.

Q. How many acres are there in South Park subject to private entry that have not been entered?—A. I should think that there are six townships, perhaps; there are 8,000 acres in each township. I should say, then, 500,000 acres not taken in South Park, subject to private entry at $1.25 per acre.

Q. And the fact that the streams have been taken up by settlers prevents the people from getting water upon them?—A. Yes, sir; that makes them entirely unavailable for anything. There are some too high, and there are others upon which the people back of them control the water, and hence cannot be irrigated.

Q. In the humid region they suppose that 160 acres will support an ordinary family by the tillage of the soil. Can you tell me how many head of cattle would have to be kept upon a farm, the increase of which would entirely support an ordinary family here in this pasturage country, supposing you were to allow them to take a homestead upon this pasturage land and they depended upon the cattle alone? How many cattle would it take to support an ordinarily economic family?—A. Well, I think 100 head.

Q. In your experience as receiver, what is the situation in regard to government stakes or corners?—A. That it is a notorious fact that when any party wants to locate a ranch they have to employ a surveyor at considerable expense for a day or two to find any corners, and they will come nowheres near where they want to locate. They may have to go off miles then, without finding the corners sometimes, and at other times they are destroyed or have been moved out of place, or not preserved at all. Right here are townships that have been surveyed within one year, and it is almost impossible to find the corners now. The stakes are gone or were never there. I have never been there myself but I have heard so much complaint.

Q. So that when a man has purchased a quarter section of public land he has yet got to make a survey independent of the government survey?—A. He has. In fact we have always advised it for the sake of accuracy without that a man may go ahead, make his improvements, and after having done so he may have some one come along and tell him that it is not where he thought it was. It is better to make a little expense than make the changes afterwards.

Q. You heard Judge Henry's statement as to the operation of the mineral laws in this district; have you anything to say in relation thereto?—A. I have several ideas that I should like to advance.

Q. Are you practically familiar with mining?—A. I am to a certain extent; that is, I have paid a great deal of attention to mining. I have had a great many and been in a great many mines in company with men who were experts.

Q. Are you familiar with mining litigation?—A. Yes, to a certain extent.

Q. Can you state what, in your opinion, is applicable to the present mineral lands or mines in this district?—A. Well, I have a theory of my own, or at least I have always felt that our present mining laws were not calculated for our forms here; that the laws were enacted for fissure veins, while our forms, both on Mount Lincoln and Bross and over on this side, were entirely different from what was intended to be covered by that law of fissure veins. Our forms here, some of them, are veins, and some of them appear to me to be deposits. Our forms on Mount Lincoln I have always thought were deposits.

Q. In what way would you think the laws were defective as to the forms in this district?—A. Admitting that these forms are veins, they are usually near the horizontal; and when a man discovers one of these veins the mining law in this county allows 300 feet by 1,500 feet, and in Park County the same; and in Summit County it only allows 150 feet by 1,500 feet. I have always had an idea that in this whole district, while we have some veins—I think in the Mosquito district over in Summit—we do not really come under the fissure-vein law; they are almost vertical, or departed so

little from the vertical as not to affect the general claims. My idea would be, that as the veins here are so nearly horizontal to make the side lines just as arbitrary as the end lines, increasing the quantity of the mining claims.

Q. How big would you make them?—A. I think the United States law makes them large enough—20 $\frac{66}{100}$ acres.

Q. That is a square location, is it?—A. Yes, sir.

Q. That is, you would make the surface and lower boundaries coincident?—A. Yes.

Q. Would you apply the same rule to the regular fissure veins?—A. I do not know any objection to it nor do I see any advantage. I do not know that the width would be any advantage, from the fact that these fissure veins seem to be almost vertical, and a surface grant is of no use. I speak of those that I have been in and know the dip of them, that is what I am judging from now.

Q. Should the extreme width of any true mineral vein have any weight in determining the width of the claim?—A. No, not if you start out upon this basis of 600 feet by 1,500 feet.

Q. For what reason would you assign these limits?—A. Just because it seems to me to be plenty, and then it is the present United States law.

Q. Don't you think that if you were a prospector who wished to locate under that law you would rather turn your claim around and have 600 feet on the ends and 1,500 feet on the dip?—A. That is very often done here.

Q. Is it lawfully done?—A. Where it is done, then the side lines are supposed to be the end lines.

Q. Is that supposed to be in accordance with the intention of the law?—A. I think it is generally. It just changes your location.

Q. Is it, then, held here that the United States law, in using the words end and side, uses them in such a way that they can be reversed at the pleasure of the locator?—A. No, sir; but I do not really know where the decision comes from, whether it is from the courts or from the Commissioner, where one has the misfortune to locate in that shape. I am not posted about it, but I think it came from some quarter.

Q. What opportunity is there under the present law to put several claims upon each other? Is there anything to hinder a man from locating a claim over the top of another one?—A. No, not under the present law.

Q. Is there anything to prevent a hundred?—A. No, sir, only the shot-guns.

Q. Is there anything in the present law which requires a man, by affidavits or otherwise, to prove that there is mineral upon the claim which he is seeking to enter under the mineral law, either placer or lode?—A. No; the section under which these locations are made takes it for granted that the discovery is made. There is nothing requiring or compelling him to do so. That is something that should be changed, something that should be required. There is another point. When deep mines are required, after discovery there should be some time established for a mine's development; he should go on with his shaft and exercise some diligence; he should not be away one or two years, and then come back and claim that shaft. I think there should be something established in regard to that by enactment.

Q. Is it the accepted belief that "jumpers," with the purpose of fraud, locate claims over and in the neighborhood of previous locations?—A. It is a fact beyond a doubt.

Q. Through this "jumping" is not a large expense entailed upon the original locators?—A. Always.

Q. How?—A. Well, they start first, they commence sinking on the claim, and you have got to get rid of them either by an injunction, or by stopping them some way through the courts; that entails an expense; then it has a very material effect upon the property. A man has a good claim, another man comes in and claims part of his lode; of course that affects his title and affects the value of the property.

Q. Don't they keep standing armies?—A. Standing armies are required to guard the property, and that of course is a great expense.

Q. What is the loss to the real owner through deprivation of the use of his property?—A. That is an additional loss. For instance, where there has been an injunction granted to parties who afterward of course were proved to be "jumpers."

Q. How long do they let them stay?—A. That depends upon the length of time before the convening of the court. If it occurs prior to the ending of the court of course it does not work near as much hardship as if it occurs between the sessions of the court.

Q. That injunction will practically stop the development of that mine until it is demonstrated that the "jumper's" claim and mine are the same thing?—A. Yes, sir.

Q. Is not the entry of a lode predicated upon the idea of the apex of the lode being embraced within the claim?—A. Certainly.

Q. Can you tell me what the apex of the lode is?—A. Here it is the highest point of the lode. We have such a heavy wash that the apex in some districts is never out of the surface. It is the point at which the lode comes nearest to the surface.

Q. It is the highest point of outcrop?—A. We have no outcrop here scarcely.

Q. Then you have no apex?—A. It is a point that has not been decided yet.

Q. Suppose a man locates a mineral claim over what seems to him to be the apex,

has it recorded, erects all his machinery, and commences to develop his mine. Another man comes along to another point a little higher than his; is it not possible for him to make a location and sweep the whole thing?—A. I do not know but what under the present land law it would be possible, but I take the ground that the first locator was the discoverer of the vein.

Q. But if he fails to discover an apex, does that help him any?—A. That is a question I am unable to decide. I claim that he has a right to go ahead. He is the original discoverer of that mine and I do not think any one should be allowed to take it from him and I do not think they could go down into him. I do not claim that he could follow the mineral up, but I think he could follow it down.

Q. Is that idea of yours based upon equity or the law?—A. Well, I suppose it was on equity. It has always been my judgment.

Q. You think that ought to be the rule?—A. Yes, sir.

(Mr. Britton here read the law on the point in question.)

Q. In the cases of litigation which you have known, have or have not the legal attacks upon original owners been made as to that part of the law which is based on the State laws?—A. In this immediate vicinity?

Q. Anywhere?—A. No, I do not know that that has been the case here. There are so many conflicts in the location and in the surveys that where there are many suits now pending and adverses been filed they lap right over each other in every possible form.

Q. So that there is a large amount of litigation which the original locator in that district is obliged to stand simply because the laws permit other claims to be surveyed over his surface?—A. Yes, sir; we have had as many as five adverses filed upon one application, and it is not uncommon at all to have two or three.

Q. What is your opinion, Mr. Burchinell, as to the propriety of abolishing these local land recorders' offices and placing the whole thing with the United States Land Office in the matter of original location?—A. I think that is one of the best ideas I have heard of in regard to revising the mining laws.

Q. Can you state any of the disadvantages of the present system in a practical way?—A. Well, that matter was pretty thoroughly canvassed by the register. The locations and survey at present are recorded in the county recorder's office of the county in which the mine may be situated. The changes that then take place in the property transfers from one party to another necessitates the preparation of an elaborate abstract of title, and that abstract rests with the county recorder, who may or may not be an honest man. His records may be at the mercy of other parties so that they can be altered at any time, while if it was put in the hands of the Commissioner of the General Land Office through his subordinates, he would always have an accurate and correct record from the location and survey up to the patent on file in the General Land Office, and that would also be on file in the local land office, one operating as a check upon the other. Then it would be a great convenience for the miners from the fact that they always have to go to the land office in recording their claims, and they would have no necessity to go to the recorders at all. Quite a number of these abstracts are made up from abstracts, often without even the seal of the county clerk.

Q. Is the county clerk a bonded officer?—A. I think so; to a small amount. I do not know that I have heard what the bonded amount is.

Q. Is there any check upon the fraudulent changing of these location notices in the county recorder's office except the honesty of the incumbent?—A. Not that I can see. The location certificate is made out by the party locating the mine. He goes to the county recorder's office and puts it on record; then it is returned to him. That is the only check.

Q. You do not get the original, but simply a copy. Now, is there any check upon their furnishing you a fraudulent copy?—A. No, sir; none that I can see.

Q. Then, aside from dishonesty in the matter of changing a certificate, is there any check upon the destruction of the certificate?—A. No, sir.

Q. Suppose, for instance, that your place of record was burned up, is there any means of reproducing the records?—A. None whatever, except from the certificates in the hands of individuals.

Q. In such a case what is there to prevent a holder of a certificate from bringing a forged one in here?—A. There is nothing to prevent that at all.

Q. Has there not been danger of something of the kind happening here?—A. Sometime during the month of July the frame building in which was the county recorder's office was set on fire. It was supposed to be set on fire by some one interested, for the purpose of destroying the records of Lake County.

Q. If those records had been totally destroyed by that fire, would it not have been possible then for dishonesty? Claimants could then produce any certificates they pleased?—A. Yes, sir. It would have caused interminable trouble.

Q. In the event of the local land office being destroyed by fire, there would be the records in Washington from which they could be reproduced?—A. Yes, sir. It is cer-

tainly a good idea, I think, to have the records in Washington and in the local land office.

Q. Would it not be preferable to have all local regulations fixed by United States statutes instead of being left to the will of the mining district or legislative enactment?—A. Yes; I think it would.

Q. Is there any good reason why mineral lands should not follow the general land policy?—A. None that I know of.

Q. In your opinion, when an adverse claim is filed against a mineral application, would it not be more expeditious, as well as less expensive to the claimants, to let it take its course in the land office, rather than to transfer it to the courts?—A. I think it would be better to let it take its course through the United States office.

Q. Well, then, generally speaking, would or would it not, in your opinion, be a preferable policy to leave the mineral lands subject to some general policy of disposition, as all other land entries; that is to say, from beginning to end within the jurisdiction of the United States office until patent shall issue?—A. Yes; I think it would be much better.

Testimony of William N. Byers, postmaster, Denver, Colo.

The questions to which the following answers are given will be found on sheet facing page 1.

POST OFFICE, DENVER, COLO., *October* 3, 1879.

Public Land Commission, Washington, D. C.:

GENTLEMEN: I had expected some questions from you orally when you were in Denver, but there was manifested no desire to learn my opinions. At this late day I am in possession, from some unknown source, of a copy of your circular of questions, which I will endeavor to answer in their order:

1. William N. Byers, Denver, Colo.; at present, postmaster.

2. Over twenty years.

3. I pre-empted 160 acres of land near Denver, making my settlement in 1860 and perfecting title in 1864. Encountered no difficulty under the pre-emption law; was interested in establishing title in two instances under Indian reserve scrip with about the usual embarrassments that attend such locations. These are the extent of my acquisitions in agricultural lands.

4. I entered the service of the government in the survey of its public lands in 1851 and followed that business energetically and almost exclusively until 1856, and occasionally since. For three years was land attorney in contested cases in the land offices of Nebraska in its early history. Have spent over twenty-eight years on the frontier upon or surrounded by government land.

5. Governed by the rules of the department. Twenty-five years ago a pre-emption title could be established, up to and including the register and receiver's certificate, in thirty days. Now six months are required. Many pre-emptors delay proving up as long as possible. Contested cases are decided quickly or protracted indefinitely, owing to the nature of the case, the interests involved, or the disposition of the contestants.

6. There have been very grave abuses of the land laws, but I think the laws themselves are good enough for the purposes intended. Nearer compliance with their provisions should be required.

7. A reply would involve a very lengthy description, which seems to me unnecessary, since the records of the Land Department and the reports of government explorers and surveyors should give all the data desired, and much more to the point than any cursory answer possibly can.

8. The paramount question is *water;* it alone determines whether land is agricultural, pastoral, or uninhabitable. Where water is sufficient to permit a fair percentage of agricultural area it should be held strictly to the provisions of the pre-emption and homestead laws. Where water is insufficient for agriculture it should be devoted to pastoral interests, and the water supply should be apportioned to the largest reasonable number of pastoral farms it can be made to supply. Hydrography has a much more important bearing upon the rule that may be established for the proper division and disposition of such lands than has geography; and it will be hard to apply an inflexible rule at all, since each arid section differs more or less in character or extent from almost every other.

9. I consider the present rectangular system the best for the survey of the public lands.

10. Two new features can be advantageously introduced for the disposal of the public domain:

First. For the arid pastoral lands of the plains above referred to, which should be disposed of in tracts of from 320 acres up to, say, 10,000 acres (approximately), care-

fully restricting the water control, at graduated prices, upon something like the requirements of the pre-emption and timber-culture acts; requiring certain improvements, continuous occupation, and, perhaps, the stocking with a certain number and grade of domestic animals, before title is perfected.

Second. For the timber lands of mountainous districts, which may or may not be mineral, in small tracts, not exceeding say 160 acres, upon conditions resembling those of pre-emption or homestead laws, giving only ownership of the timber and a surface right of possession and occupancy; reserving all minerals and the right for all persons to explore for, mine, and remove such minerals, with right of way for persons, animals, vehicles, and machinery engaged in such work. Ownership by individuals is the only thing that will preserve the mountain forests. When so owned, and not before, the present timber will be protected, economized, and preserved and its reproduction encouraged. And this is perhaps the most vital question of all in the distant future of these Western States and Territories.

AGRICULTURE.

1 and 2. Best answered by the records of the Signal Service.

3. I cannot well confine my answers to any section less than the State. Of that I should say less than one-half of one per cent.

4. My *guess* would be 10 per cent; perhaps less, possibly something more.

5. Wheat, oats, rye, barley, corn, hay, potatoes, melons, and all the vegetables adapted to this latitude.

6. One hundred inches; that is a stream filling an aperture 10 inches square under a head of say 6 inches. I give this as an average; some land requiring less and other land more.

7. The natural streams of the country.

8. The natural fertility of the soil does not seem to be materially impaired by cultivation so long as it is sufficiently irrigated.

9. From most irrigating ditches the supply of water is entirely exhausted upon the land. Some return a small proportion to the parent or some other stream. There is no regulation compelling its return, and a ditch is seldom made larger than actually necessary to supply the demand upon it. In fact the variation is in most cases widely the other way.

10. I think that east of the mountains one-half the natural water supply during the actual irrigating season is now used. Some streams are entirely exhausted, others one-half, and yet others are hardly affected. I "guess" at the general average.

11. Many neighborhood and personal conflicts, but none yet of very serious importance.

12. All of the "plains" that is not susceptible of agriculture, and most of the mountains that are not covered with timber. The pasturage of the latter is limited in season in proportion to its altitude and consequent length and severity of the winter.

13. Yes, as indicated in my answer to question 10, first series.

14. Yes, as indicated in my answer to question 10, first series.

15. Varies greatly as between localities, and is further influenced by varying seasons. Can be best answered by practical stockmen, who will incline to a very liberal allowance.

16. That depends quite as much upon the grade of the cattle as it does upon the quality and size of the family, and gives scope for the wildest kind of speculative answers.

17. The assessor's statistics will give the only basis for such calculation.

18. The general opinion is that under cattle and horses it increases; that under sheep it diminishes, or, rather, that it becomes "weedy." I do not think there is much change either way.

19. Very few have fenced; second, yes, if the fence incloses shelter, either natural or artificial.

20. Other care and treatment being the same, I do not think there would be any perceptible difference.

21. Natural streams and springs, irrigating ditches, and occasionally artificial wells, from which water is raised by means of pumps driven by wind or otherwise, or drawn in buckets.

22. Practical stockmen should answer this.

23. A disputed point, but a majority I think claim that its growth is diminished by sheep pasturage.

24. Yes, though cattle prefer the absence of sheep to their company.

25. Many; some serious, disastrous to property, and fatal to a number of sheep owners, perhaps to others.

26. Must again refer you to the assessor's statistics.

27. My opinions are fully, though briefly, set forth above.

28. In some cases it is very difficult to find the corners; much of the surveying has been badly done.

TIMBER.

1. The plains have very little timber, not one-tenth of one per cent. The mountain regions are from one-third to one-half covered, more or less densely, with pine, fir, spruce, and other timber of the same general character.

2. There is but little timber-planting as yet—that little confined to cottonwood, maple, elm, ash, walnut, and perhaps a few other varieties. If sufficiently watered it grows very rapidly.

3. Answered in my reply to question 10, first series. My reasons are a belief that it is the *only* way to preserve the forests from needless waste and destructive fires.

4. Yes, in price, according to quality and quantity of the timber; closely limiting the area, as before suggested.

5. There seems generally a natural tendency to its reproduction, and usually in the same or a slightly varying character of timber growth.

6. A majority through carelessness, a few maliciously, and occasionally by unavoidable accident. This is speaking generally, and has no references to the exceptionally numerous and extensive forest fires that have this year destroyed millions of acres of the best timber in Colorado, mainly started by Indians. I think more than half the timber in the State is now dead, killed by forest fires. As a preventive measure sell the timber, as above suggested. That will not entirely stop forest fires, but it will greatly diminish the number and limit their extent.

7. There is a good deal of waste from these causes. The saw-mill man or tie-cutter, who first enters the forest, cuts only the best. He is careless in felling his trees, and destroys many needlessly. He takes only one or two lengths from trees that would give two or three—the second or third being not quite so good, having knots, branches, or some other defect. The upper trunk and all the branches and top are left upon the ground to rot, or, more likely, to furnish food for forest fire. But the waste by choppers is a mere drop in the bucket compared to the destruction by fire. My remedy would be, sell the timber and surface-right as before suggested. Compel the mill-man or tie-cutter to purchase and pay for the land before he begins work. Then he will have an interest in working up the entire tree and in preserving the shrubs and young trees.

8. "First come, first served;" and he takes his choice, cuts, slashes, and (too often) burns at will.

9. Yes.

LODE CLAIMS.

1. Have had but little experience, and that only in developing and proving up title to lode claims.

2. Should be more definite.

3. The "overlap" principle is very wrong and mischievous. Only one party can have the *best* right, and that point should be settled before patent is made. The government should not *sell* a piece of ground twice.

4. The highest point at which it approaches or reaches the natural surface of the ground. The angle or "dip" cannot always be determined certainly from the surface indications, or the incline of the "apex," though it can be judged pretty nearly in most cases. The angle or "dip" is liable to change.

5. Generally speaking, yes, if he takes proper care in defining his location, but discoverers are usually careless, and exactness is neglected until the property becomes valuable.

6. Yes, from failure by impossibility or neglect to do so.

7. Not personally, but it is so claimed.

8. Cannot answer from my own knowledge.

9. Yes.

10. Yes.

11. No doubt such locations are often made for the sole purpose of embarrassing the actual claimants of mineral lodes.

12. It is charged, and I believe that such things are done, but I cannot from my own personal knowledge give instances.

13. Yes. It is a common saying that whenever a mine is determined to be of value it is sure to be attacked by litigation affecting the title, and very often it is founded upon the "dip" or departure of the lode beyond side lines of the surface location.

14. I think more surface should be given in order to diminish the probability of the lode passing outside of the survey lines. Then I think the spirit of the provision allowing the owner to follow his lode should be retained. But there should be careful distinction between *mineral lodes* and *mineral beds*. Locations upon the latter should be rigidly restricted to location lines, side and end.

15. Yes; in the early days of this country officers elected were generally a recorder, a judge, and a sheriff. Record books were provided, in which all mining claims had to be recorded.

16. In early days it was done by digging a hole to show work, and by planting a

stake or blazing a tree, upon which was written the name of claimant, date, and description of claim. It could be amended afterward by changing these marks, provided so doing did not interfere with other claim or claims. A record had to be made of such location. At present claim-making has to accord with United States and State laws.

18. No.

19. Yes; and should be by all means.

20. Yes, in so far as title is concerned, but there must be a ready, effective, and immediate recourse for the working of the mine and disposition of its product.

21. My ideas are given above. I consider the salient features of the mining laws to be correct; only stop the "overlap," increase the surface area where practicable, and remove the possibility of claiming a "bed" as a "lode."

22. Yes. My idea would be two or three years.

PLACER CLAIMS.

2. Only in a general way, as indicated above.

3. I think the records of the land department will answer this question best in so far as it refers to a patented title. A possessory title is instantaneous upon the planting of a stake and writing a name and date upon it, but it is liable to forfeiture if not followed up by development in accordance with United States mining laws—*i. e.*, by an expenditure in labor of $10 per year upon each 100 feet.

4. Can give nothing that would be of value.

5. In their operation very defective, or rather very greatly abused in practice.

6. "Placer locations" are made to cover various kinds of fraud; located for townsites; to cover lodes and mineral beds in place. From my observation I should judge that very little evidence of title or requirement as to improvement is necessary. Titles seem to be readily and quickly obtained, and great blocks of ground are taken up as placer claims and consolidated into tracts of (supposed) real estate with remarkable facility.

7. I have observed ground which was said to be taken and held and entered as placer claims upon which I do not believe a cubic yard of earth was ever washed, or that it was the intention of the claimants to even "prospect" it, much less work it for gold. It probably contains some gold, but not enough to pay for working, and the ground is taken up simply and solely for speculative purposes.

8. Only that it is a frequent assertion and occasional boast that lodes have been secured by placer locations.

9. There are placer lands unworked because their outlet is controlled by other than their owners, but whether such obstructive titles are based upon non-mineral locations or not I am unable to say. I think much placer ground has been taken up as agricultural land.

Yours, respectfully.

WM. N. BYERS.

Suggestions to the Public Land Commission by Francis M. Case, Denver, Colo., relative to irrigation and surveys of public lands.

DENVER, COLO., *August* 25, 1879.

DEAR SIR: I am in receipt of your circular letter inviting me to make any suggestions that occur to me pertaining to matters to be inquired into by your Commission, and have also received a copy of the report of Hon. J. W. Powell, of your Commission.

With your permission I will make some suggestions pertaining to the practicability of abolishing the present sectional system of surveys and substituting therefor a system of surveys conforming to the contour of the ground, dividing the arid public lands into farms, &c.

I had the honor to be the first surveyor-general of this district, and as such the first surveys were made under my supervision. Upon arriving here my attention was early called by the custom of the country to the fact that a different rule ought to obtain as to the surveys of irrigable lands, or rather the lands adjoining the living streams of water. The custom in "taking up claims" upon such streams was to take half a mile of water-front, running back at right angles with the general course of the stream far enough to make 160 acres. These "claims" were taken up on each side of the streams. The most practicable way I could see to secure the water-fronts to the settlers, without breaking over the established usage in the government surveys, was to have such streams declared navigable, so that the streams themselves should become boundary lines; and before commencing the surveys I laid the matter before the then Commissioner of the General Land Office, Hon. J. M. Edmunds; but it was not thought advisable to declare any of the streams of Colorado navigable.

If some such system as that suggested by Mr. Powell could have been inaugurated here then, instead of the present subdivisional plan, it might have been better adapted to the wants of the settlers; but for the unsurveyed lands in this district at this time I would not recommend any change in the system of surveys.

There is an objection to the plan of Mr. Powell of surveying these arid lands into farms or estates according to the contour of the ground, as it seems to me, and that is the difficulty in preserving the farms or estates *intact* for more than one generation, under our laws of descent and distribution. If the old law of descent to the eldest son obtained here, such a system would be more practical, as it seems to me.

The present system of surveys into sections is not perfect, but it is a better one than I could suggest, and has been established so long it were a pity to change it. The system facilitates the descriptions of real estate, and makes it possible for a man who is not a lawyer to make a conveyance of real estate, and makes it possible for a man who is not a surveyor to find the boundaries of a tract of land, if the land has been properly surveyed in the first instance.

The suggestions of Mr. Powell in reference to the necessity of co-operative labor and capital for the proper development of and successful irrigation of large tracts adjoining the large streams are good. My own suggestion in the matter would be that each State in which the arid lands occur is better qualified to make the necessary rules for developing these lands than the general government is; that these lands should be donated to the State, to be graded in price, or donated in part to aid in the construction of large ditches and reservoirs, and sold or leased in such quantities and upon such terms as shall be deemed best for the settlers and the State.

Pardon me for trespassing thus long on your time and attention, and believe me,

Very truly, your obedient servant,

FRANCIS M. CASE.

Capt. C. E. DUTTON,
Secretary United States Land Commission.

Testimony of Louis Dugal, register United States Land Office, and S. T. Thompson, receiver United States Land Office, Denver, Colo., relative to Public Land and Mineral Laws.

DENVER, COLO., *August* 28, 1879.

LOUIS DUGAL, register of land office, Denver, Colo., since 1869:

I think that the forms now in use in the district land offices, used by claimants under pre-emption, homestead, and other laws, should be reduced in number, and the entire method of entries of public lands be simplified.

The law of March 3, 1879, requiring notice to be posted and published by claimants for public lands, who desire to prove up, should be abolished. The assumed prevention of fraud by this notice does not justify the large expenses and delay frequently imposed upon the actual settler. If there is a fraud committed by the entry, let the courts take cognizance. In forms for pre-emption and homestead, proof on final payment, or proof is found on affidavit as to the non-mineral character of lands. So the present separate non-mineral affidavit is not necessary. The final proof, in all cases, should be printed in one form, on one sheet of paper. In homestead and timber culture one application only is permitted, and when the lands so entered are abandoned by reason of lack of water, aridness, or from any of numerous causes, most of them not within the control of the settler, the department holds that this is final, and he cannot file another application. This should be altered so as to permit the filing of more than one such claim by a settler after abandonment of his first. The government loses nothing by a settler filing more than one application for lands, because the land has been improved, fences put up, house and buildings perhaps, and a farm marked out. The settlers who abandon those entries in most cases move on to unoccupied lands, and thus make another farm and pioneer the country. This should also be the rule in pre-emptions. It was the rule as to declaratory statements prior to the adoption of the Revised Statutes, 1874.

In the practice of relinquishment of homestead, pre-emption, and timber culture, now the local land officers report cases for cancellation to the Commissioner of the General Land Office, and await returns therefrom. Second claims cannot be initiated on said lands, homestead or timber culture, until cancellation is authorized by General Land Office, and local land officers ordered to mark the tracts on the charts as restored. This is an evil of great consequence to many honest and deserving settlers, who, purchasing by quit-claim deed the improvements of the person abandoning or cancelling his filing, are liable to be deprived of their equity and rights by some outside non-occupying person, who, under the ruling of the department, first finding out that the local officers have received orders to cancel, goes to the land office and files a claim

(which the department sustains) to said land, and forces the actual settler in possession of the land, the purchaser of the possessory title from the cancellor or person abandoning, to leave it, causing him great pecuniary loss. This because of the ruling that title cannot initiate until the lands are ordered restored by the department and letter containing such order is received by the local officers. This information has frequently reached designing persons in Colorado from Washington before the local land officers received it, and said persons filed claims and retained said land against the equitable occupying and possessory owner. Proof of cancellation and abandonment being taken by the register and receiver, if there be any fraud it lies in the proof so taken, and the act of sending it to the department at Washington does not make it any the less a fraud; so, then, the department in approving this proof of abandonment and cancellation does it with eyes closed to the truth of the proof; and when cancelling and ordering restoration are as much in the dark as ever. The department when sending the order for cancellation to the local land office does not order who shall go upon the land, but by the rule above cited frequently permits the person least authorized to enter upon, file upon, and hold said land.

I have never known the department in all my experience to refuse to cancel an entry for abandonment recommended by the register and receiver; so the present practice of sending to Washington is solely for the purpose of keeping the duplicate township plats or records in order and to keep the lands clear of disputants. If, then, the local officers do it all but ordering restoration, why not to save time (for it requires on *ex parte* evidence in case of complaint now not less than six months to clear the land, and then the first legal applicant is entitled to it whether he have the possessory right or not, and in case of a plain relinquishment six weeks to two months are now required) let the register and receiver take the proof, alter their plats, permit the offered legal filing, and send the proof to the department, so that the records can be altered and amended, and thus save time, litigation, and in many cases grievous wrong?

Some rule of law should be made to give registers and receivers the right to subpœna witnesses in land matters and to perpetuate testimony, either by direct issue or by the right to apply for subpœna to the clerk of the United States district court; or either the register or receiver, to expedite business and owing to distance of office from United States court, should be appointed deputy clerk for this purpose. Frequently on trials in land office meritorious claimants are defeated and deprived of their rights through the fact that at present registers and receivers have no way to bring in witnesses or to perpetuate testimony.

The absurdity of compelling witnesses in pre-emption proofs to swear to what they do not know, as, for instance, "the claimant's nativity," *is apparent on reading*, and the number of forms used in this proof should be diminished by consolidating all on one sheet of paper. The present system of proof is cumbersome and costly to the claimants.

The present pre-emption regulations require that claimants shall swear that "neither am I seeking to acquire title to this tract of land with a view to sell the same on speculation." Just before he swears under the law that he has not conveyed or made bargain to convey said land to any person or persons. The above set out regulation, that he does not intend to sell said land, should be set aside, because it exacts of claimants that which the law did not intend. Who ever heard of a land owner not selling his land when an opportunity offered? And the claimant should have the law read to him, and then be asked, Have you complied with the requirements of the law? Answering yes, and swearing to the same, he should be permitted to make entry.

There should be some method adopted in the General Land Office whereby the decisions of the Commissioner, in cases coming up, may be sent out in printed form *immediately* upon being rendered to all district land officers, thus giving uniformity to rulings in all district affairs, and preventing the present mixed manner of ruling by district officers, and preventing expense to parties litigant. (See system at present in vogue in Adjutant-General's department, United States Army, of promulgating orders.)

My judgment is that the arid and pasturage lands should be segregated and donated to the States. All unoccupied or reserved surveyed lands of the United States hereafter shall be subject to homestead, pre-emption, and timber-culture claims under existing laws. When present unsurveyed lands are surveyed and brought under the land system of the United States parties occupying the same should have six months within which to come to the district land office and file. That after the expiration of said six months all lands should be subject to private entry at $1.25 per acre, in unlimited quantities. If not sold after being offered at $1.25 per acre within one year, the price of the said land shall be $1 per acre, and so on each year reducing the price until it reaches 25 cents per acre; then to 10 cents per acre, and then to 5 cents, which is one cent over the estimated cost of surveying the public lands of the United States. That all pre-emption locators shall have one year in which to make payment for their lands. Failing to do this, the land to be subject to private sale under the graduated system above proposed. In case of homestead and timber-culture settlers, they to come to the district land office each year and make proof of residence on and use of the land, as

required under the several laws, or occupancy by herds as pasturage lands. Failing in this the lands to be sold under the graduated system above proposed.

I favor square location in mineral and lode claims, with side and end lines. To save litigation I favor the abolishment of recorders under State laws in mining districts, and favor the transfer of filing claims for mines to the United States register and receiver of land districts, because the United States should hold on to all its lands until patents issue.

The township and section corners of the present system of land surveys are not permanent and cause trouble and expense to settlers to find their lands, they frequently having to hire civil engineers to find their lands.

I favor the retention of the present system of rectangular surveys, provided it is accurately carried out and the method of the survey improved. All the lands depending upon irrigation in this district are taken up.

TIMBER LANDS.

The cutting of timber on the public lands should be regulated by law. The lands should be sold at private sale or entry at $1.25 per acre, and there should be a restriction in the law opening them up to private entry that no tree under 8 inches, as an illustration, should be cut down. Self-interest in purchasers will sufficiently prevent other waste.

The destruction and waste of timber on the public lands are at present serious and wasteful, should be stopped at once, and if the present laws continue, new penalties should be enacted, and the authority under it to repress waste, &c., be given to the registers and receivers of district land offices within their respective districts. Being already officers, the new duties being in the line of their present duties will be most cheaply and efficiently administered.

As an illustration of the extent of the arid lands in this district, I take the county of Arapahoe; it is 5 by 27 townships in area, containing 135 townships, 6 miles square, and embraces 4,860 square miles, out of which say 170 square miles might be made cultivable lands by irrigation, but at present not more than 50 square miles are settled and actually cultivated; also the county of Weld, also in this district, as an illustration of aridity of the lands herein. It is 11¼ by 27 townships in area—containing 297 townships, 6 miles square—counting fractional townships. It is 10,692 square miles in area, out of which about 700 square miles might be irrigated and made cultivable, lying below Arapahoe County. If Arapahoe County takes from the Platte River water to irrigate its irrigable 140 square miles of irrigable land, Weld County would suffer for want of water (as the river runs through Arapahoe and Weld) and Weld could not irrigate to exceed 100 square miles of cultivable lands. Three-ninths of our lands are arid or pasturage lands. The water fronts of streams are all taken up in irrigable sections in this district, and the supply of water very limited.

AUGUST 28, 1879.

Samuel T. Thompson, receiver of the land office, Denver, Colo., since March, 1875, heard the above read and fully indorsed the same.

Testimony of A. M. Fahringer, stock-grower, Watkins, Colo., relative to public lands.

A. M. FAHRINGER resides at Watkins, Colo.; has been engaged in sheep raising for four years, but has recently sold out and invested in cattle. The country where he resides is all suited for pastoral purposes, and believes that a large area of nearly a million acres could be made arable by diverting the waters of the Platte in winter and spring and forming large reservoirs. He believes that the pasturage lands might properly be thrown open to private entry and that the amount to each purchaser should be limited, though he has no opinion as to the amount of acreage to which it should be limited. The homestead principle applied to large tracts he thinks would also be beneficial. Many poor men who would like to raise cattle would thus be provided for, whereas if they were required to purchase outright the expense might be beyond their means. He believes generally that the public welfare would be best promoted by some system of laws by which the government title to lands could be transferred to individuals in the largest number of holdings, but has not given the matter sufficient consideration to enable him to suggest any detailed plan for accomplishing this.

About 4 to 6 acres are required to support a head of stock in his vicinity. The growth of grass has not diminished. Many cattle men fence their ranges, but many

more do not. The land along the streams in his vicinity has been chiefly taken up. He himself has taken up three 160-acre tracts under pre-emption, homestead, and timber-culture laws. The several tracts sometimes form a continuous line, sometimes an L. Water-holes are frequently located in 40-acre tracts surrounding them. The general policy of locators is to gain control of as much water front as possible, because they gain thereby control of an indefinite extent of land around the water.

Testimony of M. H. Fitch, receiver land office, Pueblo, Colo., relative to public-land claims surveys, pastoral and timber lands.

AUGUST 29, 1879.

M. H. FITCH, receiver land office, Pueblo, Colo., receiver for three and one-half years:

I think the present system of filing or entering on lands is incumbered with too much form; many of the papers now used could be dispensed with with profit to the government and the claimants. I think that all the papers used in homestead and pre-emption entries could be condensed on one sheet of paper. The notice of intention to prove up now required to be posted and published should be abolished; it is burdensome and expensive to the claimant.

The cancellation or abandonment of homesteads either by relinquishment or abandonment on proof should be done by the local officers. They now initiate abandonment and cancellation and receive the papers, why not let the register and receiver permit at once, after relinquishment is made or abandonment is proved, the "legal settler" to file at once. Certainly the purpose of keeping a check on the district officers can be as easily done by this method, and letting the register and receiver report the abandonments and relinquishments at once to the department. Injustice is frequently done worthy settlers under the iniquities practiced under this rule—all this to be subject of course to appeal.

The present rectangular system of surveys of the public lands should be continued, provided the present method of surveys can be improved. Settlers complain of the absence of corners, and irregularities. The earlier survey stakes were made with cotton wood posts and lasted about 3 years; now they use willow or stone. Willow lasts less time than the cottonwood. Some method should be devised for metallic or other permanent posts to mark township corners, say in the center of a group of four townships. At present settlers are frequently compelled to employ at large expense surveyors to go to their claims and find their exact location; nearly always have to do this. The survey corners or mounds of stone with pits can hardly ever be found now in many townships.

Under the present system of surveying the deputy surveyors mark much land mineral on the plats which is not mineral, and no reason for it except that it lies in the mineral belt of a region. The agricultural claimants are put to great expense in showing the non-mineral character of the lands.

Registers and receivers in contests should have the right to subpœna witnesses and perpetuate testimony. There should be some method whereby registers and receivers at district offices should by circular all be notified at once of decisions in land cases of general importance. Files of these decisions being kept uniform rulings could be made and many litigations be prevented.

In 1876 this office sent up the affidavits of 27 settlers in said township showing that lands in township 29 south, 68 west, were non-mineral, and they have never been heard from since. In the mean time they have each been compelled to make proof of non-mineral character of land at a cost of say $20 each.

There are about 15,000,000 acres in this land district. Five hundred thousand acres of the lands in this district can be irrigated, provided the lands could be bought in large tracts so that aggregated capital can build canals and ditches. All the rest are arid lands, with good grass in the mountains, with occasional water-holes. It requires about 25 acres of pasturage lands in this district to feed a beef for market. I have a tract of 400 acres fenced, along the river Arkansas, and this season it would not support 16 head of cattle through the summer. The year around cattle do not do well under fence. Fourteen million acres of the lands in this district can be called arid and pasturage.

I recommend that the pasturage lands be subjected to private sale at $1.25 per acre, with a graduated price, running down each year until it reaches 5 cents per acre. Some of this land will sell for $1.25 per acre. Some will not sell at all. I believe the land should be sold so that the present occupants should be preferred, and the privilege of buying be given them in proportion to their stock. Very little timber land in this district. There have been about 20 entries under the timber-culture act. Cottonwood are planted; a good tree; grows in five years, say, 9 inches.

Timber lands are being devastated in the mountains, and should be protected, and

the register and receiver should be given authority under the law to protect the timber in their respective districts. I think the timber lands should be reserved for the use of the actual settlers in the State.

In the matter of the Los Animas grant south of the Arkansas River, the original grant from the Mexican Government was about 4,000,000 acres, and the grantees of the original grantors only had a small portion of their claims confirmed to them by the United States Government. This left the title of the balance of this grant in the United States Government. The derivative claimants got about 98,000 acres. All of it is subdivided. There are now about six or seven townships or parts of townships yet not open to settlement. These townships are now filled with settlers with permanent homes, who desire to get titles to their lands. These lands should be at once opened to these settlers.

The case of Mrs. Hicklin is in point. She had a tract of 5,000 acres of land in this grant awarded her. On account of the patent not being issued, jumpers went on the land and have made settlement. One of her sons was killed and the other badly wounded and made an invalid by one of these jumpers shooting them. This all results from non-issue of patent in her case, which makes people believe that her title is not good and they try to take possession of her lands. The money for the survey of her tract she deposited with the surveyor-general, where it now is.

It now takes, under the pre-emption and homestead laws, an average of one year to get a patent. I know of cases entered in 1872 and 1873 and 1874 where the patents are not yet issued. This should be remedied.

Fort Reynolds reservation in this district, 20 miles east of this city, has been turned over by the War Department to the Interior Department, and now awaits an appropriation for paying expenses of sale. There are about 15,000 acres of the best land in this State in this tract. It should be at once opened for settlement. Three years ago this office called attention to this.

I think that the mining recorder of mining districts should be abolished under State law and the filings of claims should be made first in the United States district land offices. Why should not the government in mineral lands as in other classes keep the titles until patents issue?

I think that coal-land tracts in this district should be reduced to half the size at present, or bring it under the mineral laws the same as lode claims, which should be square locations. There are more coal lands and better coal in this district than in all the rest of the State. There are about 25,000 acres, and 20,000 at Canyon City, and the price is too high. A settler now must take 40 acres of coal lands at $10 per acre if 15 miles from a completed railroad, and $20 if within the 15 miles of a completed road. There should be one general mining law adopted by the United States government.

About 100,000 acres of the 500,000 acres of land that I called irrigable are cultivated in part in this district, but not profitably.

Mr. Ferdinand Barndoller, register United States land office for ten years, by H. K. Pinckney, after the above statement was read to him, corroborated and indorsed, the same.

Testimony of Chas. E. Gast, Pueblo, Colo., relative to railroad grants.

PUEBLO, COLO., *October* 2, 1879.

To the Public Land Commission, Washington, D. C.:

GENTLEMEN: I think the attention of Congress should be particularly called to the present state of our laws respecting the right of way of railroads over the public land. Prior to the passage of the act of March 3, 1875 (Stats. of 1874–'75, page 482), every railroad company whose contemplated line was through public land was given the right of way by special enactment. Numerous bills of this character were passed at each session of Congress; such grants were given almost as a matter of course, and were not considered the bestowment of any especial bounty.

These especial acts were of a twofold character. In *one* class the duty is imposed upon the company of filing a plat, which shall stand as a designation of the route, and which, when traced upon the records, shall charge settlers with notice of the easement (16 Stat. 395; 17 Stat. 202, 212, 224, 340, 343, 393, 612; 18 Stat. 130, 274, 306, 309). The necessity of this in properly administering the system by which public lands are thrown open to purchasers is apparent.

In *another* class no such requirement obtains (14 Stat. 212, 237, 240, 290, 294; 16 Stat. 192; 17 Stat. 280, 339).

It must be manifest to every lawyer that it was the intention in the latter class of enactments to grant a mere *license* or *privilege* to enter upon the public lands and appropriate a specific location; and that Congress intended that an entry, coupled with possession and use, was necessary to an investiture of any beneficial interest in the particular lands over which the road may be built. The acts conferred simply a general authority to appropriate a location for corporate purposes, without which protection the acts of the grantee would be tresspasses. In advance of actual appropriation in

good faith the public lands were to remain open to purchasers, who were to take title unincumbered by any floating easement that could afterward be asserted against them by the companies.

Few will say that such was not the intention of Congress. To impute any other is to say that Congress intended to overturn the entire policy of the government in administering the land system, which has always been to dispose of its lands free from every charge except such as the records disclosed; and as the acts in question do not provide for notice of record, the conclusion is irresistible that Congress intended it should appear from actual occupation.

Such has been the ruling of the Interior Department. (See opinion of Secretary Schurz in overruling protest of Denver and Rio Grande Railway Company against the approval of plat of the Pueblo and Arkansas Valley Railroad Company, under act of March 3, 1875.)

A recent decision of the Supreme Court, at the October term, 1878, *seems* to throw doubt upon this matter. The case arose between the Denver and Rio Grande Company, claiming under the act of June 8, 1872 (17 Stat., 339), and the Cañon City and San Juan Company, claiming under the act of March 3, 1875. The route of the Denver and Rio Grande Company, as described in its articles of incorporation, extends like a spider-web along every river and through every valley and across every mountain-pass in Colorado and New Mexico. It is simply magnificent as a ramification of railroads on paper. The grant to the company gives the right of way two hundred feet in width, without providing for the filing of a plat or record notice of any kind whatever of the intended specific location. Yet the Supreme Court say, "when such location and appropriation took place the title which was previously imperfect acquired precision, and by relation took effect as of the date of the grant"; thus placing acts of the character mentioned upon the same footing in this regard as grants of alternate sections in fee, which have always provided for a withdrawal from sale within certain limits and a recognition of the rights of settlers whose claims intervened between the date of the grant and the location of the road. It is true, the opinion as a whole does not seem to comport entirely with the sentence above quoted, but it is sufficient to say that the grantees holding under such special acts have always strenuously claimed the extent of their rights to be as above stated.

If this claim is well founded, it is easy to see that it is legislative improvidence of the most extravagant kind, for it implies the fact that the possession of settlers innocently acquired must yield to the subsequent assertion of an easement of which they could have had no possible notice.

The question of a remedy, however, is a difficult one. If these grants are complete in themselves—if they confer a beneficent easement anywhere and everywhere where the grantees have corporate authority to build, and without actual appropriation—then it would seem that Congress could not derogate from them. But if Congress has conferred nothing more than a *present license* to enter upon the public lands and occupy a particular way, then, like any other proprietor, it may revoke the license so far as it has not been executed by the grantee. In the one case the grant is complete and cannot be resumed; in the other, it is revocable at any time by the will of Congress so far as the license has not been executed by actual occupation.

It is highly advisable that *all* railroad companies should be compelled to take their title under the general act of March 3, 1875. It is a very beneficial enactment, and there is no good reason why *all* companies should not observe its requirements. If there is any legislation within the power of Congress by which to resume such broad privileges as are contained in some of the special acts I have referred to it, should be had.

I think, also, that the act of March 3, 1875, should be amended as to the proviso of the fourth section, by abridging the time of *five* years to *two* years.

Very respectfully,

CHAS. E. GAST.

Testimony of Louis Goodwin, Trinidad, Colo., relative to the United States Statutes and mining matters—square location.

TRINIDAD, COLO., *September* 6, 1879.

LOUIS GOODWIN made the following statement:

I only wish to refer to one point. I think the United States Statutes ought to be revised in regard to mining matters, but I do not believe in the square location for this reason: A man may think he has a rich mine and proceed to erect expensive machinery to develop it, and just as he gets in full operation the lode may run out of his side lines, and as he cannot then, as now, follow the dips, spurs, and angles, he loses all the money he invested. I think such a law would tend to obstruct mining development, yet I think it would be well to revise the mining laws.

Testimony of William M. Hall, Trinidad, Colo., relative to cattle ranges, fencing, sale of pasturage lands, water, agricultural lands; pasturage homesteads, stock.

TRINIDAD, COLO., *August* 30, 1879.

WILLIAM M. HALL, of the firm of Hall Bros., cattle raisers and dealers, Madison, Colfax County, New Mexico, made the following statement:

Our cattle range in herds of about 1,500 head on an area about 40 by 60 miles. If we had an opportunity to purchase these pasturage lands from the government at a reasonable price we would gladly do so, as we are very much troubled by people driving their herds, both sheep and cattle, over our range. I think it would take about 30 acres of that land to raise and fatten one beef. I have talked to men who lived in Texas, where the ground produces a great deal more grass than here, and they said that there from 15 to 20 acres would keep a steer in a pasture that was fenced. I know that Texas produces one-third again as much grass as this country does. I think that here 30 acres would not be any too much. These difficulties which now arise between stockmen could be obviated if the government would allow them to buy the land, and then they could fence it. Fencing is much better than allowing the stock to roam at large. If a man could afford to pay the price the government put on the land he would then improve it, as he would feel secure in his home and could protect himself against all intruders. I think that ten cents an acre would be a sufficient amount for it, taking it in large bodies. There are many places where there is no water within 12 miles. By boring wells at a great expense they could get water there sufficient for the stock. None of this land is fit for agriculture, and would only do for stock-raising. There is no agriculture in that country. Where we have water we have tried it, and we can buy grain in Kansas cheaper than we can raise it here. There are very few cattle men in our county. There are quite a number of men from this town that have large herds of cattle over there in our range. They have come up on the ridges. All our cattle run in one body, and all the water in this section of country is needed for the stock that is there now. If there should be a general drought in that district we should all lose heavily. This would have been the case this spring if we had not had water just when we did, and we may have a drought yet. The district is overstocked. The grass will not sustain the cattle.

I believe that the government should give the refusal of the land first to the people who are living there now and have lived there. I do not believe in monopolies—one man buying the whole country—but I do think that any man ought to be allowed to buy land in proportion to the stock he owns. I would not allow a man to buy more land than he has stock to graze. There are plenty disposed to buy. The small owners would be bought out by the larger men. This land is perfectly useless for anything but stock-raising purposes. We have as good a farm at our place as anybody, but I do not think a man can make a living off of it.

I think it would be an excellent thing if a law could be passed enabling the small stockmen to take up pasturage homesteads, though in time the land would get in the possession of the big cattle men. If all alike (large and small owners) had the privilege of buying as much as they like in proportion to their herd, they would have an equal chance. Homesteading might give rise to perjury and fraud, the large owners employing men to homestead and then buying them off. I do not really believe the land would be actually fenced, but if it passed into private ownership Territorial law would protect the owner, and if it did not then he could fence. It costs $125 a mile to fence.

It is to the interest of all concerned that these questions should be settled in some definite manner, in order to avoid the trouble that will surely rise in the future, and which, under the present system, is likely to occur at any time.

I think if settling the country under the pre-emption and homestead principle as now authorized by law was tried it would drive the cattle men out of the country, and the wealth of the Territory would walk off with them. As the agriculturists depend upon the stock-raisers, it would be ruinous.

I think Colorado is little better for agricultural purposes than New Mexico.

There is one more point I should like to speak of. I give big prices for bulls, in order to improve my stock—from $60 to $400 apiece—but under the present system they range at large, and serve other stock as well as my own. If I could possess my land I could fence, and thus improve my stock. A better class of stock, and as more land would be in private ownership more taxes, would be the result of this disposal of the land.

Testimony of Edwin Harrison, president of Saint Louis Smelting and Refining Company, Leadville, Colo., relative to mineral laws.

LEADVILLE, COLO., *August* 26, 1879.

EDWIN HARRISON, at Leadville, Colo.:

Reside in Saint Louis, but since 1868 have occasionally resided and have continuously done business in various other Western States and Territories. Since above date I have had considerable practical connection with mines and mining, and am now president of the Saint Louis Smelting and Refining Company and of their several auxiliary corporations. I was on the geological survey in Missouri in 1859, and for several years was one of the board of managers.

In my opinion a mineral applicant should not be permitted to have a survey overlapping a prior mineral survey until he had first proved abandonment, or that he had a lode entirely distinct and separate from that first surveyed. Nor do I think that overlapping locations of mining claims should be permitted except upon similar proofs.

I would call the top or apex of a lode the line where the vein outcrops from the rock in place. In my view there might be several apexes, with horses between, which seems to be contemplated by that part of the statute, which provides that where two or more veins unite the elder location shall prevail. In other words, it is the intersection of the plane of a lode with the earth's surface—meaning by the earth's surface that part thereof where the rock in place is found. The top or apex, the course and angle or direction of the dip cannot always be determined in the early workings of the veins or lodes. Veins sometimes follow the stratification of stratified rocks, and sometimes cut across some, and this can only be determined by development, which will necessarily vary according to the facts of each lode. In further elucidation of my idea I consider the apex to be the outcrop of a lode, whatever its width may be, and do not confine it to the highest or upper side of the lode. In my opinion that was meant by the makers of the United States mineral laws.

In view of the fact that the terms top or apex, course and angle or direction of the dip are essential parts of the existing law, I do not think that the rights of a discoverer are sufficiently protected, and great litigation and injustice has grown out of the impossibility of seasonably determining the above points.

The outcrops of lodes are often wider than the legal width of claims, whether under federal, State, Territorial, or local regulations.

The outcrops of narrow lodes sometimes so deviate from a straight line as to pass beyond the side lines of claims.

I am not clear whether the practice of permitting lode locations upon ground in the absence of known mineral works to the advantage or disadvantage of the discoverers of true lodes. There are two sides to the question; but I am clear that no party should be permitted to locate over the dip of a previous location unless he first affirmatively proves the discovery of mineral in said subsequent location, which lode should *prima facie* be different from the first lode. I have known instances, and notably that of the iron mine in this district, where Stevens & Leiter located on the outcrop of a true vein, and subsequently several other parties located parallel claims on barren ground adjoining the side lines of Stevens & Leiter, but over the dip of their iron mine, and sinking down through such barren ground until they struck the dip of the iron mine stopped the development of that mine by injunction, clouded the title, and put the owners to tedious and expensive litigation until they could prove the identity of the lode by digging out said subsequent parties. As a rule the discoverers of rich veins or their assigns are burdened with costly litigation to defend their rights from subsequent locators, and such litigation is generally directed to that part of the dip of the lode which has passed beyond the side lines of the surface tract.

In view of the known variety and complexity of the mineral deposits in such place, it is not possible, in my opinion, to permit locators to follow the dip of their claims outside the side lines without provoking litigation, and one reason would obviously be that a connection between the workings of two claims would have to be made at a sufficient depth in order to establish the identity or non-identity of the two claims. That would consume much time, and in the interval the presumed conflict would naturally and often innocently provoke litigation and controversy.

In my opinion the initiation of a mineral claim by filing notice of location should be made with the United States land officers in some form analagous to the filing of declaratory statements under the pre-emption law, and all the jurisdiction of officers outside of the United States should be abolished. The several local districts are created without safeguards and with absolute disregard of uniformity. The officers are not necessarily responsible to any one, and there is no check upon fraud, except the personal integrity of the incumbent. The certificate of location filed with these outside and irresponsible parties is the foundation of the mineral claim, and under the present law the United States has to accept a copy of that record, with no other guarantee than the certificate of the aforesaid outside officer. If that is fraudulently changed by collusion between the locater and the mining recorder the government and

other claimants have no good means of detecting the fraud; or if the local records are destroyed, by fire or otherwise, there is no duplicate record to insure their accurate reproduction. The mining title of an entire community could easily be thrown into endless confusion and litigation by burning of these outside records in charge of irresponsible parties; and the opportunities for fraudulent changing or similar manipulation are unlimited. This very district had a narrow escape within the past six weeks from a fire in the court-house, where a portion of our mining records are stored, and which fire was supposed to be incendiary. If that had destroyed said records the titles to Leadville mines would have been thrown into endless confusion. As an illustration of the imperfect manner in which these mining records are kept by these outside and irresponsible parties I would mention one incident within my personal knowledge: Two years ago I wished to examine some of the mining records kept by the recorder of this district, as elected by a miners' meeting. I found that he had either died or left the country for parts unknown, and that his successor had never been elected, and that these local mining laws and records would be found in the hands of one William D. Breece. Said Breece had no connection with the custody of said records even under the local mining organization; and said records could apparently have been in any other party's hands as readily as in his. I could not ascertain with absolute certainty even that Breece had said records, and have not been able to see them. The point of the illustration is the loose manner in which these important records are handed about from party to party, and this aside from the opportunities for fraud if they remained in charge of the party elected by the miners' meeting.

With reference to litigation arising upon adverse claims, I am clearly of opinion from actual experience that such litigation should be confined to the United States land officers and should not be thrown, as at present, into the courts. The present practice of stopping the jurisdiction of the executive officers and throwing the parties into the courts is attended with wearisome delays and exceeding expense. The litigation would be terminated with infinitely less cost and time if the United States executive department were not required to yield its jurisdiction to the courts, both State and federal. Many bogus adverse claims would be cut off at the beginning and litigation be ended then and there. I can see no good reason in mineral conflicts prior to issue of patents in ingrafting upon the public land system a mode of determination different from that prescribed for contests under any other of the public land laws. I have had costly experience in such litigation. In one case, begun and terminated in the executive department, I was antagonized by a considerable part of a large community, and if I had been thrown into the local courts I would not only have been subjected to enormous expense and actual risk to property, but it is quite probable that no jury could have been impaneled to fairly try the case. In another case part of the conflict went to the executive department for decision and another part at the same time to the courts. The one case has been *completed* after progressing through all the forms of appeal in the executive department, while the other case has not yet even been tried in the court of first jurisdiction.

I would call attention to another defect in existing law. The statute authorizes a tunnel location to take all mines in its line for 3,000 feet and to the distance of 750 feet on each side thereof which had not been actually discovered by other parties prior to the mere record of the line of the tunnel location, and to hold all such lodes which might thereafter be cut by said tunnel by the locators doing a very small amount of work every six months, the amount of work not even being specified in the statute. It seems to me inconsistent to give such latitude to tunnel locations, while locators, by shafts from the surface, are compelled to show actual discoveries before acquisition of rights.

Furthermore, I can see no reason for confining discoveries to shafts or tunnels. In my opinion discoveries should be equally allowable from drifting. The true object of the law should be the discovery of the lode, no matter how made.

Excepting the defects generally pointed out by me, I should give a qualified approval to the present federal mining laws; but I am clearly of opinion that litigation would be practically terminated, substantial justice be done to all miners, and the actual development of mines be most satisfactorily secured if the present system of lode claims with the right to follow the dip beyond the surface ground should be abolished, and in lieu thereof the mineral lands should be sold by area in not less than 20 nor more than 40 acre tracts, and the right to ore be restricted to planes drawn vertically down through the side and end lines of the tract. I would, in other words, sell a tract of mineral land, limited by the common-law rule as in all other real-estate proprietorship. These tracts should always be rectangular, unless where rights previously vested should necessarily prevent, and should be located by the cardinal points of the compass; that there should be an established proportion between the length and breadth of those tracts; as, for instance, that they should either be a square or that the width should not be less than half of the length, the object being to prevent stringing out a claim in a long, narrow tract, and that the discovery shaft, tunnel, or drift might be upon any point in the tract claimed.

Testimony of Hon. Moses Hallett, of Denver, Colo.

To the honorable the Commissioners to revise the Land Laws of the United States:

To answer at length the questions relating to lode and placer claims on the mineral lands submitted by the commissioners would require more time than I am able to give to the subject at present.

I believe that the law concerning such claims now in force is wrong in principle and mischievous in its operation, and I beg to offer some suggestions on that general topic. If the present method of granting lodes and veins as such is to be continued, I have no suggestion to make of any material change in the law.

In all acts of Congress regulating the manner of locating, holding, and acquiring title to lode claims on the public lands it is assumed that lodes and veins are separable and distinct from others of like kind and from the general mass of the mountains in which they are found.

The unity and individuality of the thing to be acquired by the miner and conveyed by the government is taken as a fact admitted, or at least clearly ascertainable.

The first act on the subject was passed in 1866 (14 Stat., 251). It speaks of "a vein or lode of quartz or other rock in place" as the subject of the grant, and in the third section it is declared that no patent shall issue for more than one vein or lode. This language conveys the idea that a lode when found may be easily traced and distinguished from all others in the same neighborhood. So in the act of 1872 (17 Stat., 91), it is provided that the location shall be made on a vein or lode, clearly implying that such vein or lode has qualities by which it may be easily defined. This act is embodied in the Revised Statutes without material alteration, and is the law now in force on the subject.

In thus recognizing the individuality of veins and lodes Congress followed the custom of miners in this country, which is based on the same theory that a lode may be identified beyond question, having length, width, and depth which may be readily ascertained. In this there is radical error; not as to the typical vein, which is a single fissure or rift in the country rock filled with mineral matter differing from the inclosing rocks.

The walls of such a fissure may furnish unmistakable boundaries which the law may safely recognize as limiting the miner's right. Probably the mines first opened and worked were of that character, and the miners, knowing no other, readily fell into the erroneous belief that all valuable deposits may be easily traced in their course through the earth. But all fissures are not well defined, and all valuable ores are not found in fissures. While some lodes have very distinct walls, others have but one wall, and others again none at all. And among well-defined fissures, some are known to intersect each other in such way that it is difficult to determine where one begins and another ends.

And these are not the only elements of uncertainty. Associated with the ores of silver and gold there is usually a gangue or vein matter, which may be anything different from the country or mass of the mountain in which the lode is found. The difference may be very slight, as that it is softer; that it is tinctured with some metal not found in the inclosing rock, or that it is of another color, and the like. If it runs with the ore, although it may be elsewhere found without ore, it is regarded by most miners as carrying the character of a lode. So that wherever it may extend, indistinctly perhaps, and if there be a seam or crevice in the rocks to which it appears to be confined, there, with some interruption, the lode may also extend. And the courts, instructed by the miners as to what a lode may be, have sanctioned this doctrine, with such exceptions only as seemed necessary to avoid interminable confusion.

If, now, we consider what differences may arise as to what gangue or vein matter may be, and its presence in a given locality; whether it extends over a large space and embraces several bodies of ore or is confined to narrow limits; whether it is continuous for a given distance or wholly irregular and broken by intruding rocks from the country, and the like, we may have some idea of the questions contested in the courts under the present law.

In this jurisdiction cases often arise in which witnesses to the number of fifty or more are arrayed against each other in irreconcilable conflict over such questions, and juries, unable to come at the truth in a mass of conflicting evidence, often disagree or yield to the voice of caprice and prejudice.

It is safe to say that the greater part of the legal complications for which mines are notorious over all other property grows out of the practice of dealing with lodes as distinct and severable from the earth in which they may be found. In condemnation of that policy, it is only necessary to say that very many lodes have not that character, and of those that are pretty well defined it is often difficult and sometimes impossible to distinguish one from another. If we can return to the common-law principle, which gives to the owner of the surface all that may be found within his lines extended downward vertically, we shall avoid hereafter fully one-half the controversies that now embarrass the mining interests of the country.

Much more may be said of the difficulties encountered in following lodes under ground, but it is not my purpose to discuss the subject at length in this paper. It is enough to say that lodes are often so indefinite in extent and indistinct in outline that they should not, as such, be granted by name or other description. The government ought to define with certainty the thing granted, which is not done in describing it as a lode in a certain locality, with the right to follow it to any depth, although it may enter the land adjoining. But if a tract of land should be conveyed with all it contains, the utmost certainty attainable would be given to the grant, and the perplexing questions to which I have referred would be removed.

Passing from this general view of the subject, I wish to refer to a class of lodes quite numerous in some districts, which decline but slightly from the plane of the horizon. They are usually found near the surface, and, having but little inclination, they are easily accessible by means of shafts over a large area. If the ground is level, or nearly so, and the lode has a dip of 5° to 25° only, the depth will not greatly increase in the direction of the dip for a considerable distance from the point of discovery. If the surface declines or rises in the direction of the dip, that distance will be correspondingly increased or diminished. If the ground is level or it declines in the direction of the dip, there is little chance for another lode above one that is so nearly flat. If the mountain rises in the direction of the dip, there is no greater probability of finding a lode above the first until a great elevation has been reached; so that in most cases the grant of a lode so situated by its top and apex, according to the provisions of the act of 1872, is in its practical effect a grant of what lies beyond in the direction of the dip as far as the lode extends.

This control over contiguous territory is in opposition to some parts at least of the acts of 1866 and 1872, in which the surface to be taken in one location was restricted—in the first act by the local law, and in the second to 1,500 feet in length by 600 feet in width. Those acts proceed on the theory that all veins and lodes are in a somewhat vertical position, and probably Congress had no intention to enable the locator to enlarge his territory by pursuing the vein beyond the side lines. Yet the right so to follow the vein is given, and it is not limited to any class of lodes.

It has been claimed by gentlemen of ability and learning that the act of 1872 is not in fact applicable to veins which depart from a perpendicular course by more than 45°. The language of the third section of that act, "although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward," is thought to be applicable only to veins which have a perpendicular, as distinguished from a horizontal course. Moreover, if the departure exceeds 45° it is to be reckoned from a horizontal line instead of a perpendicular line. This distinction has not, however, been recognized by the courts within my knowledge, and probably it cannot be accepted.

The word "perpendicular" is correlative to "horizontal," so that every departure from one line is an approach to the other. To stop midway between the lines, and say that what has been a "departure from a perpendicular" shall become a "departure from a horizontal," would be arbitrary criticism only. There is nothing in the language to support such a distinction. But the better reason is, that the acts of Congress were clearly intended for fissure veins of which many stand above 45° from a perpendicular course.

It cannot be assumed that Congress intended to prescribe a rule for one class of fissures leaving others unprovided for. As those acts were apparently intended for all lodes, it is not for the courts to say that they shall be confined to lodes which have a certain position in the earth.

If I have sufficiently explained the operation of the acts with reference to lodes that are nearly flat, I have only to say that the policy of granting the whole of such lodes to the discoverer is everywhere condemned. The Spaniards were of that opinion and they accordingly graduated the area which could be taken in one location to the inclination of the vein.

SEC. 6. "If to one yard perpendicular the inclination be from three finger to two palms, the same hundred yards shall be allowed for the square (as in the case of the vein being perpendicular)."

SEC. 7. "If to the said perpendicular yard there be an inclination of 2 palms and 3 fingers, the square shall be of 112½ yards," following which the rule is given in like manner until the inclination becomes four palms in the yard, for which the rule is stated, as follows: "So that if to one perpendicular yard there correspond an inclination of four palms, which are equal to a yard, the miner shall be allowed two hundred yards on the square on the declivity of the vein, and so on with the rest." (Ordinances of New Spain, by Charles Thomson; London, 1825; page 73.)

The defect in this rule is that it requires the development of the vein to determine the area of the location. An American must know the boundaries of his claim at the time of making the location in order that he may be able to sell it and go in search of another. But the ordinances referred to express the popular idea that a flat vein, or one that is almost flat, shall not be given wholly to the first locator, as a coal field is not given to

him who gets a title to one of the edges of it. I use the word "give" as appropriate in this connection, because the price demanded by the government for mineral lands is nominal only. If they are of any value whatever the price paid for them is no measure of that value.

A wise policy to distribute the mineral wealth of the country through many hands and as far as possible reserve it to the laboring class of miners was sought in the legislation of Congress. In that feature to which I have asked your attention I think that those acts fail of their purpose. To correct this error, and others to which I have referred, and still others which cannot be enumerated in this paper, I would grant the lands absolutely by surface lines with all that they contain, as agricultural lands are granted, but not in such quantities as are given to agricultural claimants.

I assume that the policy of limiting the area to be given to one claimant is firmly established, and therefore nothing will be said on that head. There may be different opinions as to what the area of a claim shall be but I think that no one will be found to say that the mineral lands should be sold in unlimited extent to all persons who may apply therefor. In the law as proposed it will not be necessary to make any distinction between lode and placer claims. The miner will take all that may be found in his location without being required to consider whether it may be called by one name or another. This, with nearly all other perplexing questions, will be removed from the field of controversy.

The features of the law to which I have referred as worthy of consideration and adoption may be briefly stated as follows:

1. No location shall exceed ten acres in extent to be taken in any form, so that it shall not be less than one hundred feet in width at any point.
2. A second location shall not be made by the same person within five hundred feet of the first.
3. A location shall be good for all that may be within the lines thereof, and for nothing beyond them.
4. No location shall be made until the discovery of valuable mineral therein, but whenever a lode shall be opened and mineral found therein, whether at the outcrop or on the dip thereof, the location may be made at any point in the direction of the dip so that the first exterior line of such location shall not be more than five hundred feet from such discovery.
5. Except as provided in the act of Congress all matters relating to the manner of taking and holding claims to be left to the local legislature.
6. The proceedings for patent to be substantially the same as under the present law.

I am, very respectfully, &c.,

MOSES HALLETT.

DENVER, *November* 8, 1879.

Testimony of Cornelius Downing Hendren, cattle and sheep raiser, Walsenburg, Colo.

The questions to which the following answers are given will be found on sheet facing page 1.

WALSENBURG, COLO., *November* —, 1879.

GENTLEMEN: I have the pleasure to transmit herewith answers to a series of interrogatories, giving such information as I possess in regard thereto.

1. Name, Cornelius Downing Hendren; residence, Walsenburg, Colo; occupation, cattle and sheep raising.
2. Have lived in this county of Huerfano eleven years, and in this part of the country twenty-two years.
3. Have acquired title to public land of the United States within this State under the pre-emption laws.
4. No other.
5. No expense in obtaining my patent.
6. Defects in the practical operation of the land laws exist in numerous instances where parties make declaration that it is their intention to live upon and cultivate the tract or subdivision which they desire to enter, only for the purpose of releasing for a consideration to others of a similar character, thereby preventing actual settlement by *bona-fide* settlers. I would suggest as a remedy that where entry is made under the pre-emption and homestead laws, the party making such entry be required to establish his identity by credible witnesses, residents of the county wherein the land is to be entered, and who are freeholders in said county; and further, to execute a bond in the sum of $——, equivalent to the government price of the land to be entered, made payable to the United States upon failure to occupy and improve as prescribed by law.
7. The public lands in this county, and throughout the entire State, consist of arable,

inarable, or pastoral and mineral, and, I may add, timber lands; presenting to the view plains, valleys, ridges or divides between the streams flowing from the mountain chains, and parks or valleys occupying elevated positions.

The arable lands are insignificant in area when compared to other portions already mentioned, and are chiefly confined to those streams that are capable of furnishing sufficient water for irrigation; among which are the Platte, Arkansas, and Rio Grande. There are also numerous streams or rivulets, tributaries, which flow through small but fertile valleys. The inarable or pastoral, constituting the greater portion, consists of immense plains, elevated plateaus, foot-hills, timber lands chiefly confined to the mountains, and the parks or elevated valleys. No timber of value is found upon the larger streams; only the cottonwood, and quite limited as to quantity, yet serving the purpose of fuel.

Lastly, the mineral portion. According to recent discoveries I would not hesitate in saying that the entire mountain region in this State partakes of a mineral-bearing character. Mines producing silver are being developed within this county, a number of which are located on the Spanish peaks. I will not omit to say that coal is found in great abundance along the eastern base of the Sierra Madre and among the foot-hills.

8. Of the several classes of land already mentioned, it is my opinion that the government can best ascertain the character of such lands by general rule, except elevated plateaus and valleys, as are not susceptible of cultivation, viz, plains as pastoral; valleys, agricultural (when susceptible of cultivation); foot-hills, if such a term is proper, and the mountain regions, as coal, timber, and mineral.

9. It is my opinion that the present system of land parceling in its ordinary course, as applied to this State, has a tendency to work an injury in a majority of cases where agricultural land is the consideration, and more particularly those lands lying upon the numerous rivulets or smaller streams of the State, as per example: Many are compelled in confining themselves to subdivisions to include worthless land, for which they are compelled to pay as much per acre as that portion which can be cultivated. I would suggest that such part of a subdivision being inarable be sold at some nominal price to be fixed by appraisement, proof being established of its non-mineral character.

In regard to the surveys of mineral lands, I have not given close attention to them or the laws governing the same. It is my opinion, however, that as the mineral resources of the State are becoming developed new cases must necessarily arise, requiring the amendment or enactment of laws to meet them.

In regard to coal lands, I am of the opinion that it would be to the interest of the government, as well as to the citizens of this State, to limit the sale of coal land to five acres to any one individual. This method would prevent the monopoly of valuable coal deposits by capitalists, and be the means of cheapening fuel for the masses. This method of course would necessitate a change in the law relative to the surveys of this class of land.

Lastly, pastoral. This subject I shall treat under the head of agriculture.

10. There are two methods of disposing of such portions of the public lands in the West, designated as inarable or arid plains, to actual settlers, either by sale or lease. This latter method would prove more remunerative to the general government in deriving a constant revenue from the lease, and can be accomplished without deterioration of the land in question. In either case, no quantity less than a tract three miles square, sold or leased, would attract purchasers or renters, for the reason that such lands could only be used for pastoral purposes, and a less quantity would not justify the outlay in seeking water by artesian-well boring.

In regard to the disposal of other public lands in the West, it depends altogether upon the climate and seasons of the country, as circumstances of this nature materially alter the case. The land laws should be framed so as to meet them, and render impartial justice to all citizens of the United States seeking homes upon the public domain.

AGRICULTURAL.

1. Climate generally mild; frosts occur to 6th of June and reappear about 9th of September; snow scarcely ever exceeds 1 foot during the severest portion of the winter and soon succumbs to the warm rays of the sun, or is carried off by evaporation, caused by the prevailing winds. Supply of water for irrigation is very limited during the months of July and August each year, yet comparatively little water would be needed during summer should irrigation be carried on during winter. This applies to the smaller streams.

2. Rainfall occurs during months of May and June. The rain sometimes descends in torrents carrying destruction in its path, yet is of short duration. Rain but seldom falls when most needed for irrigation.

3. But an exceedingly small portion of this section can be cultivated without irri-

gation, such portions being confined to the base of the mountain where light showers of rain frequently fall during summer.

4. The proportion of land that can be cultivated by irrigation in this county I should estimate to be one-hundredth part, provided the water be utilized during the winter season. I could give a much nearer estimate by viewing carefully the different mountain streams throughout the county, and ascertaining by observation the area of such lands now considered as inarable, and upon which the water from the streams can be made to flow.

5. Wheat, corn, oats, barley, rye, as well as nearly all kinds of vegetables, are produced in abundance where the land is thoroughly irrigated.

6. Depends in a great measure upon the nature of the soil, the season, and position of the lands. If the soil is composed of light loam and level, or sufficiently so, to retain moisture after irrigation, a pipe four inches square will discharge a sufficient quantity to irrigate 100 acres of land, but if the land is of a clayey consistency, a larger quantity would be required.

7. The supply of water for irrigation is obtained from the streams flowing from the Sierra Madre Mountains.

8. The fertility of the soil is not diminished by irrigation, but, to the contrary, is increased by reason of a great variety of decomposed matter and substance that have a tendency to enrich the soil is being constantly conveyed through the canals used for irrigation. As an evidence of this assumption, lands that have been cultivated for a hundred years or more, in New Mexico, still produce bountiful crops without the application of manure.

9. I estimate that at least one-third of the water in irrigating ditches is exhausted by evaporation and absorption; though this amount of wastage could be materially lessened by judicious management. In this portion of the State the Mexicans are largely in the majority and are much opposed to a systematic distribution and use of water for irrigating, and have no local laws in force governing the same; but little water is returned to the streams in this locality. In the northern portion of the State, water for irrigating is used very economically and profitably.

10. It would be a difficult matter to obtain land bordering upon a stream or containing springs in this county. Nearly all water-fronts and springs are occupied under pre-emption and homestead laws, except in very elevated localities where the climate is somewhat rigorous.

11. No conflicts of a very serious nature have occurred under my observation, though many crops are lost by those living some distance from the mountains upon the smaller streams, the water being to a great extent monopolized by those living nearer headwaters. I may here state that this subject about water rights among the farmers of Colorado is one of the greatest, and one which should enlist the attention of the government. Much land can be brought under cultivation with the aid of capital.

12. About ninety-nine one-hundredths or more.

13. I do not think it practicable to establish homesteads on pasturage lands, unless springs for watering or ponds are upon the tracts, or the homestead laws be changed, allowing settlers to enter a tract not to exceed nine square miles.

14. I do not think it advisable for the government to place these lands in the market for private entry, but if the government should so elect, each purchaser should be limited to nine square miles, as before stated. The best policy for the government to pursue would be to lease the pasturage lands so as to derive a profitable revenue therefrom.

15. About 40 acres during favorable seasons. This section is equal to the best pasturage lands in the State; grass not "sodded" here as in portions of Kansas and Texas.

16. About 100 head cows.

17. About four.

18. I have observed that the grass increases in growth where pastured upon by sheep, their droppings enriching the soil.

19. But few cattle-raisers fence any part of their ranges. Cattle could be confined with perfect safety in winter by fencing the range.

20. The quality of the herds would be materially improved and better beef produced by confinement to specific ranges.

21. Springs and ponds.

22. Ten.

23. Increased.

24. Yes.

25. Texas herders and desperadoes are frequently employed to destroy sheep by a few very avaricious range-claimants, and many shepherds have been reported killed by them.

26. About 12,485 cattle, 61,000 sheep. Cattle roam at will; sheep are herded in flocks of about 1,000 to 3,000 upon restricted range limits.

27. No other suggestions to offer in regard to the disposition of the public land, but

in regard to surveys I would suggest that township section corners be designated by some very substantial material, firmly imbedded in the soil so as to prevent their easy removal by mischievous and malicious persons.

28. Not in this immediate vicinity.

TIMBER.

1. There is but a small area of valuable timber in near proximity to the mountains; among the foot-hills are found some forests of pine which can be converted into lumber of a somewhat inferior quality; spruce, fir, pine, and aspen are found in the more elevated regions among the mountains.

2. No timber planted in this section.

3. I would suggest the lease of the public timber lands by the government in limited tracts so that all settlers may avail themselves of building material under certain restrictions, viz: Lessees to give bond to preserve all young trees not exceeding ten inches in diameter at the "butt;" the object being to replace timber of mature growth utilized by the lessee. The quantity of land leased should not exceed an area of one quarter section to that of one entire section according to the density of the growth such as may be determined by an officer appointed for that purpose, whose further duty would be to appoint three disinterested persons of experience as commissioners to appraise the land to be leased; after which the amount per centum of its appraised value may be fixed by the proper constituted authority, the first year's rent to be paid in advance.

4. Yes, I deem such a course to be very necessary.

5. No second growth (in the true acceptation of that term) of any forest timber. Young trees make their appearance in isolated places; of course the aspen and cottonwood produce second growth, but such timber is not used for building purposes.

6. There are many theories as to the origin of forest fires, attributing them to spontaneous combustion of dried fungus attached to very dry trees, also the lightning; this latter cause I have no doubt is sometimes the cause, but fires more frequently occur through the carelessness of "campers" and malicious persons. I would suggest as a remedy that a heavy fine be imposed upon any person who in any manner sets fire to forests; one half of such fine to be paid to the informer.

7. No recent occurrences of depredations upon the public timber. Some waste occurs, cannot say to what extent.

8. The local custom here is to assume ownership of felled timber by the parties who fell the same.

9. Most undoubtedly so.

In conclusion will say that I regret very much in not being able to return to the honorable Commission strictly accurate answers to all the interrogatories. The reason of such inability exists in the fact that in so short a space of time it is impossible to obtain the data so as to enter more fully into the details necessary to a complete elucidation of the subject-matter here treated of. It would afford me much pleasure to render the Commission further service when necessary.

I remain, gentlemen, with the highest consideration,

C. D. HENDREN.

Testimony of Judge John J. Henry, Leadville, Colo.

LEADVILLE, COLO., *August* 25, 1879.

Judge JOHN J. HENRY, register land office Leadville, Colo., made the following statement:

Well, I do simply say that while I do not know what recommendations or alterations to make in the management of the Land Office at Washington, I will say this: that there is a great deal of delay occasioned there, and especially in the issue of patents. We send the final entry papers in agricultural and mineral cases, and sometimes it is as much as two years before we ever hear from them again—before there is any patent issued on them.

In my judgment, cancellation should be done in the local offices. My reason for this is the saving of time. Another thing I would state in this connection is in regard to "hearings." We have in this office the similar matter of lands being returned as mineral lands. The claimant comes up and claims that it is agricultural land, and says there is not any mineral on it. The laws require us to call a hearing to determine the character of the land, and we take sometimes 20 legal-cap pages of evidence as to the mineral character of this ground. Then I have to send all this testimony to Washington, where it is probably stuck in a pigeon-hole and remains six months or a year before they act upon the case. I think we ought to be allowed here in all cases when

they are of that kind, when we are satisfied that it is a non-mineral section, to permit the applicant to enter it right here himself.

In regard to abandoned homesteads, I think it would be better that the local officers should be allowed to act in the matter without sending to Washington for authority, just as I said in regard to the "hearings." I think when the land officers here are satisfied, for instance, that this land, although returned as mineral, is non-mineral—when we are satisfied it is non-mineral by the evidence and proof—then we ought to allow the applicant to make claim to it as agricultural land. I know the receiver will bear me out in it. There are some cases here where the application has been made, the man enters agricultural land or enters mineral as agricultural land, we take the proof, and send them up to Washington, and before we have heard from Washington—before they consider the case—the thirty months in which the man has to make his final entry have expired. That was the case of James M. Coles; the thirty months have expireds and we have not heard from Washington.

I have the same suggestions to make that I made in my written paper which I sent to you at Denver, and which you have not yet received; that is, that the United States deputy surveyors return too much land as mineral, giving the agricultural claimants trouble to prove it non-mineral. We have in this office 100 cases of that kind, where the applicant enters the land as agricultural and the return is mineral. We advertise for a "hearing," and in no single case has there been a claim that the land is mineral, the evidence all being one-sided. All this trouble arose because the deputy surveyor returned it as mineral and it has to be disproved, the burden of proof resting upon the agricultural claimant.

I think that the notices required to be posted up and published by the applicant for pre-emption payment or homestead final proof is, in my judgment, the greatest humbug connected with the land system. I do not see any reason at all for the announcement and notification of the land. I do not know any good it does or any use it is, and if you or anybody else can tell me, I am sure I would like to know. I do not know what the object or intention of the law was. In the first place this office is on one side of the district and the agricultural district lies away down below here, below Fairplay and South Park, and most of our agricultural claims come from that quarter. Now, if a claimant comes up here with his two witnesses, as the law requires, it will take him three or four days, and to bring the two witnesses it will cost him $100, that is if he comes on the stage, pays hotel bills, and fees the witnesses. Six months or a year later he wants to prove up on the land he has filed on; he has not seen this land, does not know anything about it; they tell him he cannot enter this land without having advertised his intention to "prove up" in the newspapers for thirty days. This costs him $5, and at the end of that time he has to bring his witnesses back here, making an additional expense. In my judgment that ought to be repealed. I think the papers of the entry system of the land office might be simplified and less papers used, though I am not prepared to state just how.

Question. What is the general character of the lands in your district?—Answer. There is very little of what you might properly call agricultural land in our district. It is only along the rivers and in the valleys that you can raise grain and vegetables.

Q. How large a part of the State does your district cover?—A. Well, I suppose about one-sixth of the whole State.

Q. And what proportion of that do you suppose to be agricultural land?—A. I should say not more than one-twentieth of it. Probably more than one-twentieth would produce hay and grass for cattle, but one-twentieth would cover all that you could raise cereals upon.

Q. How much of that land has already been taken up under the United States laws in your district?—A. In our district probably one-third of it has been entered as agricultural land.

Q. You mean that one-third of the one-twentieth has been entered as agricultural land and that two-thirds is still left?—A. Yes.

Q. How has it been with the water? Has it all been pre-empted under existing laws or local customs?—A. It is in some instances. A man cuts a ditch to carry water to his land. He has, I believe, by law exclusive right to that water. No man can interfere with it; that is, if it runs through government land.

Q. By State law?—A. No; by United States law.

Q. What law, for instance?—A. I do not know. I cannot refer you to the law, but my understanding is that the man who cuts the ditch and brings the water to his land has exclusive right to it.

Q. What proportion of the lands in this district are timber lands?—A. Well, I cannot say. I am not very well prepared to answer that question, because I have not been all over the district to see, and the timber land is not platted on our maps. The only way we have to learn is by occular proof.

Q. Are there any considerable bodies?—A. Yes; there are some considerable bodies of timber in the northern belt of the district. On the South Park Ridge there are the most extensive and heavy bodies of timber I know of.

Q. Any timber platted in that district?—A. No, sir. You can see that there has been heavy bodies of timber here also.

Q. How long since?—A. That was a year and a half ago. About a year and a half ago it was surrounded by heavy bodies of timber.

Q. What became of that timber?—A. It was cut off and sawed up into lumber with which to build the city.

Q. Part of it, you think, was used in that way?—A. Yes; part of it. I suppose that all the fuel that has been used here was also taken off.

Q. And the timber for timbering mines?—A. Yes, sir.

Q. Has that been cut off without payment to the government?—A. Yes, sir. I never heard of the government receiving one dollar for the timber cut from the land in this district.

Q. Is there any local custom regarding the cutting of timber whereby the cutting down of the tree by the party entitles him to the ownership of it?—A. There may be such a custom or rule, but I have no knowledge of it.

Q. Do you know anything about the destruction of the forest by fires, and how these fires are set?—A. No, sir. I do know that fires run over the timber land here and destroy it in a great measure, but I do not know how they are set.

Q. You have no knowledge of the comparative proportion of destruction by fire and use by man?—A. No. I do not know.

Q. Within your official observation, are not the forests being constantly destroyed without compensation or use to the government?—A. Yes, sir. They are being destroyed very fast, but, as I said before, I do not know of the government ever receiving $1 for the timber.

Q. Is that destruction of timber largely owing to the wants of the people?—A. Yes, sir; it is largely owing to the wants of the people.

Q. At the rate of destruction now going on in the vicinity of Leadville, what will be the condition of the timber a few years hence?—A. It would depend very much on the growth of the town and the demand for timber.

Q. But at the rate of destruction now going on?—A. Well, I think there would be very little good available timber here in three years' time with the present destruction of timber. I am of the opinion that it would be better for the government to offer these lands at public sale, so that they may be subject to private cash entry, because then the applicants, usually mill men, builders, &c., would buy them. They are willing to buy them and pay for them. But they cannot do it now without going through the pre-emption and homestead entry. They are bound to have the timber, and are willing to pay for it; but if they cannot buy it, they will steal it.

Q. Ought there not be some regulation for the preservation of timber?—A. I think it would be largely to the interest of the United States if the person who purchases the timber was not allowed to cut it all off at once. It would be very good to preserve the timber. It has been shown by many writers that timber is necessary in all countries for the production of rain and other reasons. I think it would be well to reserve some of these lands for the growth of timber. There are some sterile lands here which I think, if the timber was cut off, would never grow up again. I think there would be no young timber to take the place of the original growth.

Q. Speaking of throwing these timber lands open to private entry, would you impose any limitation upon the entry?—A. I would be in favor, as it were, of letting down the bars and permitting every man to come in and buy government land and pay for it just as much as he wants. I would not suggest such a thing in a newly settled district, but in an old settled district, where the best and most desirable lands have been taken up. When there is no chance for speculators to speculate on it, I would say throw it open to every person.

Q. Don't a man have to commit perjury to get timber land now?—A. No, he does not. To acquire a portion of timber land he can use his pre-emption or homestead right, but after these have been used he cannot acquire more without perjuring himself.

Q. Did you ever know of an instance of a patent being issued to a pre-emption claimant where the man had simply built a hut and had not cultivated anything?—A. I have known orders issued upon agricultural claims where there was no real agriculture, in fact no plowing done.

Q. Was it not sworn to in the papers?—A. No, I think not. I think the question is asked him "How much of this land have you plowed or cultivated?" and if he says none, as they very often do, I do not think a patent would be refused him on that ground. The idea is, as I understand it, that if he takes it up for a home, settles on it, builds a house on it and lives there, that he has met the requirements of the pre-emption and homestead law. We often grant a patent if the applicant has not cultivated the soil, because the season is too short or the altitude too high. It would be absurd to compel a man to plow when he could not raise anything.

Q. So that any person will and can take up first a pre-emption, then a homestead, making 320 acres of timber land, by simply erecting his house there and swearing

that he intends to make that his home?—A. Yes, sir; if he has made it his home, as soon as he made his filing.

Q. For how long a time? A. From the day of filing; from the day he "proves up".

Q. How long after that?—A. They generally allow him to make entry three months after filing.

Q. That would make 320 acres of timber land that a person could acquire rightfully in that form; then cannot he locate a timber-culture entry upon it?—A. Well, I do not know really what the timber-culture law is. We have never had an instance of it in this office. I do not feel prepared to say. I am not posted upon the timber-culture law, because we made no use of it in this district since I have been here.

Q. Cannot a man purchase soldiers' scrip and locate additional land with that?—A. Yes, sir.

Q. What were you going to say about the South Park question?—A. That the South Park was a question of altitude.

Q. What is the altitude?—A. The altitude is 9,000 or 10,000 feet. And while it is returned as agricultural land, and in reality is agricultural land, there is not a bit of it that is cultivated. A man may have a garden behind his house, with a little patch of potatoes, but that is all.

Q. Is there no coal in the South Park?—A. Yes, sir; there is said to be one large body of coal about 10 or 12 miles from Fairplay, near Hamilton or Como.

Q. Has there been an entry made of it as coal land?—A. Yes, sir; it has been entered by the South Park Coal Company as coal land. In the last year we have had several coal filings, but only one coal entry. I have never known persons to be benefited by an entry of others. But then I cannot say positively. A man comes up and swears, and his two witnesses swear with him, that he has been on the land. I cannot question it.

Q. How much additional soldiers' homestead scrip has been located in this district?—A. Not more than one piece.

Q. What character of land?—A. Agricultural land, so called.

Q. What was it as a matter of fact?—A. It was grazing land.

Q. As affecting the public interests, have you any idea upon the use of this scrip for the purchase of public land?—A. Yes; I should abolish all kinds of scrip.

Q. Why?—A. Because of the trouble and difficulty there is in locating land with scrip. Now, these soldiers' warrants, and all kinds of scrip, a great deal of it, is counterfeit and a great deal of the transfers are forgeries, and no man is really safe in using the scrip until it is approved by the authorities in Washington.

Q. Do they ever undertake to use it till it is approved in Washington?—A. Yes.

Q. Soldiers' scrip?—A. The Supreme Court scrip has not all been approved by the Commissioner. Some of it has.

Q. It ought to be issued by him, ought it not?—A. I do not know how it is issued, or what it was issued for. The most we have handled has Caleb Cushing's name on it, showing that it was signed by him.

Q. How much of your district could be classed as pastoral land, and what would be your description of pastoral lands?—A. I have made no calculation, but should say that one-half of the land of the district is pastoral land. From this land grass and hay can be taken.

Q. And is not capable of producing cereals?—A. Yes, sir.

Q. For what purpose are these pastoral lands adapted, meaning by pastoral lands lands not capable of raising cereals?—A. For the purpose of raising cattle, feeding stock, cutting grass for hay. There is, however, a great deal that cannot be used for any purpose, being barren, hillsides, &c.

Q. Then these desirable pastoral lands, are the present agricultural land laws adapted to their sale or disposition?—A. My answer is *no*.

Q. Why not?—A. Because the purchaser cannot obtain enough of them, and he must have a large amount to make the holding of them profitable for grazing.

Q. In your judgment how much of this land in your district would be required for the raising of one head of beef for market?—A. I should say, on a rough estimate, 5 acres.

[NOTE.—The average altitude of this district is 8,000 feet.]

Q. Taking your district as a whole, the barren land, the hillside, &c., what would be your estimate of the number of acres for the raising of one head of beef?—A. Well, I should change my estimate, and say it would take at least 8 acres to feed a bullock, because there are a great many side hills that do not produce anything.

Q. Now, don't the lands at an average altitude in your district produce much better grass for grazing purposes than the lands down in the lower altitudes?—A. Yes, sir; I think it does.

Q. Your idea of disposing of this land would be what—this pasture land?—A. My idea would be to render them subject to private entry.

Q. Without limitation?—A. Well, yes; I should say without limitation.

Q. Suppose, then, one man walked in and bought it all?—A. Well, it would be all the better for the country if he would.

Q. Why?—A. Well, for one reason, as soon as he purchased it it would become taxable and bring a revenue to the State.

Q. Would you make the revenue so much per head for the beef?—A. Put it on the land, the stock, the improvements—everything that was put on the land. It would be a revenue to the State, it would render the land productive, and it would cause settlements to be made all over it, whereas now it pays no tax.

Q. If one man bought it all, how many settlements would there be?—A. He would sell it or lease it from time to time. Well, probably it is saying too much to allow a man to buy unlimitedly. You might limit him to 2,000 or 3,000 acres. I do not think any man wants a less amount for feeding cattle.

Q. Excluding all agricultural land—that is, land which can raise cereals—excluding the timber lands and mineral lands, and taking the plains, what do you think it could be sold for per acre in this district?—A. I believe it could be sold for $1 per acre; that is, at an average of $1 per acre.

Q. That is the pastoral lands?—A. Yes, the pastoral lands; they would sell for an average of $1 per acre.

Q. What proportion of unsurveyed land have you in this district?—A. I should think one-half of the land in this district is unsurveyed.

Q. Has there been any trouble about the monuments and corners or anything of that kind? Are the monuments found readily?—A. Well, I cannot very well explain that, because I have confined myself since I have been in this office almost exclusively to the office. I have traveled over the district very little except by public conveyance. I have not walked over the public land since I have been here. I have never seen a monument or corner post marking a section or township. I have people come into the office here and complain that they could not find the corners. The posts have been knocked down, dug up, or moved, and they did not know where the corners were. That is a very general complaint.

Q. Do they rot down?—A. I suppose the wooden stakes would rot down in time. I do not know just how long, but probably it would take a stake five years to rot off.

Q. Is there much mineral land in your district?—A. Yes, sir; a great deal.

Q. Are the present mineral laws, in your opinion, applicable to the disposal of those lands?—A. Yes, they are applicable to their disposal; but I think there is a great deal more formality required by law than is necessary—more red tape.

Q. That is the administration of the law you refer to?—A. Yes, sir.

Q. I am speaking of the law itself.—A. Those who administer the law administer it as it is and require nothing more than the law requires.

Q. Well, in your opinion, is the present law adapted to the perfecting of mineral titles without inducing conflicts?—A. No, I think it is not.

Q. Why not?—A. I can give you my views, gentlemen, but I would rather you reserved this question to be put to the receiver, as he is better posted than I am.

Q. What changes can you suggest in the present mineral laws of the United States?—A. The law requires, for instance, that a shaft shall be sunk in the middle of the claim, in the center, and that there shall be no more than 150 feet on each side of the shaft. I do not see any good reason for that. If that man owns that claim, I think he ought to be allowed to sink his shaft on any part of that claim he thinks proper. Then, further, the law requires that the applicant or claimant himself shall make certain proofs. Well, now, when he comes to make his entry, to make these proofs, the applicant is in New York, Saint Louis, Washington, or some other place. So I think it would be just as well that disinterested witnesses should make the proof as the applicant, and I think it would be a great deal more feasible and proper to have all the business in regard to the public lands done in the local land office by the United States officers, and that the registration of claims in the first instance should be done by the district land office in that district. All records of location and discoveries of mines or placer ground should be recorded in the records of the office of the county recorder. Now when a man draws up a title he comes to the county recorder's office and has recorded the location and entry. Sometimes that office is as far away as the United States land office; but if the law was amended, for long distances or rich mining camps a deputy register could be appointed, who could go long distances.

I would like to make another suggestion in regard to taking proof. Where there are three or four or half a dozen witnesses I think it would be well if either the register or receiver could go out of his office and take the proof, which is not allowed now. For instance, we have a great deal of business from our old county from which we moved the office. To make homestead or pre-emption proof it is necessary that three persons come to this office. Sometimes one of these persons or the applicant himself may be a cripple, or sick and unable to travel. I think it would be well to allow the register or receiver to go over to Fairplay and take this testimony of these parties. It would save them a great deal of expense, and he could go there, charging them a very trifling amount for the expense of going there and coming back; while

they have to bring three parties over here and take them back, pay witnesses' fees, hotel expenses, &c.

Q. You think the present system of taking proof works hard for the person making the proof?—A. Yes, sir, in a great many instances. Well, I do say that I deem it advisable to have all these records of discoveries made in the land office instead of in the county recorder's office, because there is no check upon the recorder's office; dates may be altered or papers destroyed. There is no supervision over the recorder's office, and there is over the land office, as duplicates of all proceedings of the land office are made in Washington, so that it would be impossible to destroy the records or alter them.

Q. How long have you been here in Leadville?—A. We came here the 10th July.

Q. About six weeks ago?—A. Yes, sir.

Q. Has there been any attempt to set fire to the court-house?—A. I do not know whether there has been any attempt to set fire to it, but I know it has been on fire, and was materially damaged.

Q. Suppose that the contents had been entirely destroyed in that fire, what evidence would remain of the original location of mining claims in this district?—A. Nothing but the certificate of location in the possession of the locator.

Q. There would be no official record left anywhere?—A. No, sir; certainly not.

Q. The only evidence of original location then left would have been the certificate given to the miner or mine locator, and which would have been in the possession of the party himself?—A. Yes, sir.

Q. So there would be no check upon the parties altering that certificate except the honesty of the party?—A. None that I know of.

Q. I know that under the statutes of all the Western States and Territories, except Colorado, which I do not know so much about, a man on unsurveyed government land shall be protected on his 160 acres, and if any person trespasses he recovers damages under the laws of that State, and the courts recognize his absolute right and title to the 160 acres of land. Is that so in Colorado?—A. That is the case.

Q. Has not that a tendency to prevent the people from acquiring title under the United States laws? Do you know of such a case where he is protected by the State so that he does not want to get a title from the United States?—A. It has not, because the United States laws require the settler to make his filing in the United States land office within three months after the plot of official survey is filed therein; otherwise the settler before survey is liable to have his land filed on by other claimants and he thus lose all the right which prior possession gives.

Q. In case an adverse claim is filed against a mineral application, should the litigation thereon continue in the United States land office, or should the jurisdiction of the United States office be restricted and the litigation be transferred to the State courts?—A. I think the litigation should be continued in the United States land office; it would be both simpler and cheaper, and, as I said before, the land offices know more about it than any other office in which the case has never been before.

Q. How about the delay?—A. There would be a great deal less delay if it was settled in the local land office.

Q. And the expense?—A. It would be a great saving of expense.

Q. If the United States maintained exclusive jurisdiction generally in the issuing of patents, would not the tendency be to foster litigation?—A. I think so.

Testimony of S. W. Hill, mining engineer, Leadville, Colo., relative to mineral laws.

PUBLIC LAND COMMISSION,
Leadville, Colo., August 27, 1879.

S. W. HILL:

Reside at Houghton, Michigan. Have had more than thirty years' experience as a mining engineer in the Lake Superior region; to be more particular, I was with Dr. Houghton in 1844-'45, and in the United States surveys of Foster & Whitney, as well as in that of Jackson. I have been a practical miner—a director, that is, of mining enterprises—and have built up a number of mines in the Lake Superior region.

There are no defects in the operation and administration of the United States laws which would attach to our district, the Lake Superior region, but the land there is not under the same conditions as this here in Colorado; the old system of public land surveys covered our Michigan country. The government sold that land after the geological survey of Foster & Whitney by the legal subdivisions of the public surveys. There has been no litigation except in two instances. One of these was a case of unintentional trespass; it was simply a case where the tracts of land claimed by two parties overlapped; in consequence of this overlapping a few fathoms of earth were

excavated by one of the two parties in what was determined to be the other's tract I was then directing mining operations in the neighborhood and was called in as an expert to determine the damage sustained. Taking another engineer with me, we made the examination together and decided what amount of mineral had been taken out. Upon our report a check was immediately drawn at the office of the trespassing party for the full amount of loss sustained, and the other party was duly indemnified.

In the other instance mentioned I was called in as a witness. I testified in regard to the position of four posts serving as monuments of the corners of a certain tract. Three of the posts were wooden, and sunk in the earth; the fourth of iron, set in a hole drilled in rock. By the public surveys it was determined that a post on one corner of this tract stood out of line. An expert in the employ of the party owning this tract had determined that an adjoining party was trespassing within the true lines of the tract in question. A suit was thereupon commenced to recover damages. I was summoned, and came from the other shore of Lake Superior to give my testimony. I took the judge and jury and showed them the actual position of the corner posts. A verdict was at once given in favor of the plaintiff. The trespass was paid for, and the litigation was thus ended.

In the interpretation and administration of the present United States laws as to lode claims I may say, in general, that I think little difficulty would arise so long as the lodes were nearly perpendicular in position; but when the deposits are nearly horizontal and in the nature of a stratum or floor, as here in Leadville, the application of laws framed to cover clearly defined vein claims will produce injustice in certain cases.

I can say unreservedly in regard to the present official practice of filing surveys of lode claims which overlap on the surface that I do not approve of it. I believe that it certainly works injustice. If it were possible to establish positively and with little trouble or expense the true position of a lode, and to distinguish it from other lodes, this overlapping of claims might not be so objectionable; but under existing conditions I certainly do disapprove of it.

The top or apex of a lode is the highest point of its outcrop in rock in place. It is often the case that a man does not own the true or proper apex of his lode when he makes his location and sinks his shaft. After his work is far advanced he may discover to his cost that the lode which he thought to be his is really the property of some other man who has located above his claim. In the early workings of veins or lodes it is certain, therefore, that the apex and the course cannot always be determined.

The intended rights of a discoverer are assuredly not defined or properly protected by the locating of a claim under the existing laws. In my opinion the laws as they stood in 1865 and 1866 were much better than they are at present.

Litigation and injustice have often grown out of the impossibility of determining with certainty the top or apex, the course, and the angle of the dip, within my own experience and knowledge. I have frequently been called upon to be present as a witness in the trial of cases involving this very condition of things. By the wording of the laws a man is dragged into a lawsuit, and fails to obtain protection under the same laws for his just rights when his case is adjudicated in court.

I have not known of a contest arising from two parties locating different seams from the same outcrop; but it might very possibly occur for all that; for my experience in this region can scarcely be termed a varied one. I have been looking up quartzite within the past few weeks, and have often found it ranging over 300 feet in width. It was impossible to tell whereabouts within these deposits the gold or silver-bearing quartz might lie. Two discoverers might both locate with perfect honesty of intention on one side of the ledge or rock in place. The result of such locations would almost certainly be litigation; for a claim with a width of 300 feet would not cover the outcrop.

It is sometimes the case that outcrops of narrow lodes so deviate from a straight line as to pass beyond the side lines of claims. The lodes are often extremely crooked. Fissure veins rarely run in a straight line. Thus the general course of a lode will vary often within every few hundred feet. Every prospector should study vein phenomena and make his locations with care and judgment. There is no reason why a man should have any right to a lode after it passes beyond the side lines of his claim. The harm in granting the right to a man to follow the course of his lode beyond the side lines of his claim is that it at once causes litigation. Two cases of litigation, on this account, are now in progress here in Leadville. In one instance the original discoverer made his location on the idea that he had found the highest outcrop and determined the course of his vein. It turns out that his lode runs outside of his side line and into the ground of the other party to the suit, who traces the vein down from an outcropping apex above the side line of the first locator. In the other case the outcrop comes out below the side line of the first locator, whose ownership of the lode is accordingly brought in question. These continual disputes interrupt the legitimate business of mining.

The deposits here in Leadville are not fissure veins, but what I call contact veins

These veins partake of the character of true veins and of simple horizontal strata or deposits. It is evident that they are not to be classed with placer deposits but with vein deposits, although differing materially from true fissure veins.

The practice under the law of permitting lode locations of alleged lodes on non-mineral ground works to the disadvantage of the discoveries of true lodes. Consider, for instance, a case in which a man has discovered a true lode. Straightway another man sinks a shaft on adjoining property and claims to have discovered mineral in ground lying above the first man's claim. In almost all cases following the direct and legitimate application of the mining laws, the first man is the true discoverer and the second is a jumper. Yet in the case of the iron mine, Judge Miller's charge to the jury certainly conveyed the impression that it was not the business of the United States Land Department to ascertain whether the second locator had mineral on his claim or not. Simply paying $5 an acre entitles a locator to obtain a claim, under this ruling, and it is manifest that this practice must work injury to the man who is pursuing a legitimate business of prospecting for true lodes. I have had considerable acquaintance and intercourse with mining men in all sections of the country, and have found those men, who are engaged in the legitimate business of prospecting and exploring, to be, as a rule, useful and honest citizens. They may sometimes fall by chance into the hands of bad, designing men, and may lend themselves to evil and illegitimate purposes, but, unless misguided, they are disposed to act fairly.

In the case supposed, where B, a subsequent locator, makes a location outside the side lines of the first locator, A's tract, parallel to it and over the dip of A's lode but upon barren ground, it would almost certainly follow that A will be put to the cost and inconvenience of an expensive litigation. Such a case is occurring weekly in this locality (Leadville). The allowance of such a location as B makes permits a man to put another to great inconvenience and may even constrain the first locator to postpone the development of his claim. In traveling over this region the question occurs to me, in what way we can best shape and perfect the laws so that capital may be stimulated to lend itself to the development of our mineral resources, and may be protected in its investment and at the same time the rights of the miner may be secured. This question is the main one, the general one, with which we have to deal and upon its satisfactory solution depends the future prosperity of our mineral interests.

As the case stands at present, a large majority of the discoverers of rich veins or their assigns are often burdened with costly litigation to defend their rights from subsequent locators in their immediate neighborhood. In this way the investment of capital is directly discouraged and the interests of an industrious and fortunate miner are put in peril. The legal attack in such cases is commonly directed to the portion of the dip of the lode which has passed beyond the exterior lines of the surface tract.

It might be possible to retain in the United States mineral laws a provision by which locators can follow the dip of their claims outside their side lines, and yet avoid litigation, if the general course of veins were perpendicular or nearly so. But as the law must be framed to cover horizontal lodes as well as lodes that dip at a slight angle, in my opinion such a provision cannot be retained with good results.

I think that all mining district laws, customs, and records can advantageously be abolished as to future locations, and that the initiation of record title should be placed exclusively with the United States land officers. I know that many associations of miners pass resolutions and make regulations of whose purport they are ignorant, and which often are detrimental to their true interests. In many cases, too, these regulations are at variance with the decisions of the courts and the rulings of the General Land Office. Even if these district laws did not conflict with the decisions of the courts, I can see no propriety in retaining them. The officers detailed to conduct this business for the United States will receive their instructions from the Land Office and will be guided by its rulings. The abolition of these local regulations would simplify the interpretation of the law, and would do away with these objectionable miners' meetings. In some of our Western States and Territories there are instances where a majority of the members of the legislature have passed statutes which were found to conflict with the laws of the United States. When inexperienced legislators meet, whether in a regular State assembly or in a rude mining camp, they are almost certain to commit mistakes from local prejudices and ignorance of the federal laws and the rulings of the courts.

Believing that the practice of following the dip beyond the side line of a claim is incompatible with satisfactory administration, I can only say that no method of location seems satisfactory to me except that of confining all mineral-land grants within certain lines, which should cut off all deposits perpendicularly, and allow to a locator only the land immediately under his surface tract within the boundary lines and all deposits therein. I have had thirty years' experience with the operation of the mining laws of this country, and can honestly say that I believe the business of mining would have been practically abandoned, in view of the continual annoyances and litigations growing out of legal complications, had not the magnitude of the great silver deposits induced men to endure the incident legal squabbles and other inconveniences. If no

changes are made by the time we arrive at the point when ores of low grades must be handled, the country will be ruined. I can conceive of no remedy for this impending condition of things except a radical change. In some districts in certain States it is true, no doubt, that this change is not needed, but it is evident that the change can work to the disadvantage of no one in any portion of the country.

In regard to the proposed requirement that a man should prove the discovery of metal before he can acquire title to a claim from the government, I would emphasize the point that under the present law a man can come forward and take up a certain number of acres of ground without ever having put a spade in the earth. I think, decidedly, that it is best to require that a deposit of mineral should be discovered before the land should be sold. It was supposed that this requirement was necessary before the ruling of Judge Miller in his charge to the jury in the iron-mine case recently published. He ruled that it was not necessary, under the present statutes, for a man to prove to the Land Department that he had struck mineral. He was only required to prove that he had expended $500 in improvements in order to purchase the lands from the Land Department at the legal price of $5 per acre.

It seems to me that the true course for the government to follow is to dispose of the lands to locators by requiring them to take out a patent within a reasonable time. Under the present law a locator may take all the valuable mineral from a claim, and still pay nothing to the government for the land. I find here in Leadville, for instance, applications for only about 300 patents. Now, I have traveled about this neighborhood quite extensively, and should judge that there are certainly 3,000 claims located about here. Now, a large amount of mineral is taken out by these locators daily and sent to the smelting-houses for which the government, which really owns the land, gets absolutely no return. When the claim is exhausted of mineral, the land is practically worthless; the locator throws up his claim, and the land reverts to the possession of the government after it has been made unsalable.

There certainly should be some limit as to a possessory title, and my own view would be to give only a short time to locators during which they might acquire a title by purchase of a patent from the government. I am disposed to make any reasonable allowance to an honest locator, and to aid him in every feasible way, if he is poor and needs help. I have a sincere sympathy with the men who are exploring and opening up a new country. I feel disposed to be exceedingly liberal toward them. They are obliged to pay the expense of surveying their claims and have other considerable expenses incident to developing them. Still they should be obliged to acquire their titles within a reasonable time, which, in my opinion, should not be longer than eighteen months, if indeed a year would not be an ample allowance. The government has limited the possessory title to placer claims to the period of one year, and it seems to me that the law for one variety of claims might be extended to cover the other with perfect propriety. What we want is simply a sufficient time given to the miner whose intentions are honest in which to perfect his title.

I have been from one end of the State to the other during the past year, and have noticed how the claims are worked, and the question occurs to me, how much money is the government going to get from its mineral lands? The mineral is fast going away, and the jumper is going away also. What will the government get? Nothing, absolutely nothing.

It is necessary for us here in Leadville to levy taxes in order to carry on our local governmnent or to pay our proportion toward the support of the State government. Now, if the national government by its present course in relation to the allowance of possessory titles deprives us of the opportunity of levying taxes on property, it deprives us of our proper resources for carrying on our local and State government. As long as our locators are allowed to hold their possessory titles without purchase, they are non-property owners and cannot be taxed for their claims. When they acquire title by purchase, they must contribute their quota for the support of the municipal and State governments.

By our present laws we are encouraging the production of a race of perjurers and plunderers. This condition of things cannot long exist in this country or anywhere. The remedy for this state of things I should say briefly to be, first, that the surface boundary lines of a claim should limit also all deposits within that claim; and secondly, that all claims should be paid for within a reasonable time.

When the act of 1872 was passed by Congress our land system in Michigan was practically perfected and closed up. It was at once perceived that this new law was applicable to discoveries of mineral in Michigan as well as in the neighboring States. In December, during the holidays, I went on to Washington and presented the subject to the attention of the members of both Houses. I showed them that the bulk of our lands were already disposed of under the old system, and that the introduction of the new one would only cause unnecessary complications. We had a bill introduced in both Houses excepting Michigan, Wisconsin, and Minnesota from the operation of the new law, the act of 1872, and leaving the law precisely as it was before the passage of that act. There was not a Western man in either House who objected

to our bill. Stewart, of Nevada, to whom I presented the case, saw the point at once and made me sit down and draft the bill. I presented the bill as drawn to Sargent, and he indorsed it immediately. I went to our own Senators and they were thunderstruck that a bill of such a character as the act of 1872 should have passed without their understanding its true purport and effect. I went also to the Committee on Mines and Mining and explained the matter to them. They said that the wording of the act was evidently not right, and that there was undoubtedly much imperfection in the law as it stood. They thought that my supplementary bill had better be passed, and then the whole question considered at a later time. I had previously been to Drummond, Commissioner of the Land Office, and he had written to two members of this committee, suggesting that our bill should be passed. The fact was that nearly all our lands had been disposed of under the old system, and the introduction of the new one would be a serious inconvenience.

In regard to the new mineral law proposed, I would suggest that one law should be drafted to cover all varieties of mining claims. I have given this subject a little attention, and it seems to me that the more thoroughly we can simplify the terms of this law, bringing it within the comprehension of every miner, whether engaged in lode or placer mining, the better it will be understood and the better obeyed.

As regards the investment of capital, I may say that the reason why I do not invest is because of the uncertainty occasioned by the law as it stands at present. In my own interest I am paying some attention to the mineral developments of this region, and throughout the country I am in correspondence with men who have surplus capital to invest. The money that was invested in the Lake Superior region was the surplus capital of New York, Boston, Philadelphia, and Pittsburgh. A large amount of this capital has been invested by my advice and under my direction. We take steps, for instance, to develop a mining industry. How do we organize? One man looks over the matter carefully and says: "I can spare $10,000 to put in as capital." Another man contributes $10,000 more, and so on, until the full amount of capital required is supplied. These same men who had money to spare to develop the resources of the Lake Superior region have money to spare now to develop the resources of Colorado. Is it safe for them to invest in mines here under the present laws? I have considered the matter carefully, and have advised these men not to put their money into mining operations in Leadville.

The privilege of purchasing land in whatever quantities are needed or desired does not tend to concentrate the landed property of this country in the hands of monopolists. Suppose, for instance, we undertake to sink and explore a mine. In the first place we obtain 640 acres of section land. Add to this a few acres besides, which we buy. This land is useful only for mining purposes. For agricultural uses it is worthless. Our vein, say, is only 9 or 10 feet in width running through this property. We are obliged to use a great deal of timber. Take the Quincy mine, for example. We have used the timber cut from about half a section of land for our purposes in the mine. We now have about 10,000 acres of land belonging to the Quincy Mining Company. The company will gladly sell that land for less money than the taxes levied on it. It would ask security for the taxes only from any one who might wish to lease any part of this tract. Now, we must have police protection in the county, and police protection can only be had by paying for the support of an adequate police force through the taxes. Do you know that no mining company has neglected to pay taxes on all its land? Thus we have resources to carry on our local government. Yet there is an immense amount of land held by private parties which is offered for sale constantly owing to non-payment of taxes.

If the tracts of land which could be obtained by a private party or a company had been limited to 20 acres we should not have developed the mines in the Lake Superior region as we have actually done. I am not prepared to fix the limit to the size of the lots which should be allowed to any one man. I think, however, that the size of the lots should not be very large, but that a man should be allowed to take several lots if he has occasion for so much land.

We entered up our agricultural land in Michigan in quarter sections. There was no restriction on the number of entries which a man could make. He might have made a dozen entries if he had so chosen. By the State laws we prohibited the purchase by one man of large tracts of land from the United States. Our first sales were made at $5 an acre, and the prices obtained for land in later sales ranged between $5 and $2.50. Two and one-half dollars per acre was the limit, and finally all purchasers bought their lots at this price. When the mining laws in our State were first drawn and passed the limit of mineral land which a man could buy by a single entry was fixed at 2,500 acres. Later it was found that this tract was not sufficiently large, and we then passed a law allowing corporations to purchase 5,000 acres. Whatever additional amount was needed a corporation could privately buy without any trouble.

Then our iron industry came into prominence. There was a demand for a larger area by the corporations, in order to procure the needed timber. Our lands were accordingly thrown open to corporations organized under the laws of our own State, for

purchase in tracts of 10,000 acres. Corporations organizing under the laws of another State were allowed to mine in our State by conforming to our State laws, rules, and regulations. They had then the same privileges as to purchase of land which were given to our own corporations.

In the session of our legislature in 1876–'77 it was thought desirable to codify our land laws. At the request of my friends in the Lake Superior region, I went to the legislature and assisted in the codification of these laws. In the codification our aim was to reserve and protect the rights of our State and to make the laws simple and intelligible. We had no discussion in reference to the amount of lands which a corporation should hold. As our law now stands, a corporation may obtain and hold as much land as it wishes for. We apprehend no danger from a monopoly of the soil. I know that most of our corporations would be extremely glad to get rid of the land in their possession at any price. Holding it, they are taxed for unproductive property which is not likely to be of the slightest earthly use to them.

Before the government surveys of a considerable portion of the public lands, the War Department assigned tracts of this land to different parties under pre-emption leases. It was found that a particular tract, assigned under lease 98, came within the limits partly of section 16 when the public land was afterward surveyed. One corporation applied to purchase that portion of section 16 which came within the leased lines. It succeeded in obtaining a title to this land from the State by purchase. Another corporation, however, holding lease 98 from the War Department, claimed it under that lease. These companies were respectively the National and Minnesota Mining Companies. By the original land law, permitting pre-emption on location by authority of the War Department, which was passed in March, 1847, it was further provided that the original lessee should have the prior right to purchase the leased land, conforming, however, to the subdivisions thereafter to be established by the government surveys. One party, the National Mining Company, therefore laid claim to the land under their title derived from the State of Michigan by purchase, and the other party, the Minnesota Mining Company, claimed it under their lease from the War Department. The case of disputed title was carried to the Supreme Court. This court ruled that the grant made by the State of Michigan, under the provisions of the school act, to the National Mining Company of any land lying within section 16 was clearly valid. The pre-emption leases held by the Minnesota Mining Company conveyed no title to or prior right to purchase any land within the limits of section 16. The lease conveyed only the right to adjust the leased land to the boundaries of section 16, by granting to the Minnesota Mining Company an equivalent amount of land outside the limits of section 16. The leased land included within the limits of section 16 was the property of the State of Michigan, and had been granted by that State to the National Mining Company. Accordingly the National Mining Company retained the land in dispute, and the Minnesota Mining Company was allowed to adjust their grant under the lease to the boundaries of section 16.

Instructions from the Land Department at Washington require that all surveys shall be made with a solar compass. I have been all over this State (Colorado) and found only one compass—boxed up. I could do the work requisite more rapidly with a solar compass than with a needle. There are conditions of things often in these mountains where an ordinary needle is not worth a snap of a finger for surveying purposes. For instance, I was traveling yesterday over considerable bodies of iron and naturally should not want to depend on such an instrument as the needle in surveying this district.

Testimony of William S. Holt, of Colorado Springs, Colo.

COLORADO SPRINGS, COLO., *December* 26, 1879.

To the Public Land Commission, Washington, D. C.:

GENTLEMEN: If it be not too late to reply to your circular letter relative to the public lands of this State, which press of business has prevented me from giving earlier attention to, I beg to say:

First. That I have resided in this State during the past six (6) years, during which time I have been largely engaged in the business of stock growing, including horned cattle, horses and sheep; that I have been a purchaser of large tracts of public lands, and have had the fullest opportunity of knowing the practical working of the present land laws.

Second. It has been my experience that the existing laws, so far as the homestead and pre-emption acts go, serve their purpose well, especially since the recent adoption of more stringent rules and regulations (such as advertising, &c.) to prevent the perpetration of fraud; and as applied to those sections of the United States (including a small part of Colorado) which are strictly agricultural lands, I do not believe a better

system could be devised, either for the government or the settler. But so far as the bulk of public lands in Colorado is concerned, those laws are and must remain practically inoperative, for the reason that the land is not worth a tithe of its cost under those acts.

I speak now of the eastern one-third of the State, where the chief pastoral wealth is found, for the deep snows in the mountain parks render those otherwise delightful pastures unsafe for large flocks and herds.

You are well aware that the portion of the total area of our State to which the existing laws are at all adapted is very small, compared either with our whole area or with such States as Kansas and Nebraska.

If an exact inquiry were instituted, I suppose it would be found that of the eastern one-third of Colorado not one acre in the thousand would (probably) ever pass out of the ownership of the government, under the present land system.

This eastern third of the State is (mainly) dry, upland plains, destitute of water, treeless, and barren of all herbage except a stunted growth of tough (but nutritious) grass too sparsely scattered to cover the ground or form a continuous sod. This is the character of all the State east of the 27th parallel except in the immediate valleys of the Platte and Arkansas Rivers. There is no water with which to irrigate the land. The scant streams and intermittent springs (mostly dry by July or August) are from 10 to 25 miles apart and afford barely water enough for stock to drink. Such land, you are aware, no man will *settle* upon or purchase under the existing laws. It is and must always be (in spite of our honored Senator Hill's bill for artesian wells) fit only for grazing purposes, and to this great industry the existing laws are extremely inimical. They render the practical stock grower necessarily nomadic and prohibit him from surrounding himself and family with any home comforts and from fencing and otherwise improving the land he occupies but cannot own because the government (with unconscious absurdity) demands that *he* shall pay the same price per acre for lands 20 acres of which will scarce support a single cow and calf per annum as the *farmer* pays for his garden and wheat fields, worth twenty times as much, and of which, if he buy any, he must buy several square miles. To attempt to do this would, of course, be folly. Hence, he "squats" on the government land by some spring or "water-hole," builds the cheapest hut possible in the side of some bank (a "dug-out"), builds no improvements, invests his profits elsewhere, has no *home*, and lives a nomad's life of squalor and discomfort. Not that he *prefers* this. He would gladly buy the land he occupies, fence it, erect comfortable and substantial (and above all *taxable*) improvements, and live like a "white man;" but he has *no choice* in the matter, for the traditional $1.25 per acre is as effective a prohibition as if to buy were a penal offense unless the man is a fool. Nor does the system of "offering" land, as now practiced, help him any. Not an acre of land has been offered in Elbert and Bent Counties, where my stock chiefly graze, since I have been in the county—six years. And even if offered at $1, or even fifty cents, per acre it would avail him nothing. He would be about as foolish to buy his grazing lands at fifty cents per acre as at $1.25; either experiment on these lands would bankrupt him. But there is a price which he can afford to pay, although the increased taxable wealth which would be created in one year by *giving* the actual occupier of the arid lands a good title to them upon condition of his building, say $1,000 worth of permanent improvements for every 20,000 acres, would amply compensate for the gift, to say nothing of the vast collateral benefits which would result to the State from such a policy—benefits greater in proportion to the magnitude of the gift than the government can hope even to reap from its lavish donations to ring corporations.

But I do not advocate the *donation* of these lands to anybody. Let the stock grown pay *a fair price for them*, proportionate to their actual *productive value* as compared with *arable lands*, and let this price be determined by *careful inquiry and comparison of facts*. When this is done, and a price is fixed upon these arid plains at which the stockman can buy them with *safety*, which would be only common justice on the part of the government toward both classes of her citizens, the farmer and the beef and wool grower, no one at all familiar with the business need be told what will be the result. Hundreds of thousands of acres will be bought and fenced, stock will be rapidly improved in grade, permanent improvements will be built, the stock grower's spare capital will be invested at home, schools will be set up, and the nomad will have a house.

I know many men who feel keenly the injustice of the government in persistently keeping their vocation (of so great national importance too) under the ban, and themselves exiles. They would gladly purchase their range and improve it; and are eagerly looking for some speedy move on the part of the government in that direction. What the price shall be must of course be determined by intelligent comparison of the dry upland acre with the fertile valley acre. My own opinion is that the ratio of actual productive and probable market value of the former as compared with the latter, in this State would be about as one to twenty.

Where lands are already occupied the present occupant should have the prior right (for say 2 years) to purchase; and as water is indispensable to stock pastures, each

man should have the right to buy the land half way to his next neighbor's spring or water-hole. This rig ht should of course be limited to a reasonable period; *after which* if the owner of the contiguous water or its occupant did not choose to purchase his half of the range it should be thrown open to all the world to buy.

Not less than 15 acres of our *best* grazing lands are requisite for every head of horned cattle; and from 5 to 7 acres for a sheep. Horses require more than either. The annual loss to the State resulting from lack of fences, such as direct loss of cattle and enormous expense of hunting for them all over the country each spring and the mortality among cows and calves incident to and inseparable from the "round-up" system (necessitated by lack of fences) is something enormous. All this would be avoided if the government would permit us to *own* our lands or even to rent them for long terms at a nominal rental.

Very respectfully,

WM. S. HOLT.

Testimony of J. C. Jones, West Las Animas, Colo., relative to pastoral land, pastoral homesteads, agricultural land, and cattle raising.

TRINIDAD, COLO., *September* 6, 1879.

J. C. JONES, of West Los Animas, Colo., made the following statement:

I have been in the cattle business for twenty-five years in Texas and California. I have about 16,000 cattle. My range is about 50 miles long and 30 miles wide, part in Las Animas County and part in Bent County. Most of it has been surveyed into townships. I own about 1,800 acres to which I have government title, and on which are water privileges. The county is slightly overstocked. We have some trouble with sheep. I think it would be better to keep them by themselves, apart from the cattle. I do not think they improve the earth; on the contrary, I think they injure it for cattle by reason of their running over it and trampling it down, and they crop too close to the earth and leave a scent on the ground so that cattle will not run where they have been. I do not think the water privileges are yet all taken up. Taking it winter and summer I think it will require 30 acres of land to support one beef. I have one pasturage of 160 acres of irrigated grass that will sustain about 40 head of cattle year in and year out. The altitude in Las Animas County is about 6,000 feet, but in Bent County it drops down to 3,000 feet. I think the parties occupying these lands ought to be allowed to get titles to it from the government, and I think 10 cents would be dear for it. I would not sell it in unlimited quantities, but I would protect those who are there now. I am in favor of the pasturage homstead and I would give each one 3,000 acres; but I think the settler ought to be required to improve the land. There is no hope of this land becoming agricultural land, at least in the portion of country I live in. I do not suppose that there is more than one acre in 1,000 that is cultivated for agricultural purposes, and what agriculture has been has not paid. I can send away and get vegetables and corn cheaper than I can raise it. It costs about three times as much to raise it as to go east and get it.

My cattle market is in Kansas City, Mo. I do not know where the cattle go after they leave Kansas City. Cattle dealers in Kansas come to our State and purchase cattle and feed them on the surplus grain of Kansas. We have a place in Kansas now where we have about 1,200 steers fattening for market. You take a steer worth $25 from here to Kansas and fatten it for market and it brings $40. These steers cost us about $22.50, and we sell them for $38 or $40. There are vast numbers of these cattle taken to Kansas for this purpose. If these herds were not raised here and taken to Kansas, there would be no use for the surplus grain grown there. I think that about 100,000 head of cattle have been taken out of this State to Kansas to be fattened for market.

I think these questions of homesteads and disposition of the land ought to be attended to right away, for if it is not it will lead to serious conflicts. In fact it has done so already. There are quite a number of such cases now.

Testimony of A. J. Lamb, cattle-grower, Pueblo County, Colorado, relative to agricultural and timber lands.

The questions to which the following answers are given will be found on sheet facing page 1.

MUDDY CREEK, PUEBLO COUNTY, COLORADO,
September 26, 1879.

Question 1. Name, &c.—A. J. Lamb, Greenhorn Creek, Pueblo County, Colorado; occupation, a cattle-grower.

2. Have lived at my present residence twelve years.

3. Have acquired title to 160 acres under the soldier's homestead law.

4. Only through the perusal of newspapers.

5. A person can get his title at this (Pueblo) land office any time after six months from the date of his filing on any tract of public domain. The expense attached thereto varies from $40 to $60.

6. Do not know of any defects in the land laws; none, however, have come under my personal knowledge.

7. The lands in this section are chiefly broken (apparently by volcanic eruptions) with some open prairies. The lands are principally pastoral, and a very small proportion susceptible of agriculture. No indications of mineral in this section, and no timber excepting along the base of the mountains.

8. I think the lands here should be designated desert lands, and this rule I believe will cover the entire area of Southern Colorado, as in some parts sand predominates while in this vicinity the general aspect is broken and very rocky.

9. I would recommend that the actual settler be entitled to the lands covering his water-front half way to the next stream, both ways, as the lands out from the creeks are valueless unless the person owns the water.

10. Would recommend that the actual settler be entitled to a homestead of, say, not *less* than 2,500 acres, and such of those that wish to purchase more land be enabled to buy it at a price not to exceed 10 cents per acre, as I do not think it would bring more on the market, for in buying a tract of land one must buy some that not a blade of grass will ever grow upon. And again, this would return a handsome revenue to the general government, as well as bring more taxable land in the county. And, also, that it be sold in parts, to allow the actual settler an opportunity of purchasing land, for if sold as a whole the lands would perhaps be bought up by speculators, to the detriment of old settlers. And here I will add that the pioneers have taken up all the lands along the creeks, and, of course, the lands lying away from the water are of no account to any one. However, if large companies of capitalists should come in here and buy up this land, they would either compel the cattle-grower to pay exorbitant prices for the land, or else to move his cattle.

AGRICULTURE.

1. The climate is good and healthful; the seasons are rather short, I suppose on account of the nearness of the mountains; the rainfall is light in the spring of the year. As to the snowfalls in winter, this is variable, as some winters it is heavy, while others the fall of snow is light. The supply of water depends altogether on the amount of snow in the mountains, as all the creeks here are fed by the snow in the mountains.

2. The rainfall occurs from the middle of July to the last of August, and comes very irregular, as it sometimes inundates the whole country. This country is subject to waterspouts, and when they break it floods the whole country; and the waterfall comes too late in the season for irrigation.

3. There is not any land that will raise a crop without irrigation in this country.

4. Taking one hundred as a maximum, I would say that not over 5 acres in every 100 is fit for cultivation, as none but the low bottoms on the creeks can be farmed at all. The bottoms are very narrow, and, besides, the streams do not supply water enough to irrigate what land could be farmed.

5. Corn, wheat, oats, and barley, with vegetables of all kinds, can be grown here, providing there is sufficient water to irrigate them. There is, however, not enough of these raised in this country to supply the demand, owing to the frequent droughts, the grasshoppers, and the expense of irrigating. The above-named articles can be and are shipped in here from the east for less than they can be produced here. This is decidedly a cattle country, and useless for anything else.

6. The water is run in ditches and is not gauged, as the custom here is that where two or more own a ditch jointly they use the water day about; and, besides, I have never seen a hundred-acre wheat field in Southern Colorado, and therefore have no way of deciding the quantity of water required for that amount.

7. The source of all the water, and the supply, depends altogether on the amount of snow in the mountains. This season the supply has been short.

8. From my own observation I would say that the land is not injured any way by

irrigation. Small grain, such as wheat, oats, barley, and also potatoes, can be grown at an altitude of 6,000 feet in the mountains.

9. When the streams are low the water is generally all exhausted in the ditches. The common rules are that when the ditch is running full that all the owners of the ditch may use the water at the same time. What water is not used is voluntarily returned to the creek. We have, however, good water laws in Colorado.

10. The settlers have taken up all the water by entering or homesteading the land laying on each side of the creeks.

11. No conflicts about water of any consequence to my knowledge.

12. About 95 per cent. of the lands are adapted for pasture only.

13. I think it practicable to establish homesteads of 2,500-acre lots. This amount of land will about keep 100 head of cattle; but I do not think any one wishes to confine himself to only 100 head. Some cattle men own from 2,000 to 5,000.

14. I think it advisable for the government to put these lands (outside of the beforementioned homesteads) on the market *for private entry*, and let every *settler* be allowed to purchase such quantities as he is able to, providing he takes lands opposite his water-front.

15. The pasturage in the northern part of the State is much better than this, as there is as much grass growing on one acre there as on three here, and I do think it will require at least 25 acres of this grass to keep one beef and fatten it for the market.

16. A family can eke out a livelihood on from 100 to 150 head of cattle of all kinds.

17. It is impossible for me to say how many cattle there are to the square mile here.

18. The growth of grass has diminished and is not so good a quality for winter as formerly.

19. There have been some few small pastures fenced with good success. If cattle have shelter to protect them during storms they can be confined in pastures in safety in winter.

20. The quality of herds would be greatly improved by inclosing the cattle in pastures and a larger increase in calves be obtained.

21. Cattle have to come to the creeks for water, excepting during the rainy season, when water stands in shallow holes on the prairies; but this is of short duration; the creeks are the main supply.

22. I think that two sheep will destroy as much grass as one beef. Owing to the dry seasons here the grasses are cured early, and the sheep, going as they do in a compact flock, cut the grass down. It is not what the sheep eats, but what he destroys.

23. The growth of grass has diminished more so where sheep have grazed than where cattle or horses have used.

24. Cattle will not feed where sheep have grazed unless they are inclosed in pastures.

25. Southern Colorado was first settled by cattle men, and when it became civilized the sheep men rushed their flocks in and drove the cattle from their accustomed range, and hence there is no friendly feeling existing.

26. There are between 30,000 and 40,000 head of cattle in this county; they run at large and all mixed together. There are from 12,000 to 18,000 head of sheep in this section, herded in flocks of from 300 to 2,000.

27. I would suggest that the public lands be disposed of in the manner stated above, and think it the best way.

28. The corners can be readily found in this locality.

TIMBER.

1. The only timber there is in this vicinity is a scrubby growth of cedar and pinon, useless for anything but fire-wood and shelter for stock.

2. Not any timber planted here.

3. There is no grass growing on this timber land, and I think it would be best to let it go as the other public domain. It would answer for shelter for stock.

4. This being the only variety of timber, it would be useless to classify it or put it up separately for sale, as no one wants it for the timber alone.

5. There is a second growth, apparently, but it is of such a slow growth that it takes almost an age to acquire any size.

6. The forest fires are chiefly the work of the Indians, who fire the timber to drive the game. The destruction of timber has been very great in the mountains. The only way to stop the fires is by heavy rains falling, or send the Indian where he won't have to start a fire. (Original.)

7. In this immediate vicinity the timber is not worth depredating upon, but along the base of the mountains the waste has been very great by railroad companies cutting ties. Would advocate the legislation of some laws to protect the timber.

8. It is customary for the settlers to go to the nearest point for fire-wood. Corporations, as railroad companies, go to the best timber and cut what they choose for ties, bridges, and other purposes.

9. We have at this land office very efficient officers, and I think the timber laws would be better executed if under the administration of district offices.

MINES.

Have had no experience in mining; consequently have no idea about it; so will not try to answer those questions.

Respectfully, yours,

A. J. LAMB.

Testimony of J. B. Low, mining engineer, Denver, Colo., relative to mineral laws, &c.

DENVER, COLO., *September* 2, 1879.

J. B. LOW, residence at San Francisco, Cal., but temporarily resident in Colorado; occupation, mining engineer.

In mining litigation I have always aimed to compromise contests, and hence have had but little direct connection with actual cases in court as party or witness, but have been more or less mixed up in the Comstock litigation and have had indirect connection with much of the mining litigation all over the country. My connection with mineral matters has continued ever since there has been mining in California.

Under the present system parties can first locate their claims with no other restrictions as to locality than their own pleasure, and can also similarly secure surveys from the government, putting, if he pleases, his location or survey directly over the previous one of another party. In my opinion this practice is simply awful, and leads to interminable confusion and litigation. The instances are so numerous that it would be almost impossible to enumerate them. Hence nearly every application for patent is adversed by numerous parties, and I know of scarcely an instance of a mine of value where such is not the case.

Literally speaking, the apex of a vein is its highest point; but in my understanding the correct meaning of the term is that if a man sinks a shaft and strikes a vein, the point of discovery is his apex, and he should be entitled to hold the dip, with the understanding that some subsequent locator may have struck a higher point in the same lode.

The top or apex, the course, and angle or direction of the dip cannot always be determined in the early workings of a lode, because there are frequently derangements in the course of a vein by movements of the upper surface, so that he may at first suppose his vein to run in one direction, when by going deeper he finds that its course has been changed by such displacements. For illustration, a vein may apparently enter the side of a mountain at a given angle and course, but it subsequently proves that at some time the surface of the mountain has slipped down and broken off the vein, thus leaving a break between the two parts; or again, the upper end has been bent over parallel to the surface, but after going down a certain distance the vein turns down into the earth.

In view of these and similar facts, and inasmuch as foregoing technical terms are essential parts of existing law, the rights of a discoverer are not properly protected. The law compels a discoverer to locate his claim by these terms, instead of putting it upon the actual discovery of mineral. A man almost necessarily has to locate his claim before he has made sufficient development to tell certainly where his vein runs. If he does not do so, he is liable to have a prior location put over him. If he does do so, and makes a mistake through reliance upon the surface indications, he is without remedy and loses the benefit of his actual discovery of mineral. Within my knowledge, and frequently, litigation and injustice have grown out of the impossibility of determining the above points in the early history of a mine.

Have often known of two veins, parallel or otherwise, of the same outcrop being located by different parties and giving rise to contest. It frequently happens that the country rock has fallen in upon the outcrop, so that the vein matter is divided for many feet—sometimes more than a hundred feet—and different parties may innocently locate upon both of these veins, but when they have gone down find the vein matter to unite, and hence a conflict. I have known of cases where in such contests the original locator has been cut off in depth by the later locator.

The outcrops of veins are often much wider than the legal width of claims, whether under State, Territorial, federal, or local laws. Frequently the outcrops of narrow veins deviate from a straight line and pass beyond the side lines of the claim, owing mainly to the irregularities of the earth's surface. They may be covered over with *débris* or float, so that it would be impossible to tell the true course of the vein.

The practice under the present law of permitting locations on alleged mineral ground, but without certainty of actual mineral, works to the disadvantage of discov-

ers of true lodes. To a certain extent an unlimited right to locate and take the claims of subsequent discoveries operate to the encouragement of prospecting; but on the whole it works to the advantage of mere jumpers by permitting them to watch until a valuable mine is opened, and then by locating in barren ground adjoining to sink a shaft to the dip of the other man's mine. Then the first party, and who really discovered the lode, has to go into litigation and can only get rid of the jumper by tracing out the identity of the lode and thus digging out the jumper. This destroys the profits of the mine and discourages the operators. As an illustration, the Twin mine in Leadville district furnishes an excellent instance. Discovers of rich veins or their assigns are often burdened with costly litigation—ruinously so—to defend their rights against subsequent locators, and almost invaraibly such legal attacks are directed to the part of the dip which has passed beyond the exterior line of the surface tract.

I have thought a great deal about the question whether this unlimited right to follow this dip business could be continued or controlled in any way so as to make it feasible, and I have talked with many other parties on the same subject; it being known to us all that many camps have been destroyed and abandoned from this cause; but none of us have been able to see how the dip idea could be retained and avoid the ruinous consequences which have uniformly attended it.

I have taken part in organizing mining districts, and have been chairman of a committee for such organization. First a notice was published by any one who chose to issue it, presumably to the miners in the immediate vicinity, but usually intended to reach the party's immediate friends, and to the effect that a miners' meeting would be held, generally without saying what it would be for. Upon assembling those present proceed to define the limits of the district; to prescribe how large a claim can be located therein; to elect a recorder, whose general duty it is to record anything that is brought him, and to pass any regulations in their pleasure for the government of the location and development of mines in their geographical limits. Sometimes only sufficient parties are present to fill the offices, viz: presiding officer, secretary, recorder. Districts have probably been organized by only three or four parties, and I have personally known them to be organized by nine persons. These parties are not necessarily either actual miners, residents, or citizens of the United States. No inquiry is made upon these points, it being assumed that by coming to the meeting they are qualified. The recorder's duty is to keep a record of any location offered by him; and as his compensation is by fees, his natural interest and tendency is to accept and record anything offered him. Whenever called upon to do so, he gives a copy, certified by himself, of the record of such papers, a fee therefor being charged for his use and benefit. I have never known any security to be required from such recorder for the faithful performance of duty, and the honest performance of same is entirely dependent upon his personal integrity. As a rule no body of men, jumping up in the wilderness, excel the miners in personal integrity and a general intention to do the right thing; but they are often unacquainted with the conformation and wants of their section. They are usally gathered together suddenly by mineral discoveries, and have not had time to understand their real necessities. The situation compels them to hasty and illy considered action.

The mode of locating a claim in such districts is as follows:

A prospector discovers an outcrop with a blow-out, or blossoms rich in mineral ore, and he supposes the lode to run north and south. He at once stakes out a claim according to the laws of that district, if one has been organized. If one has not been organized he stakes out according to his own notions, or to the laws of some district in which he had previously resided. He takes one claim for himself by right of discovery and one as locator, and then uses the names of various friends to make enough other locations to cover what he thinks would be the lode. He sticks up on a tree or rock a notice of his claim, describing it in vague terms by natural objects, as a tree, or peak, or ravine, &c. Then he hunts up the friends whose names he has used, and tells them what he has done. He says, "John (or Jim), I have discovered a mine and used your name to locate it, and want you to give me a deed of your interest." A deed is executed for the nominal consideration of $1 which puts the whole claim in the one party, although upon the notice stuck up on the claim for the information of the public there are a number of parties. Then he goes to the mining recorder and records the notice.

The effect of that record is similar to any other public record, and is usually held sacred. That original location goes into the courts, and, no matter how indistinct the notice may be, it is the basis of the mining title, and the courts must get at the intention of the party as best they can when the party subsequently makes application to the United States for a mineral patent. A copy of this certificate of location, certified only by the mining recorder, has to be accepted by the government as the sole evidence of location, and is the foundation of the entire proceedings.

Whether that record can be subsequently amended depends upon the original law

of the district. Laws sometimes allow amendments by a two-thirds vote of the miners in the district, and the laws themselves can be changed by a similar vote. Within my knowledge mining titles have been disturbed and litigated through fraudulent manipulation or destruction of these mining records. I have known instances where the entire records have been spirited away for purposes of speculation or to aid one side in a lawsuit; where they have been destroyed in whole or in part; where they have been changed by erasures or interlineations, &c. I know of no security against the perpetration of such frauds, and in case of their destruction there are no means of reproduction.

In my opinion, all mining district laws, customs, and records could and should be abolished, and the initiation of record title be placed exclusively with the federal land offices, just the same as is the practice under all other laws for the acquisition of titles, inceptive or consummated from the United States.

Undoubtedly the adjustment of controversies concerning mineral lands and prior to issue of patent should be left absolutely to the United States land offices, in the same manner as contests under all other land laws. The main reasons therefor are as follows: The great delay and expense in the courts, and the practical impossibility of getting a hearing therein within any reasonable time. The operation of mines are often stopped by injunctions and cross-injunctions upon suits in court, where the said court does not hold more than two terms in a year and then adjourns in a week or so without trying a mineral case. Parties have to bring up and hold together a cloud of witnesses at great expense, and often bring them up term after term. A fairer result can necessarily be obtained from a trial before an officer far distant from the locality of the controversy than before a jury from the immediate vicinage, and the absence of taxable costs in the executive department of the United States saves parties litigant great expense.

Believing that the practice of following the dip beyond the side lines of a claim is incompatible with satisfactory administration of the mining laws, I would suggest some such method of location as the following:

Square locations with vertical lines in area of not less than 40 acres to each claim, and not to exceed 160 acres. They should be surveyed in the first instance by a government surveyor, and thereafter the party should be required within a stated time to complete his title from the United States—say in about one year. I would not permit any survey to be made in conflict, in whole or in part, with any previous survey still in valid existence; and I would permit the party to purchase from the government an end for the stated time, without reference to whether he had or had not actually discovered mineral. At end of the year, if the party failed to pay in his purchase-money, the survey on file should be canceled and the tract be opened to any other party.

I have owned and worked placer claims on a large scale. I have not known of titles obtained under the placer law for absolutely non-mineral lands, though such claims naturally may have stretched out so as to include lands not containing mineral in paying quantities. Of course parties suppose the lands to be mineral when they take them up; and if they prove not to be so the price paid to the United States is large enough to remove any reasonable objection to the transaction.

I think that lode claims have been taken up under placer claims, but do not think it was the original intention of the parties. They have usually been discovered in washing off the surface while washing the placer claims. In such cases the placer claimants should be entitled to anything they find under their claims.

I know of valuable placer lands where the claimants have been obliged to purchase from adjoining parties other lands in order to secure an outlet, without which outlet the mine could not have been worked. I think that placer claimants should in some form be entitled to locate a right of way or outlets to their claims.

As to mill-sites, I think that the present restrictions as to location on non-mineral lands should be removed. Many parties now have to perjure themselves to secure such location where it is required and where only his mill can be put.

If the system of square locations with vertical side lines is put in force, the tunnel location privilege should be repealed. It would be incompatible to give a man on a surface location everything below and at the same time to allow another party to cut under him with a tunnel location.

Testimony of John McCaskill and others, Pueblo, Colo.

PUEBLO, COLO., *August* 29, 1879.

JOHN MCCASKILL, M. D., president Southern Colorado Cattle Growers' Association, and others, made the following statement:

I should say that on an average it would take 25 acres of the pasturage land of this region to fatten one beef for the market. The grass on the ranges decreases from year to year under grazing. I think the quantity of grass on a range now is about 40

per cent. less than it was seven or eight years ago. There were hay lots then that could be mown, but now they are done away with. At that time there was not one-fifth of the cattle that there are now, and the quality of the range decreased as the stock increased. There are in Colorado now about 500,000 head of cattle, 200,000 of which are in this land district. These are worth at least $2,500,000. I do not think there can be any more cattle introduced here than are here now. They are driving them out on account of the scarcity of grass. Three men moved out of my district last week, owing to the lack of grass, and more than 30,000 head of cattle have been taken from this vicinity on account of the scarcity of grass. They went to the Pan Handle of Texas. Our cattle roam at pleasure, none of the large herders having fences. A better class of cattle could be raised by fencing. I think our cattle would improve from 30 to 40 per cent. if the ranges were fenced. Our cattle are sold in Kansas City, Mo. They are moved by rail over the Atchison, Topeka and Santa Fe and the Kansas Pacific roads to Kansas City. Many of them go to Chicago and also to Europe. They can better afford in the East to pay $4 per acre than we can in this portion of the country to pay 10 cents per acre. Not one out of ten of the farmers south of the divide in this land district can make more than a living. Farming does not pay in this district. The cattle business only brings in 20 per cent. Most of the streams go dry at the season when they are needed to ripen the crops, and in this portion of the country the use of water destroys the good properties of the soil. The water seems to run the soil together like mortar and injures its growing properties, so that the yield of grain decreases from year to year. All the water in the district is used for irrigation, and the area of irrigated land cannot be extended. The capacity of the streams could be doubled, so far as the water is concerned, but the acreage cannot be any further increased.

Any amount of corn, flour, and potatoes is shipped here in the winter, and stall-fed beef is shipped here from Kansas in the spring. This has been the case for the last three years. Mr. Wetzell, secretary of the Denver Cattle Growers' Association, told me that over half a million dollars' worth of beef was shipped to the mountain towns of Colorado from Kansas. Cattle do not fatten here sufficiently for market till September and October, and after that time they do not take on any more flesh. Six or seven years ago cattle could be turned out any time in the winter and they would fatten by spring.

If farming was steadily pursued grain enough could be produced to supply the local demand, but it is not profitable and so it is not done. There are not as many acres of land tilled for agricultural purposes now, by one-fifth, in the county of Bent, which is in this land district, as there were. Huerfano County is in the same condition. In Pueblo County there is not as much farming as there was ten years ago. When everything could be sold to the Army there was no difficulty in selling it, and they got from 4 to 6 cents per pound for their corn; but now we can get our corn for about 90 cents per hundred from Kansas, and that is cheaper than they can raise it. Another drawback to agriculture is the grasshoppers. In Huerfano County, where I live, six years out of seven we have had the grasshoppers, and they cleaned up what the drought left. They did not materially affect the cattle ranges. Another difficulty is that the lands being low they are subject to inundations, and the floods materially injure the crops. Agriculture is very precarious and not profitable. Mr. Pollard, in the county of Pueblo, has 800 acres under fence and tried agriculture. It was well ditched, near the mountains, and favorably located, but he failed, as the water has been out of that locality for two months. The water does not come at the proper time. The great supply comes in the spring, and when they need it, it is all gone. Mr. B. B. Field, cattle owner and farmer, in Pueblo County, has 1,000 acres of land that six years ago was assessed for $40,000 and now it is assessed for $8,000. If the cattle men had the land there would be no agriculture, except enough to raise a small amount of grain for stock purposes. The place that I occupied seven years ago they wanted $3,000 for, and three years ago I bought it for fifteen cows and calves. This is agricultural land, under fence and ditch. When the railroad came in it so lowered prices that agriculture was no longer profitable. I think that there is at least 3,000 owners in this land district and they average two employés each, making an aggregate of about 6,000 employés, and the value of agriculture as against stock-raising is about as one to six.

There are in this State about 400,000 sheep, and I think that about 250,000 of them are in this land district, and they are worth at least half a million dollars. It is very injurious to a cattle range to feed sheep upon it. The sheep nibble very close and their feet are so sharp that they cut the grass and the wind blows the grass away; then, too, the grass being eaten down so close it does not come up again readily. They also destroy the winter range. While the cattle are gone up on the summer range the sheep come along and eat up the winter range. If the ranges were fenced this would be obviated. There is much trouble with jumpers. The Texas cattle man will come along, and, if he finds water, he will locate on your range and eat it all off, just as the sheep men do. When the time comes to pay taxes they move off. There is a row between the cattle and sheep men all the time on account of the inroads of the sheep

upon the cattle pastures. This could all be stopped by fencing. If the land could be purchased in large tracts this would settle the whole matter; of course giving both an equal chance to buy. The jumpers and Mexicans do not wish to have fences, because then, if they owned the land, they would have to pay taxes and could not roam where they please. On account of the dry climate sheep require a great deal of water, differing in this respect from the Eastern States. Because of the inroads upon the ranges, sheep men are fighting among themselves. Owing to the fact that the ranges are overstocked with sheep, the grass is being eaten out completely and the ranges entirely destroyed. Some men on the Chico are commencing to fence the public domain. As a result of this, some of their neighbors are having their ranges taken away from them. If the opportunity was offered they would buy this land at low prices, but as they cannot buy it there will be trouble.

The difficulty about fencing the public land is this: One man fences and another fences and another, and when it comes to be entered properly in the land office the person making the entry will be resisted by the persons who are in possession, when he goes to take up his land. This causes a great deal of difficulty and often bloodshed, inaugurating a sort of "squatters' war." If the lands could be purchased from the government in large tracts and fenced, a better class of cattle could be produced. One half of the cattle that we now have would then produce as great a profit. The grass is running out so that the cattle will not get fat enough for market, and they will be compelled to take their beef cattle off to fatten them. Last winter and this winter too we buried in Pueblo County 3,500 head of cattle that died from starvation. By taking the beef off and fattening them in Kansas, you can support just that many more stock cattle. If the stockmen could buy their ranges they would build good houses, make permanent improvements, and live there; but as it is now, they do not make homes there. If you go into the country now, you will see only one-story log-cabins, because they do not know how long they will be able to live there.

The increase of 100 head of cattle would keep a man with an average family. I think the pasturage land should be disposed of at a price that would enable a man to acquire sufficient to sustain 100 head of cattle; that is, about 2,500 or 3,000 acres. This would be about equal to the agricultural homestead of 160 acres. This land is not worth more than 10 cents per acre, and if it is disposed of, the sheep and cattle men should have an opportunity to enter land in proportion to their stock, provided they availed themselves of the privilege within a certain time after the passage of the act. Perhaps it might be well to dispose of this land at a price which decreased from year to year as the better class of lands were disposed of.

Five sheep are about equal to one beef, and in taking a pasturage homestead this ratio should be observed.

Question. Are the water rights all taken up in your county?—Answer. Yes, the water rights are all taken up.

The following members of the association being present, concurred with Mr. McCashill in his statement: D. B. Berry, secretary of the association, M. B. Price, Ludwig Kramer, Geo. M. Chillcott.

Suggestions to the Public Land Commission by N. C. Meeker, White River Agency, Colo.

WHITE RIVER AGENCY, COLO., *August* 25, 1879.

SIR: I have received your circular letter; also, Major Powell's "Lands of the Arid Region." There are so many points on the subject of the land laws requiring the most careful consideration that I do not feel prepared to recommend any changes as regard homestead and pre-emption, and I say this not because changes ought not to be made, but because I doubt whether they would produce the desired result. When we made the settlement at Greeley, Colo., we were greatly embarrassed by the land laws, because they were not framed to apply to an arid region, since in no case do they recognize a right to water as being attached to the realty. On the contrary, decisions seemed to be adverse, as to waste the water of a stream had been forbidden. But in our important enterprise we were forced to attach water to real estate, and this we did by the power of our corporation, which, owning the water under the law, granted its use in perpetuity to all colony members. This plan worked well in every particular; indeed, it is a perfect success, but like success has not, so far as I have been informed, attended any other colonial enterprise, for the right to water has passed into the hands of capitalists, and it is sold to the cultivators of the soil at an annual rent. If settlements could always be made as our settlement was made, and be carried out to the end as we carried it out, changes in the land laws would be desirable. It might or it might not be worth while to incorporate a principle into the general land laws which must underlie the title to water, viz, that priority of appropriation gives priority of right; but I think this is embraced in our State constitution, and perhaps in judicial decisions. It

is a principle fully important as any principle in regard to the title to land itself, and its disregard would destroy the finest farm regions and cities and towns in one-half the territory of the United States, for if it shall be granted that water is free for whoever wishes to take it, and at any time and in any place, our whole system of local legislation and usage will be overthrown. A most important question in connection with this principle is whether priority covers what the line of the survey of a ditch is capable of watering, or only the actual capacity of the ditch at the period of time priority is claimed. I do not think we have yet had any decision on this point, but it is absolutely certain to arise.

If any new laws can be enacted and put in force that shall preserve the timber of the mountain regions and even of the valleys of the rivers, great good would follow. The destruction of timber is largely by fires, and as Major Powell states more by Indians than by white men. Indians look upon timber as of no more value than rocks, to be used if they need. Thousands upon thousands of acres of pine, aspen, and cottonwood are fired every year that the squaws may readily get dry wood the next year, a short-sighted way of providing for the future. A great danger arises from the destruction of mountain forests, since when destroyed the snow melts quickly and the rise of the rivers is early in the season instead of later when so much needed for irrigation. Whether cultivation has an appreciable effect in an increase of rainfall is doubtful. Precipitation of moisture depends on elevation relative or direct, more than any other cause. Salt Lake did rise a few years ago, and the argument in favor of cultivation would have continued good if Salt Lake were not now falling. The area of cultivation in comparison with that of the pastoral, in all arid countries, is exceedingly small; everywhere evaporation is rapid, and human influences and efforts can have but little effect on natural ones.

New laws should be enacted in regard to the pastoral lands. They should be rented for a series of years, twenty, thirty, or forty, at a nominal sum, and in parcels ranging from a section to two or more townships. This plan will permit men of small means to commence the stock business and give men heavily in the business wide range, and both can then arrange for summer and winter grazing. Whatever government might get in rent would be a gain, because these lands cannot be sold, certainly not at present prices, while stock growing would become fixed on a permanent basis and the grades of cattle and sheep would improve. This plan would remove a business now run on community principles to one run upon individual responsibility.

All these hints are submitted with great diffidence.

Respectfully,

N. C. MEEKER.

Capt. C. E. DUTTON,
Secretary Public Land Commission, Denver, Colo.

Testimony of Henry H. Metcalf, River Bend, Elbert County, Colo.

DENVER, COLO., *August* 20, 1879.

HENRY H. METCALF, River Bend, Elbert County, Colo., testified as follows:

Question. What is your business?—Answer. Cattle raising.

Q. In what section?—A. On the Big Sandy, Elbert County, Colorado.

Q. Do you own the land on which you range your cattle?—A. Only my homestead and pre-emption.

Q. What amount of cattle have you?—A. Twelve thousand head.

Q. Over what amount of territory do they range?—A. I allow them to range 45 miles to the east; that is along the river, and 18 miles to the west.

Q. How far north and south?—A. To the Platte 85 miles. South they run about 40 miles. I consider them home in that distance.

Q. Now, then, how much territory would it take, supposing you owned the whole of it, and they were fenced, to sustain these animals?—A. I would not dare to put the animals inside a fence without allowing 20 acres to the head.

Q. Do you think in your region 20 acres to the head would be sufficient in all years?—A. In the *average* year it would; but even then if they were fenced, in the event of certain storms which we have, as you know, I would rather my cattle should be outside of the fence anywhere, in preference to having them stop moving. I would not dare to allow less than 20 acres to the head. In Texas they allow 5, but you know there is more grass in Texas than here. Wherever there are any large water-courses I should allow more than that, for a large part of such land would not have any grass. They annually kill it.

Q. I understand you to mean that around water-courses where cattle drink the grass is necessarily stamped out?—A. Yes; it is all gone.

Q. Suppose, in this ideal plantation, in which every one fenced stock in, with 20 acres to the animal, what distance around each spring and along the rivers would be trampled out and rendered barren?—A. With us, along the Sandy, a strip 500 yards wide is trampled out. The cattle go down to drink, come out to paw and lie down, and then go back a second time and drink.

Q. Do you notice any very great variation in different years of the amount of grass?—A. Oh, yes.

Q. Can you express that variation in percentage? Does the grass vary 10 per cent., for instance?—A. No, I don't think it does. You can notice a great variation now from the last two years. Three or four years ago we had more grass than now.

Q. Suppose there were no cattle on the range, do you think that the variation in the climate of each season, or the different seasons, would greatly vary the amount of grass?—A. No, I do not think so.

Q. Do you think the country is gradually losing its grass?—A. I do.

Q. Can you express that in percentage, during the time you have known the country?—A. I do not think we have within 25 per cent. as much grass as we had in 1872. When I took my own range up grass was waist high, and there were no cattle in the country then; now look at the range outside of the section I have fenced for my calf pasture. Inside the pasture the grass stands high, but outside of it the grass is nowhere near what it was in '72.

Q. Then, in your opinion, the stock which is now in the country will gradually reduce the grass?—A. I think so.

Q. If the present tenure of cattle is maintained, then the life of the grass is limited or regulated by the number of the herd?—A. By that do you mean the ranges are getting overstocked?

Q. Yes.—A. I do not think our ranges are getting overstocked. In the old-fashioned way we had to gather the cattle all in toward our ranges; we kept them within ten or fifteen miles. Now we allow them to go wherever they please.

Q. You do not think, then, that under the present system the diminution of the grass is going on as rapidly as it did formerly?—A. No, I don't. If we had kept the old system up we should not have had any grass at all. There are a great many that do not think so. If I wanted you to move, I might tell you that the grass was getting depleted.

Q. Do you think the country—taking the country at large between the Arkansas River and the North Platte, and possibly far enough eastward from the mountains to reach the limit of the agricultural belt—the grain belt—do you think that the country has all the cattle to-day that it ought naturally to carry, or will it do to largely overstock it?—A. It would not do to overstock. I think the natural increase in the country will stock it.

Q. How soon?—A. In a very short time. We are increasing every year.

Q. When would you put a limit for that great belt of territory, after which you could not increase safely?—A. There are a great many moving out, thinking that this is done for now.

Q. What is your opinion?—A. I should be content to stay there five or six years longer. I think my cattle could live. I should not have as fat beef, but I think the market will warrant me in staying there.

Q. As the great cattle industry grows you can afford to sell your younger cattle?—A. Yes. I should not have any beef weighing 1,400 pounds, but 1,150 pounds is a very good weight.

Q. I understand that you do not own the ground of your cattle range; why cannot you own it?—A. I am not allowed to take up but 320 acres, and I cannot afford to pay anywhere near the price.

Q. If the land was sold at figures which left you a reasonable profit in your business, would you like to buy it?—A. Yes, indeed, I would.

Q. Excluding all purely agricultural land—that is, first, land which needs no irrigation; and second, that which is in the lines of irrigation—and taking only the non-irrigable plains, for what price would you be willing to sell this land if you were the government?—A. Five cents an acre would be enough. Taking it right through it ought to go for fifteen cents an acre.

Q. Could you afford to give that (fifteen cents) for a large tract?—A. It would depend upon how taxes were. I should be willing to pay ten cents per acre, taking it in large tracts.

Q. Standing a 4 per cent. tax?—A. No.

Q. What is the tax in your vicinity?—A. From 13 to 15 mills. I am not certain just which.

Q. Suppose the government should open to settlement for stock-raising the plains land in a manner not unlike the homestead or pre-emption acts; of course it would be necessary to increase the size of the tract so that the average family taking up that homestead or pre-emption tract would be able to live upon it; now, in your judgment, how large a tract of the average plains land with proper access to water, would be

necessary to sustain a family in the cattle business?—A. Between 2,500 and 3,000 acres.

Q. You think that 3,000 acres will support an average family?—A. If a man is contented with a small amount of cattle I should say 2,500 or 3,000 acres would sustain his family; that is, make a living; he would get nothing ahead.

Q. And how would that man compare, as to commercial advantages, with the man who has 160 acres of good arable land?—A. I should say, the same; that is, taking the western land, and the crops year in and year out as they are in Kansas, I think 3,000 acres with cattle would be as advantageous as 160 acres of arable land, or even 320 acres.

Q. In your opinion is it either practicable or to the general interest of the stock industry that the cattle business should be carried on in a small way by individual owners, on tracts of 3,000 acres, or by men with large herds who would be able to control land enough to carry them?—A. I think it would be better in large herds, for this reason: A man with 1,000 head of cattle will have to pay from $1.25 to $1.50 per head a year. My cattle last year cost 60 cents a head and next year they will only cost me 45 cents per head. I can take 15,000 head of stock and run them for 30 cents.

Q. You believe that the advantage of large cattle-raising over small cattle-raising would be greater than that of large agricultural enterprises over small agricultural enterprises?—A. Yes; I do.

Q. State any of the advantages that occur to you of large cattle-raising over small cattle-raising?—A. We allow in gathering cattle in the spring and fall 2 men to the thousand. A herd of 2,000 would be represented by 4 men, but a herd of 18,000 would only require 20 or 24 men. In that way the large owners save. Since stock-raising has come to be carried on so extensively, instead of one we now have from five to seven "round-ups," and small stock-owners cannot be represented at these places, while I can take my men and put one in each place.

Q. What are the disadvantages of small stock-owners not being represented at the different "round-ups"?—A. His cattle are left.

Q. How left?—A. Left there at the "round-ups." He loses his increase in calves, and, besides, his cattle wander off so that he cannot get them.

Q. Do you find in practical experience that the disadvantages under which small raisers labor lead them to abandon the country or go out of the business?—A. I do.

Q. Do you find that they are doing both?—A. No; I don't think they are giving up the business, but they are moving off to other ranges where they are isolated.

Q. Is it a fact, then, that the entire cattle territory of Colorado is gradually being occupied by the herds of large owners and that the smaller ones are all passing to the north?—A. Yes, sir; I believe that will occur. I was telling a friend of mine the other day that in a few years there will not be more than five herds east of Denver.

Q. Does not this centralization of capital become a monster monopoly of the plains?—A. In regard to the smaller men moving off, mind you, it is done just as much for themselves—for their own gain—as it is for the large men. A small raiser takes his 1,000 head off by himself, and instead of getting 65 per cent. increase he goes up to the old ratio of 75 per cent. to 90 per cent. He is by himself and his cattle are there where he can look after them.

Q. But is not the practical result to finally hand over to the very large cattle-owners the entire cattle territory from Texas to British America? Do you not think so?—A. I do.

Q. Do you consider that a benefit to the people at large?—A. The people at large would derive a benefit from it in the reduced cost at which they could purchase their beef. That is where the people would save.

Q. Have you observed a definite, perceptible change of climate during your residence in this country?—A. I have.

Q. Has it been progressive since you first came here?—A. Yes.

Q. In what direction is that change of climate—more or less moisture?—A. More.

Q. Are you informed as to whether that apparent increase of moisture is an actual increase, or is it due to a difference of distribution throughout the year?—A. I cannot say.

Q. As a result do you notice any particular change in the vegetation?—A. That I cannot say, as I don't see much of the vegetation.

Q. You do not perceive a sufficient change in the moisture conditions to indicate that the farm belt is encroaching westward on the cattle belt?—A. No; I do not.

Q. It is not your belief, then, that there is such an encroachment?—A. I know there is an encroachment, because the farmers are trying to raise crops farther westward, but I do not believe that encroachment is due to the change in the climate.

Q. Is it your belief that in Kansas they have reached the limit of successful culture?—A. Yes.

Q. Has the failure of certain crops led you to that conclusion?—A. Yes.

Q. What, in your opinion, considering the interests of the government and that of the stock-raiser, is the best way for the government to dispose of the strictly pastoral lands?—A. Sell them.

Q. You would not welcome the idea of renting for a short period?—A. No; I would not. I do not think anybody would then go to the expense of fencing and making other improvements.

Q. In case the government should throw open for public sale or private entry the entire pastoral land, what method would you advise for preventing non-resident capitalists from controlling the entire country?—A. I cannot say. That would be a very hard question to settle, unless the government recognizes the man who occupies it at present and gives to the residents priority to the extent of their occupation.

Q. I understood you to say just now that it was for the interest of the government and the people at large that the stock ranges should be large in this arid district. Would it not support a large population if the ranges were small and the farmers were allowed to live upon 2,000 or 3,000 acres?—A. No, sir; you cannot divide the land up so. The water controls the land. Wherever there is any water, there is a ranch. On my own ranch I have 2 miles of running water; that accounts for my ranch being where it is. The next water from me in one direction is 23 miles; now, no man can have a ranch between these two places. I have control of the grass the same as though I owned it.

Q. That is, your homestead controls that water?—A. Yes, that is it; my homestead controls that water. Six miles east of me there is another ranch, for there is water at that place.

Q. In an arid country like this, where the conditions upon which people can live and support their families depend upon the water supply, what right have you to take up all the water-front and virtually control the whole country back of it?—A. Because it happens to come inside of my 320 acres.

Q. Then you selected your 320 acres with a view to controlling the water-front?—A. Certainly.

Q. And thus you control the pasturage land back of it?—A. Certainly. That is the way it is all over the West.

Q. Suppose a law was enacted which would make the water common property and provide that the cattle from any range should be allowed to drink of that water, would that not be beneficial?—A. I don't think it would. I think that the water accounts now for nine-tenths of the population that you find in the West on our ranches.

Q. Then if one or two are to control all the water-fronts, is not that operating against the interests of the country?—A. Well, the way our laws are now, it cannot be helped. In regard to homestead and pre-emption, you will find that nine-tenths of the homestead and pre-emption claims are simply water-holds. They hold the land and the water right.

Testimony of Suydenham Mills, miner, Leadville, Colo.

LEADVILLE, COLO., *August* 27, 1879.

SUYDENHAM MILLS, fifty-two years old, miner by occupation, residence in Colorado, testified:

Under present law placer claims upon unsurveyed lands can be patented, and after subsequent township surveys there is no sufficient safeguard against patents for adjacent agricultural claims inadvertently lapping over upon the previous placer patents.

The present placer statutes of the United States make no provision for dump ground or tailings, but the State law requires that each claimant shall confine his dump to his own ground. This often works great injustice, as, for instance, where several claims immediately adjoin each other the lower parties are in position to stop the working of the higher parties by cutting off their outlets. In my opinion the custom which prevailed in most local mining districts when I first came here, in 1859–'60, would furnish a correct rule on this point, viz: that each claimant could let loose the dump from the flume upon his own ground, and the parties below must take care for themselves of whatever reached them by gravitation.

The experience of all miners will approve the absolute extinction of all State, Territorial, or local mining laws, customs, records, and districts, and in lieu thereof to put the whole business under United States law and under the administration of its officers.

The placer law should be better guarded as to requirements of improvements. At present it requires proof of $500 worth of improvements, but does not specify their character or extent, upon the ground. Hence a claimant might have $500 worth of lumber upon the premises, with which to ostensibly build a flume, &c., and upon that secure proof of $500 improvements or expenditures. As soon as his entry was allowed or patent issued upon that claim he might haul his lumber to another claim and make it the basis of proof of expenditure upon said other claim. I would cut off this oppor-

tunity for evading the law by strict requirement of proof that the $500 had been honestly expended in the actual development of the ground.

I do not know of any case of placer patents for lands barren of mineral, and I do not see where occasion for such thing would arise, unless where parties wished to obtain some title upon unsurveyed lands, and were willing to pay double price therefor, without being put to the trouble of pre-empting same.

It is possible to take up lodes through the pretense of placer claims, and I think that I have known of such transactions. There would be two plain inducements thereto, viz: first, the cost of the land would be one-half; second, the claimants could take in a much larger area, which might embrace many lodes.

In matter of lode claims discoveries should be permitted in any form, whether by shafting, tunneling, or drifting. I think that the law as to tunnel claims is too liberal, and that it should be put upon the same footing of other claims as to right by discovery.

Mill-sites might, by evasion of statute, be made to cover lode and placer claims. I can see no benefit in retaining that part of the mineral law. It should be dropped out, as it only complicates matters and opens a door for fraud.

Either a party should be compelled to honestly make double the present annual expenditure to hold a possessory claim, or, better still, a locator should be obliged within a limited time (say one year) to prove up and pay for the claim, or else forfeit his right thereto.

A provision should be made for the benefit of the pioneer prospector, who may have discovered a lode but be without immediate means to work it. I would suggest something like his being permitted, by staking out same with suitable monuments to serve as notice to others, and by filing a declaratory statement with the United States register, to be protected for a very short time in the absolute enjoyments of said discovery. I mean protection against intruders in the exclusive right to explore and work within the surface ground thus staked and filed upon.

Testimony of George G. Merrick, mining engineer, Leadville, Colo.

LEADVILLE, COLO., *August* 27, 1879.

GEORGE G. MERRICK, testified:

Reside in Oak Park, Cook County, Illinois, but have been temporarily residing in and near Leadville for some months past.

I have been connected with mining pursuits, more or less, since 1849, commencing with lead-mining in Iowa, above Dubuque, and engaging in the capacity of a mining engineer in gold and silver mining in Colorado and Utah, and coal mining in Illinois and Indiana.

Before expressing my opinion as to the defects of the United States laws as applied to lode claims, it seems to me proper to state that in my judgment there is a wide difference between lode claims, as the term is understood in the law of 1872, and what I would call contact veins of mineral lying in horizontal layers. In attempting to apply the fissure vein or true lode-claim principle to the deposit claims in this neighborhood a large number of lawsuits have arisen, and the prospect is that these suits will increase in number and importance until the whole mining interest of this neighborhood is inextricably entangled in legal proceedings.

I believe the official practice of filing surveys of lode claims which overlap on the surface to be entirely wrong in principle. I think that a claimant should be entitled to all that is within the area of his ground, and that he should not be obliged to continually defend his rights.

Whether the top or apex of a vein or lode is construed to mean the highest point of that lode or whether it is construed to mean the outcropping of that lode seems to me a very material difference. One is peculiarly applicable to fissure veins and the other is more particularly applicable to horizontal deposits. As I understand the meaning of the word apex, I can hardly apply it at all to contact veins or horizontal deposits. A vein may be discovered, for instance, low down in a valley where it is perhaps a depressed vein. It may be subsequently discovered two or three miles up a mountain, and the point where it passes the crest of some peak, if the highest point, is the apex according to law. Yet, in my opinion, the layer on the mountain has no more an apex than the layer in the valley. I do not believe, furthermore, that the apex or course or direction of the dip can be determined in the early workings of veins or lodes. Holding this opinion, I do not think that the intended rights of a discoverer are properly defined and protected under the existing laws, and I know that very important litigations have grown out of the impossibility of determining these very points.

I have not known within my own experience, strictly, of two parallel seams being located by different parties and giving rise to contest, but I have in my mind in this immediate vicinity a location where such a condition of things may very probably exist. If it does exist, the original locator would almost certainly be cut off in depth by the later locator.

I have in my mind some cases in the San Juan country, where I believe that the outcrops of the lodes are decidedly wider than the legal width of claims even if we take the extreme width of 300 feet allowed by the United States Government.

No case has come within my immediate observation where the outcrops of narrow lodes have so deviated from a straight line as to pass beyond the side lines of claims, yet I have no doubt that this is not unfrequently the case. For example, in cases where the outcrops have made the figure S they would almost certainly pass outside the side lines. .

The practice under the law of permitting lode locations of alleged lodes on non-mineral ground works to the disadvantage of the discoverers of true lodes in this way, viz: that it produces a great deal of doubt and uncertainty in dealing with mineral interests; I mean that it hampers commercial dealings by throwing doubt upon titles or the correctness of all locations.

Under the present law it is undoubtedly true that B, who locates on barren ground a claim parallel to that of A, a former locator, but over the dip of A's lode, can cloud the title of A, the discoverer of a true lode, and put him to the cost and inconvenience of an expensive litigation.

I know of a case where precisely this condition of things exists, and in which I declined to recommend the purchase of a property otherwise highly desirable from the certainty of an expensive and tedious lawsuit attending its development.

It is, as a rule, the case that a large majority of the discoverers of rich veins, or their assigns, are burdened with costly litigation to defend their rights from locators in their immediate neighborhood, and the legal attack in such cases is most often directed to the portion of the dip of the lode which has passed beyond the exterior lines of the surface tract. It is an almost invariable rule in the vicinity of this city (Leadville) that whenever the owners of a claim have developed rich, paying mineral they are immediately burdened with from one to half a dozen vexatious lawsuits, and it is sometimes necessary for them to resort to armed force to protect their rights against jumpers, blackmailers, and other depredators.

I do not think it possible, considering the known variety and complexity of the mineral deposits in rock in place, to retain that provision in the United States mineral laws by which locators can follow the dip of their claims outside their side lines without the danger of provoking litigation.

I have no hesitation in saying that it is the result of my experience in mining camps that the complexity of the State and district laws, rules, and regulations is a productive source of evil, and that the only remedy for these evils is to place the whole matter where it properly belongs—in the hands of the officers of the federal government. They alone should have the power to issue any patent touching the title to mineral lands. Although I will not question the honesty of intention of the county or district recorders, their average intelligence and the condition in which their records are kept are not conducive either to the correctness or the safety of these valuable papers. I may add also that I have known instances where whole books of records have been fraudulently destroyed in order to obliterate certain titles. It certainly seems to me that the adjustment of controversies concerning mineral lands prior to issue of patent should be left absolutely to the officials who are appointed by the federal government.

I think that the mineral lands should be subject to entry under some of the legal subdivisions of the land now in use by the Land Department. I see no way to prevent the accumulation of land even if a private entry was restricted to one or two of these legal subdivisions, and I think the matter should be left to the discretion of the parties desiring to control the land. If it is attempted to limit the amount of land which may be secured in this way, whether to twenty acres or to any other fixed quantity, temptation is immediately offered for perjury, which I would wish to do away with if possible.

The present method of acquiring possessory title is productive of many and very great evils in all mining communities, and it is my opinion that every pre-emptor and every person seeking to acquire title to mineral lands of the United States should be required to perfect that title within a reasonable time, and it is my opinion that no injury will be done to any honest locator by fixing that time so as not to exceed eighteen months under any circumstances, and I myself see no reason why the title should not be perfected within twelve months. In fixing the period of twelve months I am governed exclusively by the idea of dealing with extreme liberality with the prospector or miner who makes the discovery of mineral in the tract of land. No substantial injury or wrong would be wrought to any one by requiring the payment of the cash upon the filing of the application for a patent with the Land Department.

I find that it is a common practice in the surveys of mineral lands to wholly disregard the rules and regulations issued by the Land Department to govern such surveys, and that surveyors are in the habit of surveying lot after lot across each other, paying no attention whatever to the side and end lines as laid down for an earlier locator. These surveyors are paid a fixed price for surveying a claim, and it is, of course, to their interest to survey as many claims as possible without regard to prior rights. Surveys are made also with the ordinary box compass, and when the final surveys are made with more accurate intruments the boundaries of the claims vary in important particulars, and lawsuits without end grow out of this shiftless practice. In my judgment no surveyor should be allowed to survey a mineral claim unless properly deputized by the surveyor-general, and no map of any claim should be made in which the lines of one claim cross the lines of another. Respect should be paid to the earliest locator, and cross-lines should stop upon touching his side or end lines.

In my opinion the present land laws operate in the first place to the confusion and detriment of mining industry, and secondly to the demoralization of the people engaged in mining. Instances have come under my immediate observation where public lands are pre-empted for the purpose of robbing them of their standing timber. Lands are also patented under so-called placer claims for the purpose of disposing of them as town lots, and, in general, in order to secure a large number of mining claims the grossest perjury is committed throughout all the mining districts.

Testimony of Henry Neikirk, miner, Boulder, Colo.

BOULDER, COLO., *September* 9, 1879.

Public Land Commission, Washington, D. C.:

SIRS: In answering your series of questions, I take it that the first contains a typographical error. The word "expense" should be "experience."

Answer 1. I have been engaged in mining for sixteen years, in Colorado exclusively; have prospected from Fairplay on the south to Estes Park or Long's Peak on the north, but have done the principal part of my mining in Gilpin and Boulder Counties; have been foreman of several large mining properties, among which was the "Smith & Parmelee" property on the Gregory & Briggs lodes, at Black Hawk (in 1864–'65), now the New York Company property; also, of the Buell property, at Central City (from 1872 to 1875); have filled almost every position from "*dirt-passer*" to superintendent and owner, and there is nothing about a mine to be done I cannot do. I own an interest now in two mines of this (Boulder) county, both of which I have had litigation over. The Dana or "Hoosier" lode and the Melvina. The litigation on the first named extended from 1866 to 1876, and was dragged through local or district, State, and national law.

2. The law itself has the same objection your question has; it is too vague. "*Lode claims*" is very uncertain. There are so many kinds. The law applies pretty well for well-defined fissure veins whose dip is vertical or nearly so, and for them only do I consider it good.

3. I think it a bad practice, but one it would be impossible without great expense and trouble to do away with, and that the "end would not justify the means."

4. The apex of a lode I understand to be that point at which the vein enters or emerges from rock in place. The dip or course of a vein can only be approximately determined in the early workings.

5. They are not.

6. It has.

7. Never have of same outcrop, but frequently where two outcrops dip or run together.

8. No.

9. They are not. There is more gammon in this than any one other thing in mining. Where it is so wide it is not a vein or lode, and does not run in seams, but lies *en masse*, and is a deposit.

10. Quite often, especially in a few of the older counties of Colorado where the surface is limited in width by local law.

11. To the disadvantage. Just the location will deter others from occupying the ground, although it may be a fraudulent location.

12. The above question or example is answered every day almost and illustrated in the southern part of this State, and arises from trying to govern vertical and horizontal veins by the same rule and same law. What would you think of a law which would allow a man to strike the edge or outcrop of a horizontal coal bank, take up 1,500 feet in length and hold it for any distance?

13. Litigation arises from unimaginable causes, but it arises as much from the new-

ness of the mining country and instability of society as any one cause. Litigation is very often commenced to blackmail. The vagueness of the law and the inappropriateness of it to many cases is very fruitful of litigation.

14. I think it is in all veins in the primary formation, but not in limestone or porphyry.

15. I have in two instances, and both were organized in the same manner, to wit: A call for a meeting was made by several citizens. Upon meeting the people assembled elected a temporary chairman, also secretary, when committees on by-laws, on boundary-lines, &c., were elected. After the preliminary organization was effected, committees appointed, &c., the meeting adjourned for a day or two. Upon meeting again the committees reported a short constitution and by-laws (which was a short code), which were passed upon by the meeting. These laws provided for their own amendment. The "miners' meeting" was considered supreme. They usually had a president, a vice-president, and secretary, who was *ex-officio* recorder, who kept a book for the record of claims. There was in some districts in this State in very early days miners' courts established by the people of the districts, and a corps of executive officers, headed by the president of the district. At present all authority is assumed by the State.

16. The usual method adopted was to *stake off* your claim; if on a lode or gulch, a stake at each end of your claim; if patch or hill diggings, one at each corner, stating on your stakes what you claim, and recording with the recorder of the district a certificate of your claim. The effect of such a record has been at different times and in different districts so various it would be impossibe for me to specify, but in all instances gave a person the right to possession and enjoyment under restrictions specified by law. Generally a person was entitled on a lode to 100 feet in length of the vein he discovered, or on which he pre-empted, after some one else had made the discovery, together with 50 feet of surface, in width, for working the same.

17. That would depend upon the district law, but I never knew of its being done.

18. The legislature of this State provided for these records of the various districts to be deposited with the county recorder. In one case I had these books were tampered with, and I proceeded the same as a person would to prove that a conveyance or any other paper had been tampered with. I do not think, however, that there is any, or at least very little, property held under the district laws or records in this State.

19. I think it is much the best and most convenient way for the initiatory to be taken, as it now is, with the county clerks or recorders. Inasmuch as the recorders keep the records of all instruments requiring record (even recording the patent after it issued by the general government), why not let them keep these also? The county office is of course more convenient in most every instance, and as the recorders are elected by the people, and mostly by men who personally know them, it is a rare thing to have a poor or unaccommodating one.

20. I think not. I am well pleased with the workings of that phase of the law. I could give more reasons than I could find paper to write upon why mining litigation should not go before the land offices.

21. I would retain much of the present law, but I would make a distinction between veins or lodes in the primary formation and all others. I would allow a person to pre-empt, as now, say, 800 or 1,000 feet on a fissure vein which he has discovered, and hold it absolutely, no difference where it went, and sufficient surface for the proper working of the same, say 100 feet wide and *nothing more*. I would not throw in spurs, parallel, cross-veins, &c. On all other kind of veins, deposits, &c., I would confine him to certain boundaries. It is a distinction easily made, and a law framed for one kind of vein or lode is not applicable to the other.

22. Under the present law a person must perform $100 worth of work a year to hold his claim, and I think it is better for the country as it is than to force him to obtain a patent, which you could not very well do anyhow, as he would probably get a friend to hold it for him.

Yours,

HENRY NEIKIRK.

Suggestions to the Public Land Commission by H. K. Pinckney, Pueblo, Colo.

UNITED STATES LAND OFFICE,
Pueblo, Colo., August 22, 1879.

DEAR SIR: Referring to your recent request, and in which you ask me to offer any suggestions I may deem proper in response to circular from the Public Land Commission of the Interior Department, I will say as follows:

As you are aware, from your long residence in Colorado and from your experience as

register of a land office, Southern Colorado, with the exception of a small area of farming lands, is devoted almost exclusively to pastoral purposes. The area of this district in acres aggregates about 15,000,000, a great portion of which is yet unsurveyed.

It is no uncommon thing, as you can testify, for stockmen to enter with scrip, and under the homestead and pre-emption laws, several springs and water-holes, and by so doing control great bodies of land, to the exclusion of others, for the reason that without the water the grazing lands for miles are worthless to any one.

There are instances where stockmen for the better protection of their stock have fenced in portions of the public domain.

To remedy this evil and cause a source of additional revenue to the government, these lands should be assessed at what they are really worth, and sold to stockmen and others at their assessed value. It would result in the sale of the greater portion of our arid lands. It would also in a great measure prevent the unfortunate dissensions which now exist between the cattle and sheep men of this country; for if these lands can be purchased at what they are really worth, all of our stockmen and farmers could and would own their own ranges, and not infringe on one another's rights as is now frequently the case.

Another and greater impending evil would be done away with, viz: the practice by stockmen of procuring their herders to pre-empt places and thereafter securing deeds from them. This act is virtually in direct violation of section 5392 of the United States Revised Statutes. You are aware also that the improvements usually made to secure watering places for stock are of a very inferior character, hardly sufficient to hold the land, and, although residence is essential under the law, the business in which these men are engaged is of such a nature that a full compliance with the law so far as residence is concerned is impossible. That stock-raisers must have a range for their stock is patent; that very few men will live on a stock-claim the prescribed period is a fact, and that they will in time use other methods of obtaining titles to the public lands is a natural sequence. I believe that the offering for sale and grading of the arid lands is a long-felt necessity for the protection of the interests of our settlers; it will be a source of revenue to the government; it will prevent the crime of perjury on the part of pre-emptors, and result in improvements in the way of fencing and irrigation alike beneficial to the State and country at large.

I have heard it remarked that a lease of the public lands by the government in tracts of 1,000 to 10,000 acres for ten years would be desirable, but from conversations had with settlers in this section it is evident that they would much rather purchase the lands outright, as the rental in ten years would cost more than the land, to say nothing of the hard feelings that might be engendered by a lease to other parties for a greater consideration after the expiration of such lease. It might be a greater source of revenue to the government, but that is a minor consideration when compared to the peace and prosperity of a community.

I would like very much to make some statements concerning the Fort Reynolds military reservation, the Las Animas grant, and the "mineral belt" of this district, and will at any time you may desire.

Very respectfully,

H. K. PINCKNEY.

Hon. GEORGE M. CHILCOTT,
Pueblo, Colo.

PUEBLO, COLO., *August* 23, 1879.

GENTLEMEN: I would respectfully recommend that the suggestions made by Mr. Pinckney receive your careful attention, and when you arrive here for trip proposed by the stockgrowers' association, I shall be glad to accompany you as one of its members.

Respectfully,

G. M. CHILCOTT.

Testimony of W. H. F. Randall, attorney-at-law, Leadville, Colo.

W. H. F. RANDALL, of Leadville, Colo., lawyer in practice, testifies:

I think the present mining law should be amended so as to apply to all mineral land—a general law—and that the present law tends to vexatious litigation; and would suggest the enactment of a law that the claimant be confined to a square location, with side and end lines defined, beyond which the locator or owner could not go. The party who enters upon a claim should be protected while he is prospecting it and before he strikes the ledge. I suggest that a general, sweeping law be passed, providing for the United States retaining possession of mineral lands as it does of agricult

ural and other classes up and to the time of patent, and that the register and receiver in land districts receive the filings of mine locators, either in person or by deputy, as is now done by local recorders under State law, thus preventing fraud in alteration of dates of filing claims, &c.; and that the present law should be amended so that the difference between a placer or lode claim or mine be defined clearly and beyond doubt, and that "apex of a lode" be expressly defined. One source of trouble at present in the surveying of the public lands is the fact that the deputy surveyors return as mineral much land which upon contest (an expense to claimant) proves to be agricultural. This results from there being no regulation or method of defining the kinds or qualities of lands, and the fact that the deputy surveyors in general are not scientific men and so cannot return true character of the lands. Frequently surveyors, because lands lie within range of mineral lands on the plats so mark all of them. The timber on the public land should be protected by law from waste and destruction, and the power to enforce this law should be placed in the hands of the register and receiver of the different land districts. At the present rate of destruction in the vicinity of this district there will be none left in a year and a half. The present mixed condition of mining legislation leads to almost endless litigation. Scarcely a valuable mine in this locality but what has been put to heavy expense and damages by reason of jumpers and adverse claimants for blackmailing purposes.

Testimony of H. W. Reed, United States deputy mineral surveyor, Ouray, Colo.

The questions to which the following answers are given will be found on sheet facing page 1:

To the Public Land Commission:

GENTLEMEN: I have received your circular and have time to answer but briefly. I am a United States deputy mineral surveyor, and reside at Ouray, Colo.; I have lived here since the summer of 1875.

In this county the greater part of the public lands is in the mountains. We have some agricultural land in the valleys and good grazing land on the mesas.

The distance from the valleys to the highest mountains in this county is so short that no general description can be given and no general answer to the question as to rainfall, fall of snow, &c. The rainy season is in the months of July and August. I have little acquaintance with the agricultural interest.

TIMBER.

In the mining districts the timber is spruce. There seems to be no law under which parties can obtain title to timber land in a mineral country. In the neighborhood of every mining camp there are many square miles of timber that parties would willingly pay a fair price for if offered for sale by the government. A law authorizing the sale of timber land in a mineral country is greatly needed. Where there are any mineral claims they could be exempted or the timber could be sold without giving title to the land. There is so little timber in the neighborhood of many camps that it would not be just to sell the timber in very large tracts; twenty to sixty acres in a tract would be sufficient. Miners at present have to cut timber off of the public lands or stop work on the mines. A large per cent. of the timber in this county has been destroyed this year by fire. In many instances the fires have been willfully set by the Indians.

LODE CLAIMS.

1. I have had five years' experience in this country in mining and mine surveying.

2. The principal defects in the mining laws that I have noticed are as to what rights a claimant has to whatever is within the boundary lines of his claim. The law gives to the oldest locator the right to the ore at the intersection of two claims (where two claims cross, say, at right angles). It should be more explicitly stated whether this means the intersection of the *veins* or the intersection of the surface boundaries. The veins are often but two or three feet wide, while the surface claimed is three hundred.

4. The top or apex is generally understood to be that part of the lode that is first discovered. A vertical lode has its apex at the surface. As applied to a horizontal lode the word apex is a misnomer and leads to endless trouble or litigation, for the law gives a claimant the right to follow the lode outside of his boundary lines; and if the lode is horizontal or nearly so, the prior locator controls an endless tract of land, and other *bona-fide* locators have no means of knowing what their rights are.

5. It is often impossible to ascertain the direction of a vein until it has been extensively worked.

9. The outcrop of lodes is often wider than the legal width of the claims as limited by local laws. The United States allow 600 feet in width, which is more than ample.

11. I do not understand that the law allows the location of a bogus lode. If it did it would work a positive injury to a *bona-fide* locator and would discourage legitimate prospecting. The law should be very plain and clear upon this point.

12. It is always possible to make litigation, but I do not think B could acquire any rights over A. I never heard of any one succeeding in such a contest.

13. The discovery of a rich vein is almost always followed by litigation, because the law does not clearly define how a man's rights are limited or protected by his side lines.

14. It is necessary to allow miners to follow their vein on the dip in most cases, or a mine would have to be abandoned in most cases when a depth of 1,000 feet was reached.

15, 19. But little attention is paid to miners' laws here. It would be a nuisance to have the initiation of record title placed with United States officers. To say nothing of the hardship of being obliged to travel a hundred miles across the mountains in winter to go to a United States land office, it is manifest to any one that the proper place to initiate title is where all subsequent transfers have to be recorded—*i. e.*, in the office of the county recorder.

16, 17. Lodes in this district are located in accordance with United States laws, except that in most cases the direction of the lode is given in a very vague manner and its *locus* is not fixed with accuracy. The State law provides for the filing of an additional location certificate, which cures these defects without destroying any rights acquired under the previous locations.

18. All of our records of mining titles are made in the office of the county clerk and recorder, and a case of fraud in keeping the records is as rare as in any of the Eastern States.

20. It would certainly be well to leave the settlement of adverse claims to the register of the land office or other land officer, if care were taken to appoint able judges of law to those positions. Under the present practice of appointment, miners would have their rights better protected in a court of law. There is quite a difference between deciding a dispute between two farmers as to their rights to a bit of unimproved land worth a few hundred dollars and deciding a mining claim that may involve a million.

21. The only amendments that I would suggest to the existing laws are: 1st. That a claimant should have exclusive right to all the mineral of all lodes inside of his boundary lines. This would give him the ownership of all cross-lodes inside of his lines. But he should not be allowed to interfere with another claim that comes in on the dip. This may be the intention of the present law, but as it stands it does not state clearly whether the ownership of all the mineral belongs to the prior locator or only that part that lies at the intersection of the veins. In other words, it does not state clearly any difference between the vein and the claim.

22. I think that after holding a claim for five years a claimant should be obliged to patent. To obtain the duplicate receipt for a patent from the local land office requires from four to five months, and another year to obtain the patent from Washington.

I haven't time to answer in detail all the questions that you ask in an extended manner.

I hope what I have said may be of some slight use.

Respectfully,

H. W. REED,
Ouray, Colo.

SEPTEMBER 29, 1879

Testimony of R. A. Southworth, stock breeder and farmer, near Denver, Colo.

The questions to which the following answers are given will be found on sheet facing page 1:

OFFICE OF PLEASANT VIEW STOCK FARM,
Denver, Colo., November 3, 1879.

Public Land Commission:

GENTLEMEN: Inclosed please find answers to such of your questions as come under my knowledge and observation. Said answers, so far as relates to disposal of lands, give what seems to me to be the best means or way for government to adopt, providing Congress deems it best for government to retain control of said lands until sold

But it seems to me that the arid lands of Colorado should be given to her, and the money derived from the sale to be devoted to distributing the water that now flows through her different streams to the Gulf of Mexico, doing no one good, over said lands so far as it may go, to make them fruitful, as there is no better producing soil in the world than this when once under water and properly irrigated. By storing the water in lakes, ponds, and reservoirs when not needed for irrigation, it would convert large quantities of desert lands into fruitful farms. The undertaking is too large for private enterprise. The mining interest of Colorado will never be fully developed until her agricultural interests are.

Yours, truly,

R. A. SOUTHWORTH.

1. R. A. Southworth, near Denver, Colo.; occupation, stock breeder and farmer.
2. About five years.
3. Yes; by pre-emption and by timber-culture act.
4. By observation among acquaintances and neighbors.
5. It will cost me to procure a patent for my "timber culture," by a full compliance with law, $5,000 to get the water necessary to irrigate with, aside from the labor and expense of planting and cultivating the timber. Under pre-emption or timber claim it is impossible for any one to procure a title to the land who is dependent upon what he can raise from the soil to procure and pay for the same without means to construct a ditch to irrigate the same, and fully nine-tenths of the land cannot be irrigated for lack of water.
6. Yes. Cannot get title to a large proportion of United States lands in this State under existing laws. Timber and pre-emption claims, lack of water, homesteads law does not give land enough to make a living on at stock raising. If taken by homestead, government should give larger tracts; if by purchase, lower price.
7. Most of the lands here are fit for pasturage only; a little can be yet watered at great expense.
8. General rule.
10. Should be sold to those who desire to purchase at from 10 to 25 cents per acre or given in homesteads of 2,000 acres.

AGRICULTURE.

1. Climate healthful; rainfall slight; snowfall light also, except in the mountains. Water for irrigation is supplied by melting snow in the mountains; is not sufficient to irrigate one-fourth of the land of the State.
2. Rainfall occurs in the spring, April and May mostly, some years a little in June and July. The greatest water supply comes when most needed.
3. What proportion can be cultivated without irrigation? None.
4. With irrigation? Immediate vicinity, nearly all, with here and there an exception, ridges too high to get water on and others too rough and broken, say four-fifths.
5. Wheat, oats, barley, corn, rye, potatoes, in fact every kind of grain and cereals that are raised in this latitude east of us.
6. To irrigate 100 acres of wheat will take 75 inches of water.
7. Water comes from the mountains through the various streams, and is supplied by melting snow and springs. One-half of the waters have been appropriated, or thereabouts.
8. Do not think irrigation any detriment to the soil, on the contrary a help when properly done; in proof can show land near here that has grown a crop of wheat each year for eighteen years in succession and produced an average of nearly 25 bushels.
9. Three-fourths of the water in ditches is exhausted in the season; one-fourth of the water is returned to the streams as waste water voluntarily. Farmers, where not owning an interest in a ditch, buy water by the inch or by the acre.
10. Should judge one-half of the water of the State has been appropriated; oldest ditch has priority of right under State constitution laws.
11. Conflicts as to priority are the only ones so far as I know.
12. At least three-fourths, should judge.
13. It is practicable to establish homesteads on these lands, or the greater portion of them; should say 2,000 acres.
14. Yes, and should be limited.
15. Twenty acres are required to raise one head of beef. About the same on an average. There are localities where much less would do, and others where an animal would starve on 100 acres.
16. One hundred head of cattle to the family.
17 Twenty to twenty-five head to square mile.
18 Grass not so good fed shorter.
19. Cattle-raisers to some extent fence ranges, or a portion. It will be done more in the future.

20. Quality of herds would be improved by this practice to a great extent.
21. Rivers, creeks, and springs.
22. Five sheep are equivalent to one beef.
23. It has generally diminished.
24. Cattle and sheep will not graze profitably on the same ground.
25. Conflicts arise from sheep coming on to ranges already occupied by cattle men, for the reason that sheep eat the grass so close that the cattle cannot get a bite after them.
26 and 27. Not answered.
28. Cannot find a good many of the corners without surveying the ground.

Yours, truly,

R. A. SOUTHWORTH,
Denver.

Testimony of Mr. Stevens relative to public-land laws and surveys in Colorado and other places.

(*Vide* question 3.) Answer. There is no propriety whatever; it is the most absurd rule or practice that can be adopted by local laws. There is no legislation which prevents the practice being put in force, however, as the miners can so locate their claims, and the rules adopted by them are likely to prevail; that is, the State laws recognize the miners' rules so long as they do not interfere with existing State legislation.

(*Vide* question 4.) Answer. That portion of the vein which outcrops within the walls of the rock in place, or, in other words, the highest point in the highest line of the lode, is the apex. It cannot without absolute exploration; so that it may safely be said that it would cost fully $1,000 to determine the line of direction at the outcrop.

(*Vide* question 5.) Answer. They are not.

(*Vide* question 6.) Answer. A large preponderance—perhaps 90 per cent.—of mining litigation has sprung up in cases of parties who were unable to define the line of direction of their lode and cover it with their title. The government law allows 600 feet as the end width of the line of the lode; the local laws and the State laws limit the end width of the lode to 300 feet in some counties; while in other counties they allow even less. An end width of 300 feet is equivalent to 150 feet on either side of the center of the lode. In Gilpin, Clear Creek, and Boulder Counties the end width of the lode is limited to 150 feet; that is, to 75 feet on each side. Park, Lake, and the southern counties of this State allow an end width of 300 feet; that is, 150 feet on each side.

(*Vide* question 7.) Answer. I have.

(*Vide* question 8.) Answer. I have.

(*Vide* question 9.) Answer. They are frequently; that is, the outcrops of the lodes, which are strictly essential portions of their respective lodes and are so considered by the law as defined in repeated decisions, are often more extensive in width than the limit which the law allows for a claim even if the extreme width of 600 feet be taken.

(*Vide* question 10.) Answer. They do.

(*Vide* question 11.) Answer. To their disadvantage; in more than a hundred instances to my personal knowledge. There is no mine which I value, to my knowledge, within the limits of the State of Colorado that has not been involved in litigation in consequence of that very circumstance, where adjacent lands were worthless for mineral purposes but could be made use of by a jumper to sink a shaft down to a lode already developed and then prevent its further development; the only remedy is a costly litigation.

(*Vide* question 11.) Cross-question. Have such instances occurred in this section?—Answer. Yes; more than ten times which I could name in this district.

Cross-question. Can you roughly state the amount of money which has been wasted in litigation growing out of this practice?—Answer. I should hardly venture to make even a rough estimate of the total amount. In my own case I may say that I have spent from fifty to seventy-five thousand dollars to protect our lands against jumpers who have located on lands too which have been proved again and again to be entirely worthless as mining lands. I mean that the lands were worthless except to a jumper who could use them to cut our vein of ore and thus secure a mining title.

(*Vide* question 12.) Answer. He can; and his position will be sustained in the local courts and also in the federal courts. The case mentioned has actually occurred several times in this State, and the decisions in favor of the subsequent locator have been rendered by the highest authority, the judges of the supreme court, Hallett and Miller.

(*Vide* question 13.) Answer. They are; it is—the pretense is—that the claim which you own is bounded within your patented side and end lines. The land about you being public domain is therefore open for occupation, and every citizen and every man who has declared his intention of becoming a citizen has a right to come outside of your side lines and sink a shaft. He cannot touch your lode, but he claims to have struck a parallel and overlapping one, and the determination of this point generally occasions a costly lawsuit.

Cross-question. Would it or would it not be wise, in your judgment, to exact of every locator affirmative proof that he has really struck a new lode? Answer. I would make him prove it by his own affidavit and by two disinterested witnesses who should show that he had made an actual discovery.

Cross-question. In other words, would you exact of every applicant proof sufficient to show that he had discovered actual mineral and did not seek merely a chance to blackmail his neighbor?

(*Vide* question 13.) Answer. Question 2 (cross). The man should make and prove an actual discovery within the meaning of the law.

ADDENDA.—(Answer by Mr. Robinson.) In my opinion, some responsible public officer should be the person to determine the accuracy of the applicant's claim. The certificate of such an officer is required by the old Spanish domain law. We want an officer whom the government can hold responsible to make the examination and report.

(*Vide* question 14.) Answer. It is scarcely possible; locators can scarcely do so without provoking litigation.

Cross-question. Could you suggest a practical form in which this provision might be retained? Answer. Such a form might be devised, but I do not believe that the people in the mineral regions would ever understand it and abide by it; it would be a failure in so far as stopping litigation is concerned.

(NOTE 1.) Mr. Stevens said: "I am clearly of the opinion that Congress has delegated powers to the Terri torial and State legislatures which they should never have been allowed to exercise. By reason of this delegated authority, these legislatures have been able to interfere constantly with the disposition of the public domain. In my opinion, Congress should enact such laws as would enable it to resume full control of the public domain."

(NOTE 2.) Mr. Stevens said in relation to the status of the mining laws in the States lying to the west and northwest of the great lakes: "In Michigan only one case has been carried to the Supreme Court in the past twenty-five years where the question of title to mining lands was raised. This was a contest between the Minnesota and the National Mining Companies. The National Company held their title from a grant made by the State of Michigan under the provisions of the school act. The Minnesota Company derived their title under an old land law permitting location and pre-emption by authority of the War Department. (This law was passed on the 3d of March, 1843.) The Supreme Court ruled that the school land was held by the State of Michigan. The action of the War Department in leasing the land to the Minnesota Mining Company was held to be legal by the Attorney-General in his written opinion. At the time that the land grant of the school sections was made by the State of Michigan to the National Mining Company the government held that the grant made by the State under their title to every sixteenth section of land was valid. The Minnesota Mining Company claimed that portion of the school section land which they had pre-empted and surveyed under the grant made by the War Department. The government mineral lands were pre-empted or leased under surveys made by Allison. Judge Burt was appointed to carry the meridian lines through the disputed district. Then a law was passed declaring that the lands nearest the subdivisions should be considered as the lands which were sold by the War Department to the Minnesota Mining Company. Where the lines as surveyed by Allison differed from the later survey lines the holders of the land were allowed to adjust them to the subdivision lines."

NOTE.—ADDENDA.—"The operation of the mineral land laws in Michigan was substantially the same as their operation in Wisconsin, Minnesota, Illinois; in fact, in all the northwestern States lying near the great lakes."

Question A. What is the average expense of procuring a title to a lot?—Answer. We seldom get a lot for less than $150. Under existing laws, however, I should not recommend any effort to reduce the expense of procuring a title to a lot. It is one of our imperfect safeguards against jumpers who annoy us by taking possession of neighboring lots. If the lot next our productive one is barren, the jumper must pay a considerable sum for a worthless plot of ground, with the chance also of being worsted in his litigation for our productive lode. I would, therefore, increase the price of lots to obviate the chance somewhat that a worthless lot may be taken on speculation.

NOTE.—In regard to amendments of existing legislation, Mr. Stevens said: "I would recommend that all surveys in future should be made by the United States Government, in accordance with their recognized system of establishing meridians and base lines, and then that rectangular lots should be laid off. I would limit all sales of government lands in future to lands whose boundaries have been accurately determined by government surveys."

NOTE.—(Question to be added.) "What resource is there for a mine-holder except forcible resistance, if a jumper obtains part possession of his land by fraud and the unjust operation of the local mining laws?"

Testimony of Eugene K. Stienson, practical surveyor, Denver, Colo.

EUGENE K. STIENSON, practical surveyor, testified at Pueblo, Colo., August 29, 1879:

Reside at Denver, Colo. I have had contracts under the surveyor-general of Colorado for surveying the public lands. I think the present rectangular system of surveying the public lands good, and it should be retained. Its simplicity recommends it to all. The present methods of executing the surveys are inaccurate. This results from the employment of incompetent people, and careless and injudicious acts on the part of competent people. I think that a stone monument at the intersection of, say, four townships, when the ground is hard, or a metal or other lasting stake at the same place where the ground is soft, would be the best method to perpetuate the surveys, or the New York method of "pots and charcoal," or to tie these monuments to some natural fixed object. I have frequently made surveys for private parties, settlers on the plains. I have found most all the stakes and posts gone, and have been compelled to take the field-notes of the surveyor-general and relocate the tract and place new corners. The present price per mile for surveying the prairie townships is now too low. The government at present pays $10 per mile for mountains and $6 for prairie or subdivision lines. A surveyor in the field has his party on hand and so hurries through his work and slouches it, so as to make money out of the contract. I have had experience in surveying mineral lands, and I think a square location with end and side lines should be adopted.

One-half of the deputy United States mineral surveyors don't know how to use the instruments requisite to do this work correctly. The present method of appointment of deputy United States mineral surveyors is bad. At present a person desiring to have such an appointment gets the recommendation of three or four prominent politicians and then is appointed. No particular attention is paid to his qualifications. I was on the surveys for both roads, the Atchison, Topeka and Santa Fé Railroad and Denver and Rio Grande Railroad surveys of the Grand Cañon of the Arkansas in this land district, where the Denver and Rio Grande ran a line through the cañon to the exclusion of all other corporations. My judgment is that no single railroad company should have the right to solely occupy such a natural pass. It should be common to all, or if only room for one, then all should use the track with compensation for the use to the company building it. The present law that when a deputy surveyor makes a mistake in the location of a corner that it is final and shall stand, even though an error, should be repealed and the surveyor-general have the right to order its correction. I recall an error of a deputy in surveying a township; in chaining made an error of 700 feet in one mile.

Testimony of James B. Thompson, special agent Interior Department, Leadville, Colo.

JAMES B. THOMPSON, special agent Interior Department on timber depredations, testifies:

I reside in Denver, and have been a resident of Colorado for ten years. I am special agent of the General Land Office, and my duties are to investigate and report upon timber depredations on the public lands, and have acted as such since June 26, 1879.

In answer to the inquiry what depredations I have observed in this locality I have to state that a very large proportion of the timber of this vicinity has already been cut in violation of law, and the destruction of timber is very rapidly progressing. There are seventeen saw-mills at work, which will cut 5,000 feet on an average for each mill daily. There are fourteen smelting works, which consume charcoal made in the vicinity to the extent of nearly 40,000 bushels daily, equivalent to 1,200 cords of wood. I think that about 300 men are engaged in supplying charcoal, and these employ probably more than 2,000 choppers, haulers, and burners. The smelters co-operate with the charcoal men, and often build kilns for them. Large quantities of timber are also taken for timbering mines, the amount of which is extremely difficult to estimate.

Not only is timber taken for the necessary purposes of mining and building, but there is no doubt much waste. Fire is in some cases purposely set to the forests in order to kill the standing timber. Wood which is dead though still sound is considered best for making charcoal, and killing the trees by fire is believed to bring the wood into the best condition for charring. In other cases, young trees are selected as yielding better charcoal than older ones, while the older trees are taken for lumber. In cutting trees, therefore, the whole tract is denuded and left bare. Large quantities of timber are cut down and left lying on the ground.

The difficulty arises from the fact that there is no lawful way in which a person can acquire title to timber-land, be protected in his rights, and have a personal interest in preserving timber and using it economically. There is no doubt that if persons could

acquire such titles they would gladly do so, and pay a fair price for the land. All the land in this vicinity, with the exception of small tracts along the Arkansas, has been declared mineral land, and can be acquired only as such. I have reason to believe that numerous tracts have been taken up, both as placer and lode claims, for the purpose of securing the timber on them. They have merely been filed upon without the intention of perfecting titles, but merely to hold them long enough to strip off the timber. None of the *bona-fide* mining companies have ever done this to my knowledge. Where a number of them have consolidated they have merely claimed the right to hold the timber for their own purposes.

In answer to the inquiry about destruction by fire, I may say that they originate in many ways. I think that most of them originate from carelessness in leaving campfires in the morning. The wind rising toward midday scatters the embers and sets fire to thousands of acres. In some portions of the State Indians set fire to the forests, partly to drive game, partly to destroy the old dead grass and give the young grass a better chance to grow. I have been a frequent witness of this, and also a sufferer by it. Under the State laws Indians are liable to punishment for setting fires the same as whites.

The effects upon the general welfare of the country I conceive to be mainly of two kinds. In the first place, the destruction of forests is proceeding far more rapidly than their restoration by growth. The amount of standing timber in the State has largely and very visibly decreased during the last ten years, and before many years have passed the State will be disforested unless the present tendency is checked. The second effect is very serious. The great accumulations of snow, which by its melting feeds the streams, are at those altitudes where timber grows most abundantly. During the early summer the forests by their shade retard the melting of the snow, and the streams are fed gradually and slowly and usually keep up a good flow of water throughout the summer. Where the forests are stripped off or burned the snow rapidly melts in early summer, the water runs off in large volume, and then the streams dry up. Streams which now yield a good body of water for irrigation throughout the summer and pasturage in the lower altitudes would suddenly become dry or so much depleted as to be practically useless for irrigating purposes.

The forests are heavier usually upon the western mountain slopes than upon the eastern. The fires also are more destructive on the western slopes, partly because there is more wood to feed them and partly because of the prevalent west winds.

In answer to the inquiry what has been my experience and the results of my efforts in carrying out the instructions of the Interior Department, I may say that I have found the owners of saw-mills and timber-cutters very indifferent and regardless of the possible consequences of their depredations either to themselves or to the community. While they profess themselves desirous of acquiring rights to timber, they seem to look upon it at present as a kind of spoil sanctioned to them by local practice and have little fear of prosecution. They have apparently the conviction that even if prosecuted they will not be convicted, because the local sentiment is entirely favorable to them and no jury would convict them. Personally I have nothing to complain of, having always received civil treatment and found them willing to discuss the subject. But they evidently feel secure against any legal consequences and rather despise the law; They argue, and justly, that timber is an absolute necessity, and it is undoubtedly true that the greater part of what has been taken has been put to the most necessary uses. in a word, the taking of this timber is regarded by them as one of those "necessities which know no law." They are undoubtedly sustained by public sentiment.

In presenting to these parties the terms of compromise which the Interior Department has offered I have met with little response. I have sent notices to about fifty different parties and have received acknowledgments from only four. The last one to acknowledge it was the most extensive depredator in the camp. He called upon me recently and stated that he would confer with others in the same occupation. If they agreed to compromise he would join with them, but if they determined to abide a lawsuit he should do whatever they did.

I have not brought suit against any of these parties, partly because I have not felt authorized to do so, and partly because I think that no means should be omitted to induce these parties to accept the terms offered by the Interior Department. I think, however, that such acceptance begins to look almost hopeless and that a suit ought to be brought after waiting a reasonable time. Even if the suit fails it will have the advantage of showing the weakness of the law and its practical nullity.

In answer to the question what remedy I would suggest, it seems to me that some law should be passed enabling claimants to obtain directly from the government titles to forest or timber land in much the same manner as farms and placers are obtained, and solely for the timber upon it. In the mean time, pending the passage of such a law, it seems to me that the Secretary of the Interior should make a rule allowing the cutting of timber under the supervision of a proper officer, who should have the power to designate what trees should be cut, and to collect a stumpage tax for all trees taken. I think the general principle which should be recognized both in legislative and ex-

ecutive action is this: that the timber-cutters are willing to submit to reasonable limitations and restrictions in taking timber, and are also willing to pay for the privilege a reasonable price, but that any attempt to enforce a sweeping prohibition would be futile. It could not be done here without a large armed force. The rule of the Secretary for the protection of young trees is an excellent one in principle, but unfortunately it is overborne and rendered a nullity because the present system of which it is a part is defective as a whole, and it fails because the system fails. I think that the Secretary should issue the rule I have suggested at once, as the timber is disappearing in numerous localities at a very rapid rate.

In answer to the question whether it would be practicable for the government to enforce restrictions while allowing a limited use of timber, I would say yes. I think the people of the State are sufficiently intelligent to understand the necessity of such restrictions to the future welfare and prosperity of the State, and sufficiently law-abiding to submit to them if reasonable. I think that they will not be slow to understand the ruinous effect of disforesting the country, or to understand that persons who take timber should have some show of authority for it, and should in equity be compelled to pay for the privilege and be protected in their privilege when they have paid for it.

In case timber lands were sold by the government the size of the tracts is perhaps a matter of no grave importance. If they could be sold those parties who wanted large lots would ultimately get them, however small might be the original parcels patented by the government.

I think that so long as the government owns timber land it should be under the supervision of government officers. I believe that this would be more satisfactory to the people than the absence of all supervision. As a rule I think people would rather get their timber honestly and in a lawful way from the responsible agents of the party which holds it than steal it. Such a supervising officer should have powers, and decided powers, to meet the want for timber on the one hand and to protect the rights of the government on the other. Such powers are not possessed by the present agents. At present the position of such an agent is merely that of a suppliant to men who, whatever may be the extenuation, are both technically and really violators of law. The expense of such officers would be more than repaid to the government, for under their supervision the timber could be sold and bring revenue over and above their salaries, whereas at present the government loses its timber and gets nothing except abuse and defiance from depredators.

Testimony of W. B. Vickers, private secretary executive department, Colorado.

STATE OF COLORADO, EXECUTIVE DEPARTMENT,
Denver, September 19, 1879.

Public Land Commission:

GENTLEMEN: Among the questions which you suggest to the citizens of Colorado are one or two which interest me, and upon which I have some "views" and a little information. Acting as secretary of the State board of land commissioners for some time past, I have been brought in contact with a number of our leading agriculturists and stockmen, and have been enabled to judge somewhat how they view the various plans proposed for disposing of the public lands of Colorado now lying waste by reason of aridity. Admitting for the most part that the general government ought to receive some income either from the sale or lease of its land in Colorado, I cannot see how any permanent benefit can be derived from any disposition of these lands other than the present system. It is true that thousands of acres now lie waste, except in the important sense that they furnish grazing ground for thousands of cattle and sheep, which are adding every year a large total to the taxable wealth of Colorado and the country. But this range is valuable only because it is open. It is because cattle and sheep can roam at will over these broad plains from north to south and from east to west that they can be raised and marketed with profit. To fence a range is to destroy its value, unless the tract inclosed is much larger than most stockmen could afford to fence, even if the land itself cost them nothing.

Perhaps this fact, even if admitted, is no argument in favor of furnishing stock-growers a free pasture at the expense of the government, while agriculturists must buy the land they occupy; but what better can be done? The great plains are singularly valueless for any other purpose. Lack of water will prevent the reclamation of any considerable portion of them for the uses of husbandmen, but such portions as shall be reclaimed will, under the present system, eventually bring its value in the open market. The remainder might bring from 10 to 25 cents per acre if sold in unlimited quantities to cattle kings, who could buy up whole counties. But the smaller

operators could do nothing. Even the poor privilege of herding a few head of cattle or small flocks of sheep would be denied them.

To confine stock in a small inclosure, say 2,500 acres, is to invite destruction or compel winter feeding, which amounts to the same thing. No winter would ever pass without seeing the inclosed land covered deep with snow, and if the stock could not wander in search of grass elsewhere, it must be fed or die. If the water supply should fail within the inclosure, the result would be equivalent.

Under the existing law much of this land comes into market annually as a consequence of the demand for water privileges by small stockmen, and the quantity will increase until the valleys of all living streams will be taken up. Coupled with the sale of lands reclaimed for agriculture, this will constitute a revenue with which the government should be satisfied. The *cash* value of the arid lands of Colorado is infinitely less than that of the swamp lands ceded to the older States, and yet these arid lands are yielding a continual revenue, directly and indirectly. Unless the lands can be ceded to the State, I would suggest no change in the manner of their disposal.

Respectfully, your obedient servant,

W. B. VICKERS,
Private Secretary.

Testimony of A. S. Weston, attorney-at-law, Leadville, Colo., relative to mining laws.

A. S. WESTON, practicing attorney, Leadville, Colo., testifies:

The mining law at present requires that the applicant, in person, shall make proof of the fact that the plat of the claim and notice of intention to apply have remained posted on the claim for sixty days, or practically seventy, ten publications in a newspaper being required. The applicant may live in New York or in San Francisco, so at immense expense he must appear at the district office to show the above. The law should be so amended as to permit this to be done by any competent witness. Two brothers, living here, located a claim. Neither one lived on the claim more than thirty days each, so neither was a competent witness to the sixty days' posting above set out. They gave a quitclaim deed for their possessory right, and then one went to Australia and the other to Ireland. The purchasers from them were put to a heavy expense in getting the proof from abroad—depositions of facts above set out and local proof. Now, if a competent witness, cognizant of the posting of notice above set out, had been permitted to make this proof the intention and purpose of the law would have been fully carried out, and much vexatious delay and expense been prevented.

At present, in surveys of the public lands, the deputy surveyors, owing to lack of regulation on this point of law, return on the plats entirely too much land in this district as mineral. Pre-emption or homestead settlers have the burden of proof by the existing law put upon them to show its non-mineral character—this at great expense and trouble. The notice of "final proof" now required to be published, posted, and proved by law in homestead and pre-emption proving up should be at once abolished as unnecessary and useless. I knew a case where a claimant came twice with two witnesses, at great expense, more than one hundred miles to comply with this regulation.

Testimony of F. D. Wight, Trinidad, Colo.

TRINIDAD, COLO., *September* 6, 1879.

F. D. WIGHT made the following statement:

I am a sheep raiser in Las Animas County, Colorado. I own about 10,000 sheep, which I range in Colfax County, New Mexico. I indorse the statement of Mr. Beattie, with this exception: I think he can graze a larger number of sheep in fewer acres than I can. He states that it takes 30 acres of land to graze 10 sheep. I should estimate that if there was no stock of any kind but sheep on a township of this land, that you might keep 5,000 sheep one year on it, perhaps in very fair shape, winter and summer. I would hardly wish to be limited to the last amount.

Mr. BEATTIE. When I referred to 3 acres for each sheep, I meant that it would be the minimum amount.

Mr. WIGHT. Your range, too, is 55 miles from here on the Dry Cimarron, where the pasturage is better. I think the estimate made by Mr. Romero is remarkable. It would not apply in Colorado or Colfax County, New Mexico. I do not think the raising of sheep and cattle is entirely incompatible with each other. I do not quite agree with Mr. Jones about the sheep leaving a bad smell on the ground that is offensive to

cattle; a number of cattle come down on my sheep ranch. I do not understand that.

Mr. JONES. If there had been other water around they would not have come there The water accounts for it.

Mr. WIGHT. I do not believe that 3,000 acres would amount to anything as a pasturage farm, and would not compare at all with 160 acres of agricultural land. I think you could support on good agricultural land a family of ten children easier than you could a family of one child on 3,000 acres of arid land. I would not accept of less than one-half a township as a homestead for making a living and supporting a family in preference to 160 acres of agricultural land, such as is given as a homestead in Illinois, Ohio, Iowa, &c., and even then if they were sheep I think they would have to be highly improved sheep that would shear 5 pounds of wool, and I do not think one-half of a township would support over 500 head of them. I do not think the net profits would be greater than could be realized from 160 acres of good agricultural land.

Mr. ARCHIBALD. As an illustration of the aridity of the country in which Messrs. Jones and Wight describe their ranch to be situated I will say that three men of the party of Mr. Deday, who was employed as deputy United States surveyor in running exterior lines in the eastern part of Las Animas County, got separated from the main party, and after wandering about on the prairie for three days in search of water two of them perished and their bodies were afterward found. The third man, who separated from the other two, narrowly escaped death. After wandering two whole days and part of the third day he found water 18 miles from the point where he separated from his two companions who perished. After wandering for two or three days more he found his party.

Testimony of R. L. Wootten, Trinidad, Colo.

TRINIDAD, COLO., *August* 30, 1879.

R. L. WOOTTEN, sheriff of Trinidad County, made the following statement:

I am a cattle owner in Las Animas County. I have heard what Mr. Beattie and others who preceded me said, and I fully concur with them. I think that there is no doubt that if this land was sold out to the cattle owners as people are able to buy it, it would tend to make this community permanent and quiet. I do not think this country is adapted at all to agricultural purposes. The wealth of the Territory lies in its stock.

There is a great deal of trouble on account of men going on one another's ranges by reason of overstocking. I have only a few cattle, but I should prefer to buy land for my cattle than to have other people come on my range. Then, too, if I owned the land I could have just the kind of cattle I liked. I purchased 10 head of bulls at a large price, but I found that my neighbors received more benefit from them than my cattle did. It is certainly to the interest of the country that these questions be settled as speedily as possible.

Testimony of Carl Wulsten, Rosita, Custer County, Colorado.

The questions to which the following answers are given will be found on sheet facing page 1:

ROSITA, CUSTER COUNTY, COLORADO, *November* 1879.

To the honorable the Public Land Commission, Washington, D. C., P. O. Box 585:

GENTLEMEN: Referring to your printed circular, I respectfully submit the following answers to your interrogatives.

CARL WULSTEN,
Civil and Mining Engineer and United States Deputy Mining Land Surveyor

1. My name is Carl Wulsten, Rosita, Custer County, Colorado, civil and mining engineer, practical miner and mine owner, and United States deputy mining land surveyor.
2. Ten years by the 21st of March, 1880.
3. I have sought to acquire title to the Bunker Hill mine (official survey No. 63, mining district No 5) under the law of May 10, 1872; and I am seeking to acquire title. also to the Lexington mine (official survey No. 76, mining district No. 5) under the same law.
4. None of any consequence.
5. I do not know, not having had any experiences.

6. Yes. I have seen men obtain title to agricultural lands by pre-emption who never lived upon the land. I know of parties having entered whole sections of land and obtained undisturbed titles thereto who never lived one day upon it, but most probably hired men to claim, file, and prove up, they furnishing the money to do so. I filed upon 160 acres of land, upon which I lived with my family, in 1870; filing was made in 1871, and another man filed right over me and upon the 40 acres upon which my home stood. I was too poor then to contest and had to give it up, and took a span of horses from him as a compensation for my improvements or get nothing. There is a hole in the law which is too easy for the wealthy and scarcely a protection for the poor settler. My idea is, that the proving up of actual residence ought to be made more stringent and more definite. Affidavits are had cheap, and the first filing ought to be made more evident as to actual possession and virtual rights in the premises. Proofs are not sufficient as they are required now. Rich corporations and individuals can now obtain far too easy parts of the public domain. Actual home and settlement ought to be the only condition of obtaining title.

7. The conformation of Custer County is mountainous, with high plateaus of grazing lands, well-watered meadow vales, and heavily timbered mountains. About one-tenth part is agricultural, three-tenths pastoral, and six-tenths timbered mineral lands.

8. Agricultural lands should be all such lands which are, first, under natural irrigation, by reference of its being below the water-courses of the mountains in level; in other words, lands which are moist enough for self-irrigation; secondly, all such mesa or bluff lands which can be irrigated by means of open irrigation ditches and not too high in its altitude above sea level as to be beyond the limits of the produce of small grains or tubers, altitudinally considered. Grazing lands ought to be considered all lands which cannot be irrigated at all, not being timber land. Timber lands ought to be considered all such lands which grow sufficient timber to be considered forests. Mineral lands ought to be considered all such lands showing transition rock, volcanic, or even plutonic formations.

9. The rectangular system of parceling surveys, as used by our government, is, in my opinion, the most practical and efficient of the world. Yet the execution of such parceling surveys is not perfect. The system of making the surveys of the public domain, by letting contracts for either surface boundaries of townships or for subdivision of such townships, is, in my estimation, wrong and the cause of an altogether imperfect result. The surveyors-general of the several States and Territories have the letting of all such survey contracts. It stands to reason that if such surveyors-general are not men of austere principles they will always have hordes of needy friends who want contracts. They may even make the letting of survey contracts a source of income themselves. It is beyond a doubt in my mind that every contract let up to date throughout the United States has been obtained through political favoritism. Politicians get these contracts for or in copartnership with land surveyors. The sureties are the partners in the contract, and the poor, needy surveyor goes out upon his contract and rushes it through in seven, eight, nine days, when twenty-one to thirty days ought to have been used for such contract; for the surveyor has to divide with his copartners or sureties, and may have to pay an assessment to even the surveyors-general. What is the consequence? The subdivisional survey is (if made *de facto* at all) made in a terrible hurry and not correct, not even *nearly* correct. I have surveyed all over this county for the last nine years. I have taken the official field-notes of townships and retraced the section, base, or range lines. In township 22 south, range 72 west (Silver Cliff), I have found but nine section corners of the interior section corners (not considering the surface boundary lines at all), and not found sixteen of them, and scarcely found any one-fourth corners at all. Now, this township was reported grazing land, when if the surveyor had made a *de-facto* survey he would have been able to find mineral in section 16 of the township. The utmost care shall be used by such surveyors, according to the instructions of the Interior Department, and so much "as to satisfy the utmost curiosity," referring to the existence of minerals, fossils, and natural curiosity. If this township 22 south, range 72 west, had been surveyed *de facto*, why the contracting surveyor would have found lots of natural curiosities in section 16, which has shown obsidian, agatized geodes, and many natural curiosities of such note as to attract even the utmost curiosity of the cowboys of the region; yet not a word of such natural curiosities, minerals, &c., appears in the official field-notes of Major Oake's contract of subdivisional survey of township 22 south, range 72 west. Why is that? I am satisfied that only those corners of this township were laid where the then just made settlement of Wet Mountain Valley might seek to build fences by and near Grape Creek. Why can I find section corners for sections 5, 6, 7, 8; for 7, 8, 17, 18; for 16, 17, 20, 21; for 17, 18, 19, 20; for 19, 20, 30, 29; for 20, 21, 28, 29; for 30, 29, 31, 32; for 28, 29, 32, 33; for 28, 27, 33, 34; and why not any others? But the township is arid lands, as reported, and the whole balance of the contract was made on paper and thus accepted. Such condition of affairs ought not to be. In other townships of this county I find miles to contain 83.58 chains, in-

stead of 80.58 chains as per official field-notes. This refers to the south base line of section 7, township 21 south, range 73 west of 105th principal meridian. On north base line of this section 7 I find 82.03¼ chains, instead of 79.20 chains as per official field-notes. Why? Because contractor never closed the last or west section run to west boundary, but just run to one-fourth, laid the same, and saved himself the other one-half miles runs. Why? Because he could not do it and exist. His contract money would not reach. He had probably to give one-half of the sum paid by the government to his copartner and surety, who obtained, through his influence with the surveyor-general, the contract, and who had probably even to pay a royalty on the obtainance to the surveyor-general. And thus I could state dozens of cases, which prove the system wrong and working detrimental to the interests of the government. My idea of the system as it ought to be adopted is: The General Land Office should have competent surveyors, who should only obtain their appointment after passing the necessary examinations in their profession for each land district, who should be salaried men and under supervision of expert superintendents, and who should only be employed for the survey of the public domain in its right-angular system, and the now existing contract system should be emphatically abolished once and forever. The competent surveyor, who has passed his government examination, should be retained in the services of the department so long as he fulfills his duties faithfully, or until his death. Thus a faithful servant is secured and the surveys of the public domains are made right and correctly. Even his surveying staff of assistants ought to be salaried men, and thus become perfectly drilled in their respective duties. These government surveyors should also be timber inspectors, whose duties it should be to watch over the preservation of the forests in their respective districts, thus insuring the preservation of our most valuable forests, making depredations upon the same almost impossible, having by means of his acquired local knowledge of his district also become perfectly acquainted with the quantity, locality, &c., of the forests, being able to at once note inroads upon the same, and enabling the prevention of destruction of them. The contracting surveyors of to-day have and take no interest in the township they survey. They rush through their contracts and vanish; do not care to report anything except their hastily constructed plats and field-notes, and do no good to the government.

AGRICULTURE.

1. The climate of Custer County is a generally moderate one. The mean temperature of May, June, July, and August, at noon of each day for eight years, was + 84 degrees Fahrenheit; of September, October, April, and March, at noon of each day for eight years, + 67.5 degrees Fahrenheit; of November, December, January, and February, at noon of each day for eight years, + 30.5 degrees Fahrenheit. (Rosita as point of observations.) The observations were made upon the south side of my house and open to the influences of the sun, but sheltered from the immediate sun rays. The hottest observation was + 91 degrees Fahrenheit, the coldest + 7 degrees Fahrenheit. The days are uniformly mild, the nights uniformly cold. The summer is dry, except during the rainy season from May to end of June and from end of July to end or middle of September. Generally the rains of May are gentle, those of July and August ferocious and emerging from terrible thunder storms. Up to December the weather is bracing and fine, when with the beginning of the new year snow storms are the rule. The average snowfalls are about 6 inches. The average moisture during the summer season is 14 inches. Custer County has but one-tenth of its area of farm lands, which are either self-irrigative or are easily irrigable by open canals.

2. Answered at 1. The most rainfall comes rather late for the crops generally; some seasons in May and June, and timely.

3. One-twentieth part of the tillable land proportion.

4. Nineteen-twentieths part of the tillable land proportion.

5. Wheat, rye, barley, oats, and potatoes.

6. Twelve cubic feet of water per minute, or 17,280 cubic feet in 24 hours, equal to 57.24 tons of water (at a velocity of 3 miles per hour), will duly irrigate 100 acres of land for wheat, oats, barley, and rye in this county; half of that amount is only necessary for potatoes.

7. Grape Creek and its tributaries in the west part of the county, Hardscrabble Creek and its tributaries in the east and northeast part.

8. The tillable subsoil of the agricultural region of this county is formed of porphyritic *débris* in the western portion of the county, and, being loose and porous, is barren if not irrigated by either rain or artificial irrigation. So soon as irrigation is resorted to it becomes very productive and strong in its results at germinative power. Irrigation does not injure the soil at all, but in every instance under my observation and experience increases fertility. On Hardscrabble the soil is made of granite and sandstone *débris*, and irrigation seems to act also very improvingly upon the soil. Wheat does ripen up to 7,500 feet; beyond that the seed has very little albumen and less starch and

will not make flour. This can also be said of rye, oats, and barley. Potatoes ripen here as high as 8,500 feet.

9. Two-thirds; two-sixteenths; one-sixteenth evaporation; voluntary generally, required by statute. (See Colorado laws.)

10. All taken up with homesteads or under pre-emption claims under the United States land laws.

11. No conflicts to my knowledge, except where some foolish men were determined to drown their crops, for fear their neighbors might receive some benefit from the water, which actually did their crops harm by overuse. Generally settled by an hour's vociferation and much gesticulation.

12. About one-thirtieth part of the county.

13. No. No man can pasture cattle, sheep, or horses except he has water, and that is taken up under pre-emption or homestead as 160 acres, and he pastures in the neighborhood of his water.

14. Yes. These lands should be limited to 160 acres.

15. Ten to fifteen acres. I do not know.

16. Ten head.

17. About 150 head.

18. It has held its own during the nine years of my residence here.

19. No. No.

20. No.

21. Springs and creeks.

22. Ten.

23. Diminished.

24. No. Cattle won't eat grass over which sheep have grazed.

25. Deadly feuds and killing of sheep by cattle men; but lately none of these quarrels have occurred.

26. About 4,000 to 5,000 sheep; about 120,000 head of cattle; sheep in herds of from 300 to 1,000. Cattle roam at large and are not herded, and are only rounded up every spring, calves branded, and unbranded cattle sold at auction, and thus the business is regulated.

27. I suggest to repeal the pre-emption law and only leave the homestead law in force.

28. Yes, in some townships there is very great trouble, as there are none to be found. I find but very, very few instances where corners are witnessed by blazed trees or rocks in place; I find no lines chopped through and blazes made to indicate where the lines have been run. I find very, very seldom the corners of such dimensions as the instructions to surveyors-general from the Commissioner of the General Land Office require; ditches and mounds I find almost none. Even township corners are not set according to these instructions, and the surveys are lamentably poor and incorrect and unconscientiously made. Cause, the contract system, in my estimation.

TIMBER.

1. One-half of the area of the county. It consists of pine, fir, larch, hemlock, scrub-oak, aspen, cottonwood, pinon-pine, cedar, wild cherry, and willow.

2. None whatever.

3. By sale at $2.50 per acre. And give a man 80 acres of timber if he will buy 80 acres of timber and clean it out and foster and cultivate it all properly. After five years, on proper evidence, give him a title to the 160 acres on paying $200 for the whole. That man by using his 160 acres of timber properly will have almost a fortune in his 160 acres of such preserved and fostered timber land in this mining region. Further, if a mine owner applies for a patent to his 10.3-acre mining claim, give him the right to apply with it for 5 acres of timber land (non-mineral) as lot 3 to his mining claim (lot 1 being his mining claim, lot 2 being his mill site, and lot 3 his timber site for mining purposes), at $2.50 per acre. Thus mine owners will foster their timber and try to preserve it for their mining purposes, and our forests will not be devastated.

4. No.

5. Yes; undergrowth of from 2 to 10 feet grows 8 inches per season of 12 months, but much becomes stunted from growing too close and smothering the more tender trees.

6. Carelessness of hunters and campers, of letting their camp-fires run out after leaving the place of the camp-fire. Indians, principally, who fire the forests to drive game out. Prevent the fires by hanging every man who can be proven to fire our forests. The people here have punished depredators, in several instances, severely. The extent of these fires has been alarming. This summer I estimate that at least 50 square miles of timber, valuable beyond estimation, has been scorched or totally destroyed by these fires in this county alone.

7. Pass a law that not a railroad tie can be cut from government land. The tie-cutters waste more timber than they use. We miners and our farmers are very careful of the

timber, as we know its value to ourselves. Prohibit all cutting of government timber, facilitate the purchase of timber lands as above stated, and have timber inspectors in every district to protect government timber.

8. They cut where they find timber they want. Whoever cuts a tree is the owner. If he does not take it away the next team loads it up and carries it off.

9. The United States district land office officials are generally too lazy to execute their office work. They would not raise a hand to protect the government's timber. Men of energy and action needed there, not political drones.

LODE CLAIMS.

1. I have had eleven years' experience in mining—in California 1849 to 1855; in Colorado 1873 to 1879—six years in mine surveying; none in mine litigation. I have surveyed over 500 location surveys, over 200 mine surveys, and some 18 official surveys for United States patents.

2. A mining (lode) claim, after being properly located, should be inviolable as to its surface boundaries. No man should be allowed to survey a cross or other claim over it. Make the surface boundaries of 1,500 by 300 feet inviolable. Give the miner the positive right to follow the dip of a vein, lode, or crevice, to the center of the earth for 1,500 feet. Make it peremptory that the right of location only begins at the actual discovery of a mineral-bearing vein in place, and give no man the location privilege if he has not discovered a *bona-fide* lode. Or abolish all this and give a man 10 acres of mineral land in a right-angular square piece of ground, and allow no other man to go inside of that square, but limit every man to ten such squares in every mining district, and make him discover mineral in paying quantities on one square before he is allowed to take up the second. Or make him put down a 50-foot shaft before he can take up another square of 10 acres of mineral land. Make him record the square at the date of his location, or thirty days, and make him put down four or eight stakes to define his boundaries, and keep him inside of his boundaries perpendicular. Make him prove up two years from location or abandon, paying $5 per acre and proving $500 worth of permanent improvements.

3. I would not allow the present official practice of filing surveys of lode claims which overlap on the surface. The Plata Verde lode claim (official survey No. 52 A), Hardscrabble mining district (mineral district No. 5), Custer County, Colorado, was a *bona-fide* location, made September 2, 1878, by William J. Robinson, surveyed and recorded. Rich mineral found and a mine worth millions uncovered. I made the official survey. The Ducktown claim was located before the location of the Plata Verde was made, but no earthly show of a speck of mineral ever was found in the hole, which they called the Ducktown, and which was in solid country rock of the commonest granite. The Ducktown was sunk 10 feet and no farther. The Plata Verde expended thousands of dollars upon development, applied for a United States patent, and at the last week of its ten weeks' advertisement is adversed by Ducktown on 1.27 acres of area in conflict. This is what I call an outrage, a blackmailing scheme of the worst kind. No; if the law was distinct in this instance this shameful practice would never prosper, and less litigations be possible.

4. Where the mineral-bearing crevice matter is first met, either on the surface or, as in blind lodes, underground, but wherever it is met, there begins the apex. No, not always. *Apices* are often shattered by slides, displaced by subsequent upheavals, or deranged by other causes, so that the dip or true course can only be ascertained by considerable sinking, drifting, and crosscutting. There should be a government mine inspector for every mining district, who should be arbiter in such cases of *apices*, &c.; whose duty it should be to see that mines are worked safely, and are not in dangerous condition to life and limb, and that they are properly ventilated, &c.

5. Yes. For a prospector has no business to locate his claim and stake his surface boundaries until he is certain of the general course of his vein, lode, or deposit.

6. No.

7. No.

8. ———

9. No. I never saw an outcrop of 300 feet yet. I do not believe there is one in existence anywhere.

10. No. Not if a man prospects the outcrop well, opens it out in several places first, before he finally locates his surface boundaries.

11. Yes. It should not be tolerated.

12. No. If A knows what he is doing and B is a just man. Scoundrels will do anything. No instance under my own experience.

13. No; not to my knowledge.

14. Yes; decidedly. I would follow my dip to China if I could without fear of trouble, provided I had a good and true vein.

15. Yes. Hardscrabble mining district at this place, by about twenty men, all miners but two, merchants. President and secretary to preside over deliberations and keep the minutes of the meetings. No books were kept. Records went to the County Clerk of Fremont County then.

16. All was done under the act of May 10, 1872.
17. Yes. If found erroneous, or if abandoned or vacant ground was to be added to previously located lode claims and other parts thereof were to be abandoned without detriment to other parties.
18. No.
19. Yes, decidedly; for all local records cannot be made better as if placed with the United States land officers. But a location record should in all cases be kept by the county clerk and ought and should be exact as regards the specific *locus* of the discovery made.
20. Yes, under all circumstances.
21. I have suggested my ideas. Ad. 2.
22. Yes. The limitation should be five years, not more.

PLACER CLAIMS.

1. Three-eighths of the whole area of county. The nature of our mineral deposits is volcanic. Veins, ledges, crevices, lodes hold the deposits. As this region has evidently suffered several volcanic eruptions, the surface of our fissure veins and lodes are displaced, altered, and so much disturbed as to *appear* to be mineral-bearing deposits of irregular surface character, but permanent and continuous developments will ultimately prove the appendages, apices, or surface residues of true fissures all over this region.
2. Yes; I see it working practically every day ever since 1872, and am almost hourly consulted upon some of its questions and merits. I have made most of the locations in this region, and now am intrusted with most of the official surveys. I have mentioned above my ideas in regard to overlapping, &c., which I hold to be necessary of alteration.
3. About three months and about $250 by patent, without contest. Have not seen the workings yet with contest.
4. Have none.
5. Yes. Not exactly defective, but loose.
6. The placer claim ought not to exceed 10 acres, and no individual co-operation or corporate company ought to own more than ten acres. Give more people chances to develop the placer resources. Let companies buy from locators, but do not open too many doors for already rich people to gobble up all the country at once, because they are able to do so under the existing laws. The great maxim of our republican form of government, that of the people, to be "a government of the people," ought to guide our legislation in all its most minute details. Our enormous mineral resources should be principally for *the people*, not for *capital*. Capital is able, labor unable. Now legislate so as to ennoble labor without becoming subservient to the already almighty dollar. Give small lots to many and thus alleviate the *people* without injuring *capital*. The condition of placer claims to-day is such that any number of persons can gobble up a whole valley under the placer-claim section. They can easily insert wash gold in a hole and thus call it a placer ground and take up all the river bottoms, cañons, &c., for no other purposes but for its water-power and town-site purposes, the placer pretense being but the excuse. Make each locator of 10 acres of placer *prove* it to be continuous placer ground. Make him work it at least three months out of every year and prove such work, and make him prove up finally within three years of location for title.
7. I cannot give instances, but I know that valuable *non-mineral* lands have been located and titles obtained under the placer clause by men which were solely obtained for town-lot speculations.
8. No.
9. No.

Respectfully submitted by

CARL WULSTEN,
Civil and Mining Engineer, Miner, and Mine Owner,
and United States Deputy Mining-Land Surveyor at Rosita and Silver Cliff.

Testimony of James C. Boyles, farmer and clerk of the district court in and for Hutchinson County, Dakota.

The questions to which the following answers are given will be found on sheet facing page 1.

1. James C. Boyles, a farmer, and clerk of the district court in and for Hutchinson County, Dakota.
2. Five years.

3. I am holding a homestead and timber claim.
4. I am clerk of the district court and have that advantage.
5. To contested claims it costs about $20, and the time is sometimes over a year to get it canceled, and I think that in a contest case it should be canceled at once at the local land office, and thereby save delay, and let it be open for entry, say, in thirty days, if an appeal is not taken to the General Land Office in that time, and the contestant should have, say, fifteen days after canceling to file, and if he does not enter it in that time, it be open for entry by anybody. It would be a great saving of time, and cause these abandoned claims to be settled upon.
6. A party should have the same right to file before the clerk of the court that he has at the local land office, and not have to make actual settlement before he can file before the clerk. It would save a great deal of time and inconvenience. If they have a right to file before a clerk at all they should have the same they have at the land office; and there should be more stress upon the amount of improvements made upon a homestead, and not so much about the continuous residence. Say, for instance, a single man comes to the country and has no team and nothing to get one with; it is impossible for him to settle down on a piece of wild land, and having no team to work with, and make a living; but if he could leave his claim and work for some one to do some breaking for him and earn money to build a house with, and not be compelled to stay on the land all the time, he would have a chance to get himself a farm. But as it is the law is to help the poor man as I understand it; but as he is obliged to stay on the land continuously it defeats the intent of the law; for a man must have at least $400 or $500 before he is able to go upon a wild piece of land and make a living the first two or three years. If the law would compel him to break five acres and build his house the first year, and the second year cultivate that five and break five more, and the third year cultivate that ten and break five more, and by the end of the third year must move on the land and live thereon continuously the last two years, and break five acres each year and cultivate the other; so at the time for final proof he must have at least 25 acres under cultivation, a house, &c.—say the whole improvement must be worth at least two or three hundred dollars—in order to prove up on the tract. That would give the poor man a chance for farms to be opened up; and that is what is needed. I hope you will inquire into the matter and get the opinion of others upon this subject. I know of a number of men in my county that have done with their homesteads as I have stated, and now reside upon and have good farms opened, and spent all the money they have made on the land; but as they did not and could not live on the land the first two or three years will fail to obtain a patent therefor; and yet have farmed it every year, and spent all they have earned upon the land; and some of them have now $500 worth of improvements upon the land; and it is an injustice for them not to obtain a patent for the lands.
7. Agricultural and pasturage.
8. By giving one man a certain amount of territory to report on.
10. The present is good enough, making the requirements on pre-emption and homesteads, making them open up some of it, and letting them have until the third year to move on the lands; making them open up more of it and not allowing them to be off would be impossible.

AGRICULTURAL.

1. Have plenty of rain.
2. Summer.
3. All of it.
5. None.
13. Yes; only giving him say one section.
15. Could not say.
16. Could not tell.
18. Increased.
19. Cattle are herded.
21. Plenty.
28. Yes; the stakes are burned out and the lines are in all conceivable shapes; should be resurveyed and the lines straightened.

TIMBER.

1. We have but little timber; none to speak of.
2. Cottonwood mostly; grows very rapidly.

Testimony of William M. Cuppett, Canton, Lincoln County, Dakota Territory.

The questions to which the following answers are given will be found on sheet facing page 1.

In reply to interrogatories received from Public Land Commission.

1. My name is William M. Cuppett. I reside at Canton, Lincoln County, Dakota Territory; am a wheelwright by occupation.

2. I have resided in this county nearly twelve years.

3. I have obtained one half-section of the public lands, one quarter-section under the pre-emption law and one quarter-section under the homestead law.

4. I have been clerk of the district court of this county since January, 1871, and have given some attention to locating parties on the public domain; also, making out entry papers and final-proof papers under the pre-emption and homestead laws.

5. Five and one-half years is the average time taken to acquire title under the homestead law. Some, however, make final proof immediately after a residence of five years, while others reside on the homestead for seven years. About two years is the average time taken to make proof and payment under the pre-emption law; however, a majority of the first settlers of this county under this law, owing to the great distance to markets, &c., after living on their pre-emption for several years, changed to homestead, and therefore have lived on the same tract of land for as long as nine years.

6. In my opinion, the pre-emption law is defective in this: Section 2261 of the Revised Statutes prohibits any person who has filed a declaratory statement from filing a second. I believe it would be just and equitable, where parties have changed their pre-emption into a homestead entry, to allow them to make a second declaratory statement for other land and perfect title the same as they could have done on the first. I have but little fault to find with the homestead law as it now is. In my opinion, however, when a party brings a contest against an entry he should have privilege to file his application to enter the land, and in the event of the cancellation of the entry under the contest the contestant may then perfect his own claim. In many instances contestants have been unjustly beaten out of the land after having successfully prosecuted the contest to the final cancellation of an entry by persons who have not a dollar's interest in the land. If this law was changed as I have suggested, it would not only be justice, but I believe it would have a tendency to bring about a more strict compliance with the spirit of the law by the settler.

7. The lands in this section are gently undulating; the soil black sandy loam, with clay subsoil. These lands are excellent for either grazing or agricultural purposes. The lands in this county are all occupied and are used by the settlers chiefly for the purpose of agriculture.

9. I believe the present system of surveys for agricultural lands very good.

AGRICULTURE.

1. The climate is a very pleasant one, and, as a general rule, has a sufficient amount of rain to grow all kinds of crops. The exception, too dry. In my experience, however, I have known two seasons with too much rainfall. As a rule, the snowfall is very light. I have experienced four winters here without sufficient snow for a respectable sleigh ride.

2. The rainfall begins about the 1st of March, and frequent showers from then until the 1st of July. The seasons vary in regard to rainfall.

5. There are no crops raised here by irrigation, and therefore have no experience with the system of irrigation.

12. I am but little acquainted with what is known as the grazing lands of Dakota. I was with General Sully's expeditions in the western part of the Territory in the years 1863, 1864, and 1865, and have some knowledge of the grazing lands, and am free to say there is more grass grows on one acre of land in this county than there is on five acres of that.

15. It is estimated that about 3½ acres of pasturage land in this section is required to raise one head of beef for market.

16. It requires about ten head of cattle to support an average family.

17. There are eight head of cattle to the square mile in this county.

18. The growth of grass is increasing.

21. There is an average supply of stock water in this section.

22. I am unable to state how many sheep are equivalent to one beef in pasturing. But few sheep kept in this county.

26. The approximate number of cattle and sheep in this county is 5,500, and they are kept in herds ranging from 30 to 200.

28. There has been some difficulty in ascertaining the corners of the surveyed lands in this county.

TIMBER.

1. The land of this county is nearly all prairie or lands naturally devoid of timber.
2. The kinds of timber planted are chiefly cottonwood, soft maple, and box-elder.
3. There are no public timber lands in this county, and I therefore cannot give any plan or make any suggestion as to the disposition of the same. There are no mineral lands in this section, and I have no experience in mining.

I am, very respectfully, &c.,

WM. M. CUPPETT.

CANTON, DAK., *October* 23, 1879.

Testimony of F. J. Eisenmann, farmer and county clerk, Maxwell, Hutchinson County, Dakota.

The questions to which the following answers are given will be found on sheet facing page 1:

1. F. J. Eisenmann, farmer and county clerk, Maxwell, Hutchinson County, Dakota.
2. Four years.
3. Under soldiers' homestead act.
4. None.
5. Five years, and $26 for homestead.
6. None.
7. All agricultural lands.
8. Geographical division.
9. No reason.
10. By giving the right to two timber claims in one section, each claim to have 10 acres of timber.

AGRICULTURE.

1. Climate good; rainfall, drought in 1879; length of season, seven months snow in winter about eight inches; water, none.
2. In the spring of the year, and not a great deal of it then.
3. All of it.
11. Lawsuits.
13. At least 200 acres.
14. It would be the best thing the government can do.
15. In 1879 it took 640 acres.
16. Here in Dakota about fifty head.
17. About 100.
18. Diminished since 1877.
19. Have no fences.
20. No.
22. Don't know.
23. Don't know.
24. Yes.
25. None, if good neighbors.
26. In 500; 3,000 in county.
27. Sell school lands.
28. Nothing but trouble.

TIMBER.

1. No timber.
2. Cottonwood.
3. Dispose of it by giving it to actual settlers.
4. Would not.
5. There is not.
6. We have none.
7. There is none.
8. There is no timber cut here.
9. It would, if any.

Testimony of William Haydon, Deadwood, Dak.

The questions to which the following answers are given will be found on sheet facing page 1:

DEADWOOD, DAK., *November* 26, 1879.

To the honorable the Public Land Commission, Washington, D. C.:

GENTLEMEN: I have the honor to acknowledge the receipt of your circular, and also to have been appointed on the bar committee of Deadwood to suggest amendments to the present mining law of Congress. Differing as I do so radically with a majority of the committee, leave was granted me by the committee to submit my personal views, which I do, and submit them, crude as they are, for your consideration, for what they are worth. I have endeavored as near as possible to embrace my views in the form of answers to your interrogatories.

LODE CLAIMS.

1. I have resided for twenty-six years in the mining regions of the States of California and Nevada, and the Territories of Utah and Dakota, and have been engaged during that time as judge of a court of general jurisdiction, lawyer, and mine owner.

2. The principal defects in the present United States law are: the size of the claim and allowing the miner to follow the dip outside of the side lines, and allowing local States and Territories to make local rules and laws on the subject of locating mines.

3. I think the practice should be abolished.

4. The croppings or highest point of the ledge appearing above or discovered beneath the surface. The apex, course, angle, direction or *strike*, and *dip* can in most instances be determined in the early workings of the mine.

5. I answer "yes" to this question.

6. I have.

7. Yes.

8. I cannot call to mind any such case.

9. There may be some instances, but they are very rare. I think in this region there are some.

10. Yes.

11. Under the present law I do not understand that a person has the legal right to "locate alleged lodes on non-mineral ground." The locator, as I understand the law, must first discover a ledge or lode of gold or silver bearing rock in place before the locator has a legal right to locate.

12. Such a case as stated in this question might exist, but, in view of my idea of the law in answer to the previous question, B would not have a good cause of action.

13. Yes.

14. I think not. The right to follow the dip outside of the side lines is one of the greatest sources of litigation.

15. I never have taken part personally in organizing local mining districts, but I am cognizant of much fraud being practiced in California and Nevada in making local rules and regulations. I have known instances where only two actual miners, who discovered a lode, invite a number of their friends from a distance, not miners, to assist in forming a new district, and pass laws most favorable to themselves, elect a recorder, and all done in a few hours over a gallon of whisky, and the guests depart, perhaps never to return. A 25-cent memorandum book is frequently used for the district records and carried about in the recorder's hat or pocket.

16. Generally there is a stake planted at the discovery shaft, on which is placed the notice of location, stating the amount claimed in either direction from the discovery shaft, the corners, the names of the locators, and amount of surface on each side of the ledge, which notice is recorded in the mining-district records. Miners frequently change the names of the locators on the notice and mining records, the stakes, and boundaries.

17. There is generally a provision for amendments, and it is the exception when they are not materially amended.

18. Yes, frequently; some of the grossest frauds I have ever known.

19. I think all local rules, Territorial and State laws should be abolished, and the initiation of record title lodged in the register of deeds' office in the county where the mine is located, and in cases where there is no organized county, then in the nearest county. Also, to file the certificate of location at the nearest United States land office after it is recorded in the county records, so as to form a basis of future action in the land office, if required by the locator.

20. Yes.

21. In answer to the first paragraph of this question it would be easier and more in harmony with my previous answers to say repeal the present law and enact an entire

new code. There would necessarily be so much detail involved in the proper answer to the last paragraph of the question that I am not prepared, satisfactorily to myself, to answer at present as I would upon further consideration; yet I will suggest the main outlines of my theory of the best mode of location and the acquisition of the title.

First. Confine the right to follow the dip vertically downward to and within the side lines. The right to follow the strike should be confined within the end lines. The size of the claim should be 500 feet in length along the ledge, and 2,000 feet in width, which would enable the miner to follow the dip, inside of his side lines, as far downward as would be profitable to work. The miner to have forty days from the time he commences work on a ledge to determine the strike and dip by sinking a shaft or running a tunnel on the ledge, 10 feet deep or more, and within twenty days thereafter to mark the boundaries by placing a stake 3 feet high, or a monument of stone the same height, along the boundary lines every 50 feet; place a written notice, on a stake 3 feet high, at the discovery shaft or tunnel, stating the number of feet claimed, the course, the name of the locator and mine, and within twenty days thereafter to record a sworn copy of said notice in the county records, and ten days thereafter file a certified copy of said recorded notice in the land office nearest the location—in cases where there are no organized counties where the mine is situated, then the nearest county within the State or Territory from where the mine is situated. The time shall be extended one day for every fifteen miles the mine is distant from the place of county records and land office over one hundred miles, except where there are daily or tri-weekly mails to the respective places. Within sixty days after filing said notice of location in the land office he must demand, at the land office where his location is filed, a survey of his claim, which shall be surveyed by a United States surveyor free from all cost on the part of the locator. Within six months thereafter he must apply to enter said land and pay for the same at the rate of $5 per acre. If the locator fails or refuses to apply to enter said claim within said six months he forfeits all right to enter the same, and it shall be subject to entry by any other person without further notice. Mining localities over fifty miles from a United States land office, the United States surveyor shall not be compelled to survey claims unless fifty or more applicants demand it who have filed their location notices in said land office. I think from the hazardous occupation of the miner he should be as much encouraged and his rights guarded by the government as the peaceful agriculturist. At present the method of acquiring a title to mining claims from the government is expensive and cumbersome, and deters and prevents many from applying who otherwise would. If time or space permitted I might offer lengthy arguments in favor of the main features of my plan, which may be summed up as follows: To confine the locators within their lines in pursuing the dip or strike; to give him all within his lines; to abolish all local rules and regulations, State and Territorial; lodge the initiation of record title with some State or United States officer; make it compulsory to enter the claim; relieve the mine from all expense of surveying, and place him as near as possible on a level with the agriculturist in acquiring a title; make the survey, made in accordance with the application suggested, be absolute evidence of boundaries, from which there shall be no appeal; the surveyor shall not make surveys overlapping each other; and all questions appertaining to the acquisition of the title from the government be determined by the land office. In brief, I claim for my theory more certainty in boundaries, more reliability of record title, more certainty as to the title of the ledge in its dip, a relief from seven-tenths of litigation under the present law, and an impetus to mining enterprises and better security for investors, and a large increase in national wealth.

All of which is respectfully submitted.

With considerations of high regard, I am, your obedient servant,

WM. HAYDON.

Testimony of D. A. Mizener, lawyer, Davison County, Dakota.

The questions to which the following answers are given will be found on sheet facing page 1:

1. D. A. Mizener, lawyer, Davison County, Dakota.
2. Seven months.
3. I have sought to acquire lands by virtue of pre-emption timber-culture laws.
4. I am engaged in the land business.
5. From six to eighteen months.
7. They are prairie, moderately undulating, and are good agricultural and pastoral lands.
8. By a general rule.
9. The present system of surveys.
10. I cannot; it is very good now if the law is fully enjoined.

AGRICULTURE.

1. Mild climate; rather light, but increasing; seasons similar to those of Minnesota; not much snow falls; very good supply, but no irrigation.
2. Is needed here at all seasons; the rainfall is very equally distributed.
3. All in this and adjoining counties.
4. There is no irrigation here.
5. None.
8. At all altitudes.
12. No portions; but all can be so adapted.
13. I have had no experience in these lands.
14. I think it is not the best policy to put any lands in the market for private entry, as speculators would usurp from the poor, whom the government wished to protect.
15. This I could not definitely state. Well, and I think that the pasturage here compares favorably with other States.
18. Increases every year, where settled.
19. No fences; they could be.
21. From streams, rivers, and springs in abundance.
22. Could not say.
24. Yes, but not very well.
27. None.
28. Yes, much; and surveyors who laid out the land in sections and one-fourth sections were very careless in establishing monuments. There should be more caution used in seeing the work done well.

TIMBER.

1. Only some scrub timber.
2. Maple, cottonwood, willow and box-elder; cottonwood the best.
3. By sale in small tracts, from one to two acres, for the reason that most could have the use of it; and not held for speculators.
5. There is a second growth; it is generally slow.

Testimony of Ole Sampson, farmer and stock raiser, Gayville, Yankton County, Dakota.

The questions to which the following answers are given will be found on sheet facing page 1:

To the honorable Public Land Commission:

GENTLEMEN: The circular received from you I hereby return to you with the few answers to the numerous questions that have come under my observation:

1. My name is Ole Sampson, residence Gayville, Yankton County, Dakota; my occupation, farmer and stock grower.
2. I have resided here since 1859.
3. I have acquired title to 320 acres of the public lands under the acts of Congress providing for the pre-emption and homesteads to actual settlers.
4. I have never had any means or have I sought any, except so far as pertained to my own titles.
5. I do not know as to any cases except my own, they being uncontested cases, and I complied with the requirements of the departments and the local land office where the lands are situated.
6. The requirements of the departments and local land offices as is now in practice is in my judgment too difficult and expensive for men that can ill afford to pay the extra fees and expenses that have been added by the late law or rules of the Secretary of the Interior. It now costs $31 to perfect title to a 160 homestead, instead of $18 under the former practice. Besides, a person is compelled to employ some person competent to make out all the papers and proofs required that was formerly done by the officers of the local land offices, although now the fees of the officers are double that of former times. The law in that respect should be so changed and modified as to simplify and lessen the trouble and expense incurred under the present rules.
7. The lands in this county are adapted both for agriculture and pastoral pursuits. We have no mineral, as far as yet known.
10. The system of homesteads to actual settlers should be changed by requiring the settlers to plant and maintain a certain number of acres in various kinds of forest trees in addition to the other requirements of the law. The timber-culture act should be changed by requiring so many acres to be planted and the trees a greater distance apart, as the timber would grow better and attain a larger size, or else each claim

should be reduced to 80 acres instead of 160 acres, as now, and allow two entries to be made in each section instead of one. As now, it deprives the majority of settlers of the benefits of the law, and only one-fourth of the settlers can avail themselves of the law. Those that first come to the country take all the timber claims and the later ones cannot procure any, as the 160 acres allowed in each section is previously taken; and I think that such a change would meet with approval by the majority of the persons intended to be benefited by the law.

AGRICULTURE.

The climate is healthy and dry. We have the average rainfall of the western country during the months of April, May, June, and September; very little snow in winter. No irrigation used to my knowledge.

14. The land should be retained for actual settlers; land open to purchasers at will is nearly in all cases held by speculators until such a time as the actual settlers surrounding it has made it valuable, and then sold in small parcels at high prices to settlers; and besides, it retards settlement.

Yours, respectfully,

OLE SAMPSON.

Testimony of Vale P. Thielman, clerk of district court, Turner County, Dakota.

1. Vale P. Thielman, Swan Lake, Turner County, Dakota. I am clerk of district court of Turner County; am a dealer in real estate and locate settlers on public lands.

2. Have lived in Turner County since 1870, when it was organized; was the second settler in it; have lived in Dakota nearly fifteen years.

3. I have acquired the title to 160 acres of government land under the pre-emption law.

4. I have attended exclusively to land matters such as locating parties on government lands, making out their filing papers under the homestead, pre-emption, and timber law, and attending to contested cases for the last nine years.

5. My 160 acres cost me as follows: house 10 by 12 feet, $75; five acres breaking, $25; well, $6; three hundred forest trees, $5; one agricultural college scrip, $170; total, $271. I lived on the land six months, was a single man then; during the six months I earned my board and $87; other cases that have come under my observation that have cost less, and some a good deal more. Under the homestead law a person with any tact can make more than his living and gain title to their land in the bargain.

6. A person in contesting a previous entry has to bear all expenses and has all the trouble, but has no further right to the land than any other person; and in many instances the party who enters and sustains the contest does not get the land. There is at present a system of telegraphing between attorneys at Washington and others here, *perfectly legal*, but it cheats a great many out of land which seems to rightfully belong to them; *i. e.*, A takes a homestead and abandons it, B contests it, comes to trial and proves conclusively that A has abandoned the land, the case goes on its regular routine and it costs B generally from $15 to $100 to work the contest through. In the course of time the contest is ended, and the old entry is declared canceled. B has built himself a house on the land and lives there; in the mean time comes C; he has watched this land, has laid out no money or time (but is the drone); he has employed an attorney in Washington, this attorney watches when this claim is canceled and always knows just when that letter informing the register and receiver of the cancellation leaves the General Land Office for the post-office, he then sends a telegram to his client who at once makes some hasty improvements on the land and rushes to the land office and files on the land before the B finds out that the cancellation has reached the land office, and the result is that B either loses the land or maybe gets half of it. I think it would be justice to the poorer and hard-working class of people if the law was such that the person who contests a claim, has all of the expense and trouble, should also have the first right to file on the land or otherwise have the right to file on the land when he enters the contest, subject to the contest. This would also prevent parties who make a living by contesting claims and making money out of innocent parties from following their calling; *i. e.*, it is a well-known fact that in new countries like this there are a good many people who set themselves up as attorneys; they run across a poor innocent farmer who has not been able to live on his land all of the time, still his land is not abandoned; they file a contest on his land, then go to him and tell him that they intend to take his land from him, and generally make a bargain with him and get from $25 to $100 to withdraw the contest; and a great many other ways there are under the present law. It is also a well-known fact that at least one-half of all the claims of land (or quarter sections) are paid for or proved upon without the parties claiming them having lived on them and improved them according to law. I know personally of several claims where the people never lived on them, also where there

was not sufficient improvement. The law is strict enough, but these matters are not looked into enough. Sometimes witnesses are examined before grand juries but hardly ever any indictments found, as there are so many and it would be hard to know where to begin. I believe if a commissioner or commissioners could be appointed who at stated periods would visit localities and inspect improvements and hear testimony and give titles to land, it would be better for honest settlers and the government, and would hinder the great amount of swindling that is carried on.

7. Our Territory is all (with a small exception, the bad lands) good farming lands. Our county (Turner) is unsurpassed for agriculture or stock raising.

10. It is the opinion of most of the people who are best acquainted that the government is too liberal or gives too much land. A person can now get 480 acres of land, and there is not one farmer out of fifty who can use it. The result is a good deal of our land gets (where it was never intended to go) into the hands of speculators. I think if our laws were so made that any one person could only take 160 acres of a homestead and could only keep that by living on it and improving it, it would be more satisfactory. At present the settlements are so thin that people cannot have school and church privileges, and nearly every other quarter section is owned by some one that does not live on it and that holds it for a raise in land. One hundred and sixty acres of farming land is enough to support a good large family, and give a good support and have neighbors close together, and if parties taking homesteads were compelled to live on them, say, six or seven years or lose them, none but those who intended to take them and make a permanent home out of them would have anything to do with them, and such a law would hurt none that were honest in their intentions, but on the contrary would protect them and keep adjoining land out of speculators' hands.

Very respectfully, your obedient servant,

VALE P. THIELMAN.

Testimony of E. C. Walton, farmer, Gayville, Dakota.

The questions to which the following answers are given will be found on sheet facing page 1:

1. E. C. Walton, farmer; Gayville, Dakota.
2. About eight years.
3. Under the homestead laws.
4. Not much.
5. No knowledge.
6. None.
7. Principally agricultural and pastoral; no minerals and little timber.
8. General rule.
9. No practical acquaintance with surveys.
10. No suggestions unless it be a more rigid ruling as to actual improvements and continued residence on the lands given as homesteads and entered pre-emptions.

AGRICULTURE.

1. There is a sufficient supply of snow and rain; climate dry; six months winter, including one-half fall and one-half winter.
2. Spring, fall, and summer, usually when needed.
3. All.
5. None.
6. No experience.
8. Know nothing about it.
12. About one-twentieth.
13. It is not practicable.
14. It is not advisable.
15. Eight acres, fair average.
16. Twenty.
17. About ten, though there is a material change in the last year, all trying to increase in cattle on account of hard times from grasshoppers.
18. Increased where the old grass is not burned until spring.
19. A Territorial herd law is about all the fence. No.
20. No.
21. The Missouri, Dakota, Vermillion, and Sun Rivers, and Clay, Turkey, and a few other creeks. They often use well-water drawn up by windmills.
22. Ten.

23. Very little knowledge, but think it diminishes.
24. Yes.
25. None, to our knowledge.
26. First, about 3,000 or 4,000; second, from 20 to 250; sheep, 20 to 500.
27. A more rigid rule in regard to accurate surveys and establishing of section corners and quarter corners.
28. Great trouble; a great many have had to have their claims resurveyed to find lines and corners; and, as to timber claims, it should make no difference if there was a half dozen trees or saplings on it, or even a half acre of willows, for that amount often hinders actual settlers from getting their lands contiguous, when in reality the timber on it does not amount to anything to them, as it is often nothing but brush.

TIMBER.

1. Considerable along the Missouri River, principally cottonwood, some box-elder and a little oak.
2. Mostly cottonwood, though there are some nice box-elder groves.
3. I would sell them to actual settlers in five-acre lots, and no more, at $5 per acre, for the reason that all must have timber to improve land and fuel. Some who get timber claims charge $8 to $12 per cord, and settlers object to buying.
4. I would sell in square five-acre lots and no more, at $5 per acre and no more, unless it were in heavy districts of timber and scarcely no prairie, then I would sell in 80-acre lots at $2.50 per acre.
5. Very limited; second growth does not amount to but very little; perhaps a great many sprouts start up, but generally die before large enough for anything.
6. Often started by the Indians. Place them all on reservations, with penalty for any one to start fire purposely or carelessly.
7. It is a great waste; should be sold to railroad by the tie, and superintended by a commissioner, and laps given to actual settlers. All waste prosecute.
8. The custom is to cut and slash away; each individual or corporation tries to get the most, and in consequence there is great waste. Generally, those who cut the tree claim the whole.
9. They would, decidedly, provided the laws were very strict on land officers, with penalties for non-performance of duties, and also penalties for going beyond their jurisdiction.

Testimony of Gustavus A. Wetter, register, and Lott S. Bayless, receiver, United States land office, Yankton, Dak.

GUSTAVUS A. WETTER, register, and LOTT S. BAYLESS, receiver, at Yankton, Dak., testified, November 7, 1879, as follows:

The forms in the land office should be simplified to such an extent that three-fourths of the labor at present performed could be saved. By decisions and constructions the department has increased the labor of making out papers more than 50 per cent.

Fees should be abolished, and the salaries of registers and receivers fixed by law. There is more business and labor at an old office than at a new one, and many old offices do but little over a thousand dollars a year. Old offices answer more letters, handle more suspended cases, and get up more proofs than a new one. Registers and receivers should have a seal. In this district parties have forged the names of both register and receiver of the United States land office, and mortgaged lands through the use of forged final proofs. A seal would obviate this.

Registers and receivers should have the power to subpœna witnesses and perpetuate testimony. Registers and receivers sometimes sit a fortnight now on contested cases. The government should allow rent, as all other offices get rent and fuel. Persons doing business require to be comfortable. Office rent should be allowed in addition to a room in which to hear contests. Titles of instruction to prove up should be abolished, and the law repealed. There has never been a contest since the law passed. The objection notice is now published in the newspapers of any places, and heavy charges are exacted for such publication. The register is burdened with keeping accounts of publishers.

It now requires two to three years, and sometimes from five to six years, to get a patent from Washington. They should be all issued in turn. Members of Congress and attorneys frequently get patents for settlers. This office knows nothing of them; no word is sent here of the issue or delivery of the patent so the books can be marked correctly. In abandonment and relinquishment of homestead, pre-emption, and timber claims, as the registers and receivers take proof and recommend action to the department, and this is the basis of action by the General Land Office, registers and

receivers should at once, on proof of abandonment or relinquishment, permit legal settlers to enter on the land. It now requires from one to eight months to get a tract cleared for entry under this rule from Washington. It makes dangerous and vexatious delays, and casts odium on the district land officers. We know of cases where persons who should have been permitted to file, and were the rightful owners, have been deprived of their rights by parties who obtain information from Washington as to cancellation and take advantage of it.

We see no reason why a settler should not be permitted to file an application for a homestead or declaratory statement, or for a timber-culture claim, as often as he likes. He enhances the value of the land and makes new homes. The law does not contemplate that the first act is final.

The exactions of the homestead law at present as well as of the pre-emption are onerous. The only question asked by the register and receiver should be, "Have you complied with the law?"

This district, 30 miles wide and 90 miles long, is purely an agricultural district. Some timber has been planted, mostly cottonwood and box-elder and oak. Walnut trees have also been planted.

Crops are raised without irrigation. For eight years there have been rains during the summer, enough for crops. They usually come in March and April. We raise all the grains, flax, &c., the same as in the Middle States.

This is a fine grazing country; sheep particularly thrive well on account of dry winters. They are of mixed breeds, and are worth from $2.50 to $3.50. Each sheep clips from 4 to 6 pounds of wool. The cattle are of mixed breeds and some of them are good. Calves are worth from $4 to $5; yearlings, $12 to $15; two-year-olds, $12 to $18; cows are worth from $25 to $30. Butchers pay from 2 to 2½ cents per pound.

We have more than 800 families of Russians and Mennonites, who first commenced coming in 1872.

All the mills on Jim River have been idle for five months, because one B. M. Smith built a dam 14 feet high across the river, which has flooded about 50,000 acres of unsurveyed agricultural land belonging to the government. This was done for the purpose of enabling them to make a lake, so that they could call it reclaimed land, get it meandered by the United States surveyors, locate the fractions around the so-called lake with soldiers' additional scrip; then cut away the dam, let the water out, and claim all the land that the water covered as reclaimed land. The surveyor-general of the Territory ordered his deputies not to meander the lake, so the movement failed. Sixty miles above the dam the river was brimfull, while in Brown County, below the dam, it was totally dry—cutting off all the mills for 180 miles to where it emptied into the Missouri. There was a small summer-dry lake called Sand Lake, just above this dam, which they widened over two townships of United States government land. They claimed they wanted to make the stream navigable from Sand Lake to Jamestown, on the Northern Pacific Railroad, a distance of about 128 miles. The result was the settlers got indignant because they could not water their stock, and the mill men could not run their mills, so some one cut away the dam.

The General Land Office should issue for general circulation, through the district land offices and otherwise, a compact pamphlet containing the laws, points of instruction, and the rights and duties of settlers under the respective laws. This would save correspondence and give much needed information. The only entries in this district are pre-emption, homestead, and timber-culture locations.

All scrip should be abolished, or it should be redeemed by the government in money and not located in lands. They make much trouble and occasion loss, because counterfeits are in circulation. We were informed by the register and receiver at Sioux City, Iowa, that about 200 pieces of counterfeit and forged scrip were located and patents issued before they were discovered. The department ordered back the patents which were still in the district office, but lost those which had been issued. The loss fell on innocent purchasers.

Testimony of Daniel Bacon, publisher of the Boise City Republican, Ada County, Idaho.

The questions to which the following answers are given will be found on sheet facing page 1:

BOISE CITY, IDAHO, *September* 30, 1879.

DEPARTMENT OF THE INTERIOR:

DEAR SIR: In compliance with your request I hereby answer the following questions:

Most respectfully, your obedient servant,

D. BACON.

1. Daniel Bacon, Boise City, Ada County, Idaho, publisher of the Boise City Republican.
2. Thirteen years.
7. The public lands are of several classes. First. Sage plains destitute of water, lying in the most part where they can with considerable expense be irrigated and made productive. Second. Arable lands situated along water courses and in the low valleys, where the labor of irrigation is small. Third. Hilly and mountainous lands, well adapted for pastoral purposes. Fourth. High mountains, covered in the most parts with pine and fir. Fifth. Mineral lands, embracing in a large portion the two latter classes.
8. I would recommend that a commission be appointed (assisted by at least one practical geologist and mineralogist) to designate the several classes.
9. The sage plains should be granted in large parcels to those who will utilize them. The pastoral lands should also be surveyed in large parcels, with reference to the natural water courses, so as to accommodate as many locations as possible. The mineral lands should be surveyed in small parcels, and sold with some restrictions. The timber and arable lands should be subdivided in conformity with the present system—the arable lands disposed of to actual settlers only, and the timber lands to those who own farms, or mines, or saw-mills, or are settled on them and make a subsistence from their proceeds. (Your attention is respectfully called to our editorial on "Vine Culture," which will be found in last week's issue, September 27, Boise Republican, which is transmitted to you.)

AGRICULTURE.

1. The climate is mild. Length of rainfall six months, from the first of November to the first of May, in the valleys. Snowfall in the mountains corresponds to the rainfall in the valleys, with this exception: commences a little earlier in the fall, and continues a little later in the spring.
2. The greatest supply, caused by the melting of the snow, comes when most needed.
3. None.
5. All the cereals and fruits indigenous to the Northern States.
6. Fifty miners' inches on an average.
7. The rivers. The supply is abundant.
8. From my experience and observation on this coast for the last twenty-nine years I am of the opinion that irrigation is especially beneficial to the soil, and that crops can be raised and successfully cultivated in any altitude below 4,000 feet.
9. There is no restriction whatever. The water that is not utilized returns voluntarily.
10. Only a small moiety has been claimed in the different streams, and in Snake River none.
14. Limited. Certainly.
18. Diminished.
19. No.
20. No.
23. Diminished.
24. No.

TIMBER.

2. Lombardy poplar, principally on account of its rapid growth.
3. For the reason that such lands are nearly all mineral lands, and worthless for agricultural purposes. I would favor leasing them in small parcels, say for $1 per acre, and not to exceed 160 acres to any one individual, the time not to exceed ten years.
5. There is a second growth of the same variety; grows slow.
7. The government timber is the chief source of all our supplies for mining, building, agricultural, and fuel. The timber we must have or break up housekeeping, and should it fall into the hands of speculators we would find ourselves removed from the "frying-pan into the fire." If the United States must dispose of it, then parcel it out to those who own mills, ranches, mining claims, and actual occupants, who maintain themselves by their own industry. This would prevent unnecessary waste, and, to a great extent, destruction by fire. Fire alone destroys more than is consumed by all other sources.
8. There is no restriction for cutting; but whoever constructs a road into the timber claims exclusive right to travel the same. Whoever fells a tree has the possessory right to it.
9. I think not. If the land agent should attempt to force an arbitrary law he would be obliged to travel to the mountains and cut his own fire-wood, or aid and abet those who were breaking the law.

LODE CLAIMS.

1. I have been for the most part of time for the last twenty-nine years engaged in mining in California and Idaho.

2. The general government ought not to delegate to the Territorial governments any power to make mining laws. Public land agents should be recorders for mining claims. In the several districts there should be chosen or appointed deputy recorders, whose duties should be to see that the claims were properly surveyed and marked on the ground, and the locator should have proper time to ascertain the direction of his vein or lode, do his first assessment, and on report of the facts to the deputy it would be the deputy's duty to see the work and certify thereto; then, and not until this has been done, should the records be transferred to the books of the public land agent. In Idaho all district regulations have been abolished by the general assembly, and the county recorders are made the recorders of mining claims, and ten days is the limit for making record of claims. This works great inconvenience and injustice in many cases. Sometimes it is difficult to travel to the county-seat in the time required.

3. The practices should at once be discontinued, as it gives chance for litigation that otherwise would not arise. No recorder should be allowed to make a record of the same ground to two parties, and it should be the district recorder's duty to know that the applicant was entitled to the privilege of prospecting the ground before entering his claim on the books.

4. The apex or top of the vein or lode is the highest point of the center of the ledge. The course of the vein or dip cannot always be determined by the early workings of a ledge. In my experience, frequently hundreds of dollars are expended before either the course or dip of a ledge has been determined. I refer you to an article in the last issue of the Boisé Republican, entitled "The Comstock of Montana."

5. They are not.

6. There has been.

7. Yes.

Should you desire more specific answers or explanations to the above, or answers to any questions that have been omitted, I will be happy to serve you.

Yours, most respectfully,

DANIEL BACON,
Boisé City, Idaho.

Testimony of George Chapin, farmer and stock raiser, Goose Creek, Cassia County, Idaho.

The questions to which the following answers are given will be found on sheet facing page 1:

1. George Chapin, farmer and stock raiser, Goose Creek, Cassia County, Idaho.
2. Territory ten years.
3. No.
7. Mostly desert and stock range.
8. All desert lands without water; with water, good agricultural lands; most of it can be irrigated, and canals practicable.
10. Nineteen-twentieths of the public land in Idaho is absolutely worthless without the introduction upon it of water for the purpose of irrigating it. The hills and mountains, good stock range. The plains are a desert without artificial water. Government should grant subsidies to companies or individuals who would construct canals. All valuable and productive when irrigated.

AGRICULTURAL.

1. Plenty of water can be had by the aid of capital.
2. Winter and spring; it comes a little before most needed.
3. None.
4. Nine-tenths.
5. All kinds that are raised at the north.
6. Two cubic feet per second for thirty days.
7. Rivers and creeks.
8. Irrigation improves the soil; 5,000 feet.
9. Waste water usually returned to the stream or main ditch.
10. Only to a very limited extent under United States law and local custom.
12. Mountains and narrow margins of rivers and creeks.
13. It would require thousands of acres of such pasture.
14. Settlers have the unlimited use of these lands now for stock range.

15. One thousand acres each.
16. The increase of 500 head, or 50 milch cows.
17. About three.
18. Diminished.
19. A few have fenced; can be confined safely.
20. Not particularly.
21. Creeks, rivers, and springs.
23. Diminished.
24. Not long.
25. No legal conflicts.
26. Twenty thousand; they roam at large.
27. Greater inducements to those getting the water on them.
28. Yes; the stakes usually rotted off and broken down and lost.

TIMBER.

1. Only on mountain tops—white fir.
2. Poplar; five years.
3. I would reserve the timber for the use of all settlers in this section; would not dispose of them.
4. The timber is on the high mountain peaks and in steep mountain gulches.
6. The government should impose a fine on the careless.
7. Timber here is limited and should be reserved for settlers.
8. United States law.
9. Yes.

Testimony of James A. Chase, probate judge, Marsh Basin, Idaho.

The questions to which the following answers are given will be found on sheet facing page 1:

MARSH BASIN, CASSIA COUNTY, IDAHO, *September* 24, 1879.

Public Land Commission, Washington, D. C.

MESSRS: Herewith I return the interrogatories furnished, together with answers to some of them.

1. My name is James H. Chase; Marsh Basin, Idaho; by occupation at this time probate judge.
2. About two years.
3. I have not for myself.
4. Considerable part of declaratory statements, affidavits, proofs, &c., are made before me as a court of record for the local land office.
5. I hear of no cases from which I can form a rule.
6. Yes; the law ought to be made explicit about parties going *in person*, or not going, to the local office to make final proof. Where parties live more than 30 miles from a land office they should be clearly allowed the right to go before any local officer having a seal and giving bonds and making all proof, and send fees and payments in the usual business way to the local land office. It is a great hinderance in the sale of lands that parties have so often to go and take witnesses on these long and expensive trips. In cases of contest the land officers could be authorized to designate some officer within the county where the land is before whom the testimony could be taken, and forward the same to the local land office or the commissioner general for their consideration and action. Again, I think the general government ought to be bound by the acts of its officers. If I send money in payment for land to a United States land officer, he receiving and receipting for the same, and fails to apply the money to the purpose for which I sent it, the government will not issue to me my title unless I pay again, and perhaps the third time. The fees for newspaper publication in land-office matters and the fees in general might be reduced and a sum stated to be charged and no more allowed.
7. In this county and Territory as well the greater part of the surface of the country is only adapted to pastoral or grazing purposes. It is hilly and mountainous, but with no lack of good soil over hills, mountains, and in valleys. The only timber (pine, fir, spruce, and poplar) grows on and in the cañons of the mountains.
8. Have not given the matter sufficient to suggest better plans than those adopted.
9. The same as last answer.
10. It is one of the severest struggles a poor man with a family can undertake in his lifetime to settle upon, pay for government land, and support his family all at the

same time. Many try it and fail after much deprivation, toil, and hardship. As a rule, in these Territories, to conquer a piece of land and fence it, making it in any way valuable, and paying the necessary fees to land officers, is worth all the land is worth. If the price of land was less the government would derive more revenue from them.

AGRICULTURE.

1. Here the climate is dry, cool, and bracing to man and beast. Rainfall and snowfall are insufficient to irrigate *all* the good and otherwise fertile lands in this Territory. The seasons of mildness here in this county are too short for fruit-growing.
2. The water supply is principally derived from the melting snows, and for the most part comes from the mountains into the fertile valleys when needed to grow and ripen crops.
3. Comparatively none.
4. Not more than one-third of the area in this county, and this perhaps would be true of the whole Territory.
5. Wheat, oats, barley, potatoes, &c., &c., and good crops.
6. No accurate knowledge from which to report.
7. The whole or less of Snake River could be easily taken from its bed and made to irrigate a half million acres of rich and level land. In the near future this must be done either by private capital or the government.
8. Proper irrigation enriches the soil; improper, washes it away. Where land can be watered grain will grow and ripen in good yield 6,000 feet above the level of the sea.
9. Most of the supply of water is exhausted in irrigation; the surplus is returned to natural channel by local regulation.
10. The water has mostly been appropriated where it could be done cheaply; other and larger supplies are awaiting the investment of private capital.
12. Almost the whole area of the Territory, mountains and all.
13. It is not now practicable. When inventions shall render durable fencing cheap, then it will do.
14. It is not advisable to put pasturage lands of this Territory in market until they can be fenced, and then the limits should be liberal—at least one half or whole section.
15. The country is too extensive, too wild, too careless in habits to answer the first of this question, but from extensive travel I think this is the best beef-raising country I ever saw. A fine rich grass grows over the surface of nearly the whole of it, which is sufficient to keep cattle fat the year round.
16. I am unable to answer, but calculators say stock-raising here is equal to 5 per cent. per month on the investment.
17. There are probably 20,000 head now in the county and half as many horses, but few sheep.
18. The grass has diminished largely, but not owing to stock; several winters of light snows in succession have told heavily on the grasses.
19. They do not. As a rule it would be safe to confine cattle on a range by fence, but there are winters in which stock has to be fed.
20. No; a variety of ranges and feed make the best beef.
21. From large and living springs from the mountains.
22. Five or six sheep are considered by stockmen to be equal to one beef in grazing.
23. In all *dry* countries sheep will kill out the grass. It is to be hoped this country will escape the calamity which has fallen upon California through sheep grazing.
24. Not agreeably or prosperously. Sheep leave a stench upon the ground which is offensive to other stock.
25. None to speak of as yet in this Territory.
26. Probably about 5,000 sheep, but the county is almost exclusively given, so far as it is used, to cattle and horse raising.
28. There is much difficulty in finding corners or lines on surveyed lands here; that work has been very sparingly done; it should have been done, and all lands to be surveyed, in such manner that corners would be visible and permanent.

TIMBER.

1. There is very little timber growing in this part of the Territory, and by reason of waste and culling and careless fires it is rapidly being destroyed. Enough of pine, fir, and spruce is growing here to supply all agricultural and mining wants, &c., and it is admirably adapted to the wants of the farmer in fencing. It is not preserved, however, and as it diminishes the climate will be affected by less snow and rain. I do not know of a greater national wastage than in the ravaging of forests on the public lands west of the Rocky Mountains.
2. None.
3. I would sell or give all timber lands to the States or Territories for the use of the

people thereof. They could make it the duty of some county officer, in their respective counties, without additional cost, to protect the growing timber and cause it to be used as a careful private individual would care for his own. To sell it to private parties would lead to a monopoly and cause much trouble to actual settlers. As the law now is, it is wholly inoperative with timber here, and the officer in whose care it is a thousand miles away. If the government continues to own such lands, a more effective way must be found to protect them. Men there must be whose especial duty it is to watch over the timber in these western Territories. If ever sold to private parties, very small tracts only should be sold to each party.

4. It would seem to be impracticable to classify them, for if in this Territory they are timber lands at all they are just alike and small variety of timber.

5. This country is hardly old enough in settlement to say what the second growth, if any, would be, but so far as I can observe, and I take an interest in all these matters, where timber has been cut so as to leave the ground nearly stripped of trees a kind of scrub bush, with wild cherry and service bushes, utterly worthless, spring up and take full possession of the ground.

6. The loss to this Territory by forest fires is incalculable. Every summer they rage, and they utterly destroy all green timber in which they burn. At the rate which I have observed, in three to five years there will be no green timber left in this Territory, and from that it will become almost uninhabitable. Empires preserve their forests; republics do not. It is not difficult to give the reason. From my judgment I reason that in almost every case these fires originate through carelessness and wantonness of men living near the timber. It is often rumored that Indians set the fire in a spirit of revenge, but I cannot discover any evidence leading me toward a belief of this. Nearly all these fires could easily be controlled and extinguished at their beginning, but "what is everybody's is nobody's business," and from indifference and an unaccountable apathy on the part of the settlers they are allowed to burn for months. There is law to make men turn out and assist a sheriff against a common enemy; there should be a law compelling men to assist the proper officer to put out the forest fires when called upon.

7. The wholly unnecessary waste of the timber on the public lands west of the Rocky Mountains in destructiveness is second only to fires. Every man pushes back, cuts, and culls the best, and breaks and destroys much of the young and thrifty timber. More close and stringent legislation would cure this evil, as well as control the fires. All laws passed by the general government up to this time looking to the protection and preservation of its timber, from my own observation, have been wholly ineffectual to check the destruction and waste. They are too far away, uncertain, and unexecuted. Millions are given for harbors and rivers for commerce, and hardly a farthing for the preservation of magnificent forests inland.

8. Every man owns all he cuts, and from a spirit of greed or speculation they often cut much more than they use.

9. Probably not; because the land officers are as far away and are no more interested in them than the present marshals.

MINERAL-LODE CLAIMS.

1. My experience in mining or opportunities for observation have been so limited that I can hardly make a suggestion further than to say that my impressions are that the law is not clear or explicit enough on the number of lode claims an individual may locate and hold. I have known of men in California and Nevada and this Territory to hold by location from one to twelve claims of full dimension. It is common practice among miners, or rather men speculating in mines. This often works a hardship on men seeking ground to work, and being unable to buy from the speculators. The law in this matter should be made clear and limit an individual to one claim in a State or Territory by location, and this should be worked to some extent. The law requiring $100 worth of work yearly, in practice, is but little observed. Changing the law to meet such requirements would give employment to more men and more of the valuable ores would be extracted.

19. My opinion is that all mining-district laws, customs, and records could well be abolished as to future locations. They exist in so many and different localities and requirements they are a source of confusion to the miner. In nearly every instance these local laws and customs made in mining camps are of the flimsiest kind and least respected. Often a recorder is elected who is hardly able to write his own name. No books are provided, and the next week, perhaps, the recorder is up and gone for new diggings, leaving no successor. The only deference and dignity these local laws have is paid to them by the United States Congress. I am of opinion that the government can make a few and plain rules and regulations touching the location, size of claims, work, corners and lines, and possessory title, which, when disseminated through mining localities, would be more satisfactory to all concerned than the present local customs or laws.

20. I think the adjustment of controversies concerning mineral lands prior to issue of patent should be left where it is, in the courts, because in those cases intricate questions and points of law often arise, and land officers are not noted for their legal knowledge; indeed, for the most part, they are better known for their ignorance of the law and its practice. The whole plan of bringing litigation before tribunals unread in law and strangers to the practice of it is wrong and dangerous. Besides, the courts are held in every county, while the district land office may be two or three hundred miles away; this of itself would be an unbearable hardship. The tendency to make district land officers judges and courts of litigation ought to be, for the convenience of the people, restrained rather than extended.

22. Parties ought to be required to procure title to their mineral ground within a reasonable time. Two years from location would be reasonable. Much valuable mining ground has been entirely worked out, especially in California and abandoned, and this oftentimes by foreigners, without one cent being paid the government. No other country on earth is so negligent of its own interests and the protection of the rights of its citizens as this in respect to the working of her mines. From my own observation, thousands of foreigners take out their first naturalization papers for no object only to gain the right to locate, work, and traffic in mining claims, and when they get a sufficient sum they go back to their native country, never having the least intention of becoming a citizen of this. The first papers alone ought not to afford any rights or privileges in mining matters to a foreigner. Under our laws our mines of precious metals are being depleted, worked, and made available for wealth to the foreigner just as well as to an American born, and this is especially true of Canadians and English subjects, who make great complaint if an American catches a mackerel on their coast without paying for it, and they have to pay very dearly too. I know all this is *wrong* and ought to be remedied, and that quickly.

PLACER CLAIMS.

1. But little mining is carried on in this county; only some claims along on Snake River of very fine gold in gravel, but the ground is extensive for future locations.

2. I am somewhat familiar with the workings of the law. The law is obscure as to the amount of annual work or expenditure on placer claims. One hundred dollars' worth of work is generally construed to apply only to lode claims or quartz claims. It should be made definite on placer claims.

3. No data from which to speak.

4. No data from which to speak.

5. Prematurely answered under Question 2.

6. Answered under Question 2.

The size of placer claims is too large. There are more miners than mines. Ten acres would be plenty and just as effectual as more in the finding and developing of the ground. It is easy and common practice to consolidate claims in the hands of one man by purchase. It is also common practice for a miner to locate himself a claim, and then exhaust all or most of the ground in locations for other and distant or indifferent parties, and then procure a bill of sale or deed from those parties for nothing or a trifle, and then he owns the whole. The law in this respect should be clear that to make a valid location the party himself must go in person and make it.

COAL LANDS.

Concerning coal discoveries or lands, the same requirements should be made, and the number of acres in a location reduced from 160 to at most 80 acres. Like placer claims, if the coal ground is of any value, 10 acres of the former and 80 acres of the latter is plenty for one man. The time for title, price, and mode of procedure touching coal lands is well as it is. Every case of litigation in placer mining, within my observation, has arisen on the insufficiency of corners and lines being established and made visible. The law, however, bearing upon this is correct, and if changed at all should be made more stringent.

7. I do not know of any such instances.

8. I do not know of any such instances.

9. I have no knowledge at present of such case.

GENTLEMEN: All of the foregoing answers have been somewhat hastily written and they are based upon my better judgment. No doubt your attention has been called to all of the points or suggestions, given more fully and clearly than I have done, but none will be given in a kindlier or more sincere feeling to help improve the laws looking to the better protection of our public lands, forests, mines, citizens, and our government.

Very respectfully, your obedient servant,

JAMES H. CHASE.

Testimony of I. S. Singiser, receiver of the land office, Oxford, Idaho.

I. S. SINGISER, receiver of the land office, at Oxford, Idaho, testified September 20, 1879, as follows:

I think the register and receiver should have the power to summon witnesses and perpetuate testimony in matters relating to the land office. I believe in abolishing all the recorders of land districts and putting all the business in the United States district land office. I think, also, that the timber lands of the United States would be better protected if they were in the hands of the United States Land Office than they are now. I think that the notice of intention to prove up the land entry should be abolished. I do not see any use in it. It makes a strife among the newspapers who seek the advertisements. As the Land Department acts upon the proof taken by and the recommendation of receivers of the Land Office, I think it would be best to make the cancellation of land entries a matter for the register and receiver, and let the man on the land have the advantage in making the filing. The people down here think a man should be allowed to make as many pre-emption filings as he wants, going from place to place, until he finally gets a home. As you have a pre-emption clause in the homestead act, I think if you increase the acreage of the homestead that one act is sufficient.

I think there should be a pasturage homestead. I think that about 20 acres would sustain a beef and about 6 or 8 acres would sustain a sheep. Sheep tramp out everything. The greater part of water rights in this Territory have been taken up. There should be something done in regard to getting the marsh lands of the Territory in the market. We have four or five thousand acres right at Oxford, the best land in the Territory. Nobody owns it. It is not surveyed, and people are cutting hay from it.

There is another thing. I don't think the extra two years allowed in proving up on the lands is of any use; it only makes work in the land office, which has to send out two notices. I think all the papers of the land office might be consolidated, and there is a lot of questions in the final proving papers that are perfectly useless. I think it would be a good idea when a man comes to prove up a homestead or pre-emption entry to ask him just this one question: "Have you complied with the law?" and make the witnesses swear simply: has this man complied with the law?

I think it should be so arranged that the register and receiver could go about in their districts and take testimony. It would be a great accommodation to the settlers certainly. There was one man who came to our office who had to stage it two hundred and fifty miles and then fifty miles on horseback. I think that the pasturage lands of the Territory should be sold, and I think that the timber lands should be sold in small tracts not to exceed 160 acres, preferably to actual settlers. I think that timber lands would be more protected if people owned them themselves. It would stop depredations. There are a good many fires in Idaho. Indians and prospectors, &c., start them. They have been burning now during nearly all the summer. They have burned some of the finest timber in Idaho.

There is another subject I wish to speak of. We have a large Indian reservation in our district which is not at all utilized. It should be opened for settlement. It is about seventy-five miles long by sixty miles wide, and only the upper end of it is used by the Indians. The lower end of it is filled up with settlers. There are, I suppose, fifty or one hundred settlers (families) upon the reservation. They have been there many years, and the Territory of Idaho exercises its jurisdiction over them in collecting taxes from them. I think that there should be some system devised by which the rulings and decisions of the Land Office should be distributed to the various local land officers.

Testimony of John Wood, stock raiser, residence State Creek, Idaho.

The questions to which the following answers are given will be found on sheet facing page 1:

1. John Wood, stock raiser; residence State Creek, Idaho.
2. Sixteen years.
3. The land here is all unsurveyed.
7. Agricultural, pastoral, and mineral.
10. In my opinion there is none.

AGRICULTURE.

1. The climate on the rivers is mild; but very little snow, except on high ranges.
2. In the irrigating season there is no rain.
3. None.

4. About one hundredth part of this section.
5. Any crops that can be raised in a northern climate.
6. As much as in any other country.
7. There is plenty of small creeks along the foot-hills.
8. Crops can be raised at an altitude of 3,000 feet.
10. Under mining laws.
11. None.
12. Ninety-nine per cent.
13. In my judgment it should be homesteaded, and each homestead should have a section for pasturage.
14. It is, in my judgment, advisable to put the lands here in market for private entry, and the quantity to each purchaser should be limited.
15. Ten. This is the most mountainous.
16. One hundred head.
17. About fifty head.
18. It is about the same as when I first came here.
19. They do not fence, neither can they be confined with safety at any time.
20. They could not be confined.
21. Springs and Salmon River.
24. They will not; sheep will drive cattle off.

TIMBER.

1. There is no timber except on the high ranges, which is fir and pine.
2. There is none planted.
3. The present timber law is as good as any.
4. I would not.
7. There is none here.

Testimony of John C. Young, rancher, Marsh Valley, Oneida County, Idaho.

The questions to which the following answers are given will be found on sheet facing page 1:

Answers to questions submitted by the Public Land Commission.

1. My name is John C. Young; reside in Marsh Valley, Oneida County, Idaho Territory, and am a "rancher."
2. Have lived there only a few months, but was born and raised in Utah.
3. Have acquired 160 acres of land under the desert act and have sought to acquire 80 acres under the timber act, but have failed on account of grasshoppers.
4. Have been four years in the newspaper business and have watched the acquirement of lands under the present system pretty closely.
5. The expense and trouble of acquiring title to desert land is great owing to the outlay for constructing irrigating ditches. I believe that desert lands should be sold to canal companies incorporated under a State or a national law, which law should compel the absolute transfer by such companies of the water right with the land so redeemed by the canal. In the Rocky Mountain region all land is desert except natural meadows, which are limited both in numbers and extent; that is, no lands in this region, with the exception named, will produce agricultural crops without irrigation.
6. In Utah, it seems to me, the law does not protect non-Mormon settlers. I was once burned out and driven off a quarter section of public land because a Mormon settlement in Idaho "claimed" said land as a "co-operative herd ground." Now, Mormon settlers ought to be protected in Utah, but I presume they never can be fully until Mormonism as a theocracy is suppressed.
7. The whole Rocky Mountain region is made up of series of mountain ranges and valleys, with rivers, mountain streams, and springs, so that the public lands might be classified as irrigable, swamp, pasture, mineral, and timber, at least so far as Utah, Colorado, Nevada, Western Wyoming, Eastern Idaho, and perhaps Arizona and New Mexico are concerned, though as to the two last I cannot speak from actual observation. The irrigable and swamp (or meadow) lands are confined to the valleys; the pasture lands are the high "benches" or uplands lying above the lines of feasible canals and below the pine or timber line on the high mountains; and also those parts of valleys which cannot be reached by canals owing to the rolling character of the surface of the land. Such rolling in valleys I have noticed only near the northern, eastern, and southern rims of the Great Basin. The mineral and timber lands are about the same; that is, mineral, excepting coal, is found usually in the high mount-

ains, the mineral discoveries being made among the timber; but, of course, there are exceptional cases. As the rainfall is limited in the region indicated, and perhaps in Montana, while they have an abundance on the Pacific and Missouri slopes, I think the Rocky Mountain region from the British line to Mexico might with advantage to settlers and the government be constituted a geographical division, with the lands classified as I have stated.

10. In this region I believe the meadow or swamp lands ought to be acquired by homestead or pre-emption as under the present system, because they are the most valuable, yielding a return from the time the settler "squats" on them. The reclamation of irrigable lands by canal and the payment of $1.25 per acre to the government should entitle every man to a quarter or half section where he makes the reclamation individually. Sales to canal companies should be governed in quantity by the capacity of their constructed canals. Such grants or sales should be made conditional, the canal companies being required to offer the land for sale to settlers in lots of from 40 to 320 acres at a price to be fixed by the United States district land officers, who should be required to base such appraisal on, say, double the cost of the canal and $1.25 per acre on the tract reclaimed. Proof of the cost should be established by the company, and the settler should be made to establish his *bona-fide* intention of purchasing only for himself. The purchase price to be paid into the land office and a draft on the United States Treasurer issued to the canal company for the amount of the purchase-money, minus $1.25 per acre for the tract of land and the water right so disposed of, and such water right should be fixed at one miner's inch to the acre, or seven miner's inches to the acre once every week.

AGRICULTURE.

1. The climate is good. We have little or no rainfall from the 2st of June to the 1st of October. We have only two seasons, winter and summer, the later season lasting six months. The snowfall varies from 6 inches to 2 feet and is our source of irrigation streams.

2. We really have no rainy season. Our irrigating season extends from the 1st of June to the 1st of October, and we have high waters from the 15th of May to the 15th of June, when the streams begin to fall and continue to diminish in volume until the weather gets cool—October.

3. No portion of this country can be cultivated without irrigation, though the swamps yield hay.

4. I should judge, excluding the pasturage, timber, and mineral lands, that all the valleys might be classed as irrigable lands, and the proportion of these to the whole region I guess to be a tenth.

5. All the cereals and roots and the more hardy fruits are produced here by irrigation.

6. It will on an average require 500 miner's inches of water to irrigate 100 acres of wheat three times from the 1st of June to the 10th of July, but the same stream would under proper and economic regulations probably water 300 acres and mature the crop.

7. The rivers and mountain streams are the source of supply of irrigating water. Bear River in Cache Valley, the Logan, the Cub, and other smaller streams. The Snake River in Eastern Idaho would furnish a supply of water constantly sufficient to bring under cultivation between 75,000 and 100,000 acres of very good land lying on the east bank of said river and extending from the south fork thereof to the Blackfoot River.

8. Unless an irrigating stream is impregnated with mineral the process of irrigation enriches the soil by depositing thereon lime and alluvial soil, so that as a rule irrigation is also a fertilizing process. Oats can be raised at an altitude of 6,500 feet, wheat at 5,500, but this varies according to the season.

9. All the water in the irrigating ditches is used during the summer and returned to the main streams after harvest. In Utah they have a very good system of irrigation laws. In Idaho there is no law on the subject—that is, not statute—though the common law has been extended over the Territory by the legislature, and I presume that would determine a water contest. The common-law rules on water rights in this mountainous country I think are almost totally inadequate, because, if insisted on by the first settler on a stream, the stream could not, in a majority of cases, be utilized by subsequent settlers.

10. In Idaho we are practically without either law or custom.

11. The pick-and-shovel conflict has frequently arisen between the saintly brethren in Utah.

12. At least one-half of this entire region is adapted to pasturage only.

13. It is not, in my judgment, practicable to establish homesteads on pasturage lands, because the stock-raising business cannot be carried on by men of limited means. They find it necessary to join with it farming. Furthermore, stockmen in this country

are obliged to put up hay in sufficient quantity to "carry over" their cattle. The pasture lands yield no hay and are fit only for summer range, save in some winters when the snows are light and the winds high, the hills are swept bare, and cattle winter out; but even then stock seek the valleys, and this habit indicates that the hills are no place for them in winter, and therefore no place for a homesteader on pasturage lands.

14. In my judgment, these lands should be put in the market for public sale and not at private entry. These lands have very limited water supplies, or, as is more frequently the case, no supply of water at all closer than five or six and sometimes even ten miles. Take a place, therefore, with a feeble spring of water, ten miles from any other spring or stream, and allow a man to homestead this spring, and he henceforth holds the key to the entire pasturage lands for ten miles around him. If this spring and the range it commands were put up at public sale, say at from 10 cents to 30 cents per acre, the spring would sell the entire tract. Pasturage lands with mountain streams running through them would permit of smaller divisions, and such streams ought to constitute division lines, so that purchasers could all get their stock to water.

15. The average quantity of pasturage land in this section required to fat one beef for market, without ruining the pastures, is about 40 acres. This section is hardly as good as Colorado and Wyoming.

16. Two hundred and fifty would support an average family without joining farming with stock-raising; but the families in this country are more than average.

17. I cannot guess.

18. The growth of grass has diminished.

19. The ranges are not fenced. Cattle cannot be confined by fences on the range in winter with safety.

20. The quality of herds would without doubt be improved by confining them to specific ranges.

21. On the pasture lands proper the supply of water for stock is the small springs and mountain streams.

22. The Commission made a mistake in asking this question. They should have asked, "How many beeves are equal to one sheep in grazing?"

23. The grass is killed out where sheep have been pastured.

24. Cattle will not graze on sheep pasture, though the mutton is not particular as to who has been over the grass before him.

25. If the sheep don't leave the cattle range, the cattle soon become so much reduced in flesh that they cannot get away.

26. I cannot guess, and the people in this country pay no regard to such matters.

27. I have this suggestion to offer about the Ross Fort Indian reservation in Eastern Idaho. This reservation covers the best agricultural and stock-raising portion of the Territory and covers an area not much less than the State of New York. I believe this tract of land is owned by about 1,200 Bannock Indians, who, if it were divided up equally between them, would each—every buck, squaw, and papoose—have a small dukedom. Is not that kind o' spreading on to poor Lo a little too thick?

28. Question not answered.

JOHN C. YOUNG.

Testimony of Col. Geo. L. Shoup, Salmon City, Idaho.

Col. GEO. L. SHOUP, who resides at Salmon City, Idaho, testified, October 2, 1879, as follows:

Up in the northwestern portion of the Territory the land can be cultivated, but that I do not wish included in the estimate I make that one acre in seventy-five can be irrigated. The water supply, taking it on an average since I have been here, has been about the same. About four-fifths of the Territory is arid land; about one-third of the arid land can be used for pastoral purposes. It takes about 25 acres for one beef; that I consider enough. I owned about 3,000 head of cattle, but no sheep. It has never come under my notice, but from representation I should say that cattle and sheep cannot feed together. My county is fully stocked. The range is decreasing from overfeeding. If we owned the ranges we could keep them up and improve the quantity and quality of the beef. The increase of 100 head of cattle will keep an average family very well. The pastoral homestead idea strikes me favorably. If it is established it will be necessary for the stockmen to decrease their herds, unless the government makes some provision by which actual settlers will be protected, by allowing them to purchase this land, or lease it, or doing something that will place the land under control of the actual occupants. I think 10 cents per acre would be a very good price for this land. There is plenty of water. In that region everybody takes the water as they please. The rule in our section of country is that by making a location and taking the water from the stream and recording it in the county recorder's office a man

gets a priority or right to that water, and no matter if he makes his ditch big enough to take in all the water, there is no rule requiring him to turn it back; but it is local usage to do so. In some mining districts they have local laws compelling them to turn the water back into the stream.

We have no sheep in Lemhi County. Ours is considerd a well timbered county; one-half of it is timber land, all of which is pine. We have no hard wood. We have big timber fires there, caused, I guess, by Indians, and occasionally by prospectors. These lands should be sold to actual settlers. If they were sold to individuals they would then have an interest in and protect them. It would be to their interest to do so. I would limit the size of the tract to be sold. I would sell it at a price depending upon its location. In our section the young growth comes up after a fire. There have been locations made under the pastoral law, and they have never paid for them. There should be a limit for paying for these placer claims. I have known instances, outside of our county, where a man selected a tract of land, working it enough to take it and then hold it for speculation. Lemhi County is the best watered county in the Territory.

Yoke Fork, Bay Horse, Leesburg, North Fork, and other mining districts are in our section. It is a very good mining district. I think it will produce more than any other three counties in the Territory. We recently had local mining laws, but now our laws conform to the United States laws. A law should be made compelling a miner to pay up inside of two years. We have not had much litigation as yet, but we expect it is coming. What litigation we have is on account of relocations. In a district where the veins lie parallel the same trouble would occur under a square location that occurs now. I think the charges in mineral surveys, &c., ought to be reduced. I think that all the business should be transacted in the district land office, and, just as in agricultural lands, all contests ought to be tried in the district land office; but in many cases the land office is so far away that it causes a great many people trouble to bring witnesses. If a law was passed so as to permit proof to be taken in a mining district and certified to before the clerk of the court of record, cases could be tried in the district land office and that objection obviated.

We have a splendid supply of water for irrigation if we need it. The altitude of the agricultural section of our county is from four to five thousand feet. The pastoral lands are above that. They are about 10,000 feet. The timber land is at about 10,000 feet altitude. We can raise all the cereals and all kinds of vegetables. We can raise corn, but it does not mature well. Our supply of water is ample for all our irrigable lands.

If a man buys a mine I would give him the timber that stood upon it, but I would sell the land separately, and I would reserve all mineral rights to the government. I think the timber land should be placed under the control of the register and receiver. I have but one patented mine in Lemhi County, and it took two and a half years to get the patent after I had paid for it. I think the law should be amended so that when a man gets a register and receiver's receipt that it is his property.

Idaho is a mineral and pastoral country. Our wealth lies in the mines and stock. There is no bunch-grass in our county.

My views regarding the disposition of the agricultural and pastoral lands are these: Those portions of the land that are agricultural should be opened for pre-emption for agricultural purposes at $1.25 per acre. In making any change in the law I would reserve the irrigable lands and dispose of them under the present law. I do not think I would pass any law to assist companies in making irrigating projects. Cattle can be fenced with safety if the stock-owner could secure land either by lease or purchase. Very little timber has been cut off in our county. We have no surveyed land in our county. I think the whole of it might be surveyed. There are about one hundred farms in my county which have no title because the land has not been surveyed.

Testimony of William M. Courtis, M. E., metallurgist, Wyandotte, Mich.

The questions to which the following answers are given will be found on sheet facing page 1:

1. William M. Courtis, Wyandotte, Mich., metallurgist and mining engineer.
2. Eight years in Wyandotte, Mich.
3. Yes; mining claims in Colorado.
4. Have been in most of the mining districts of the State examining mining properties, titles, &c.
5. Can't say after four months; patent not issued yet.
6. Have noticed the following case in location of coal land claim on unsurveyed land, viz: A located claim of 160 acres, having only one place (on account of steep mountain side) from which his coal could be easily worked. B located adjoining 160

acres and had the township surveyed. When the town line is run it rearranges the claim lines so that B takes in A's dump land, which also happens to be the only good timber, making A's coal land valueless. B, however, to avoid a long lawsuit, compromised with A and pays about one quarter A's price before the lines were run. (Bunn *vs.* Smith, Crested Butte, Gunnison County, Colorado).

Have also noticed in locating mining claims the following difficulty: A and B are friends, and each locate 1,500 feet on same lode, intending to adjoin and work in concert. The measurements are made and stakes set up by tape-line measurements. When the properties are surveyed for patent it is found that there is from 50 to 200 feet between the claims not covered by claim notice on stake. This is either staked by surveyor or some camp loafer who makes it his business to follow round with the surveyor and locate such excess to force the parties to buy him out, as such small locations between are in the way, as he well knows. I think there should be a provision in the laws regulating location of mining claims, that if an excess is found between two claims caused by *bona-fide* errors in location stake the locators of those claims shall have sixty days to set new stake, each taking one-half, and the legal assessment on such piece shall be in proportion to the part of a full claim it may be.

8. By general rules; but make the classes to take their name from the greatest value for the location. Postmasters should report to the land office discoveries of mineral in their neighborhood, so that lands held, say as timber land, could then be changed to mineral land.

9. Think present laws are pretty good when not evaded.

10. At present a legal residence is far from an actual settlement as intended by law. Persons and companies buy up the rights of others to enter land. Laws should be more stringent in defining "actual settlement." No experience on agriculture and timber questions.

LODE CLAIMS.

1. As assistant manager at Van Buren Furnace, Shenandoah County, Virginia, 1869 to 1871; metallurgist and manager of the Wyandotte Silver Works, Silver Islet; mining expert and surveyor for the Silver Islet Mining Company, of New York; mine in Ontario, Canada, from 1871 to 1875, 1878 to 1879; manager of the Duncan Silver Mine, Boston County; mine at Thunder Bay, Lake Superior, 1875 to 1878; superintendent and metallurgist of the Gage Hagaman Smelting Works, Leadville, Colo., and for the Iowa Mining and Smelting Company, of Crested Butte, Gunnison County, Colorado, same parties. Have made complete underground survey of Silver Islet, Ontario. Have examined the iron mine of Leadville as expert for trial, but was not present at trial.

2. See answer number 6, page 2.

3. Think no overlapping claims should be filed, but the right title decided at once as soon as overlapping survey is presented. I own one-twelfth of the Muchichanock location at Leadville, Colo. Were first on the ground and worked continuously; but have been surveyed over several times. In one case the parties were overheard to say all they wanted was a compromise and get what they could. We struck mineral of 232 ounces on first contact, but are sinking to second, so as to hold against the parties that are working on our surface. I don't think the lode laws should apply to Leadville, as there is no lode, but a deposit separated from the porphyry wherever it is found; not always rich in silver, but of the same nature in gangue.

4. I understand the apex of a vein or lode to be the outcrop in the highest geological level, whether this is accidentally higher or lower than some outcrop caused by denudation or slip. This and the dip cannot be determined without fail without work; but in most cases it can be.

5. Not in the few cases which are abnormal.

6. Yes; but have only hearsay knowledge of all the circumstances; and from what I know it has been more the intentional misunderstanding of jumpers or sharpers than real conflict between two *bona-fide* miners.

7. Yes; at Eureka mine, Tintic, Utah.

8. No.

9. Claimed to be; but I don't believe the so-called outcrop is really outcrop of a lode, but the exposure of side of lode.

10. Yes; by the claim being located before the true course of vein was determined or could be.

11. I think not.

12. Such a case is claimed for the Iron Mine *versus* Silver Wave and others, too well known to need explanation; the trouble of all the mine litigation at Leadville being trying to make the peculiar mineral deposit there come under the head of a vein or lode.

13. I think so; but the trouble lies in parties claiming on one side or the other what is very doubtful. They should be made to prove their claim before any injunction could stop the work of the other party.

14. Such a provision should be retained for lodes or veins having a dip of at leas 25°, but nothing less should be treated as a lode, except under special cases.

19. Yes; by far the best plan.

20. Yes; by far the best plan.

21. Besides what have been noticed. Would have a provision that whenever a claim is located for the purpose of striking mineral not exposed on surface that claim shall be bounded by vertical planes of side and end lines, no matter what may be struck on claim, vein, lode or deposit. Where a claim is located on mineral outcrop the mineral from which extends in all directions from said outcrop, such claim shall be bounded by vertical planes passing through side and end lines. This shall apply also to beds that may have been faulted so as to present barren rock on one side but the bed has been rediscovered on that side at a different level, a geological fault being clearly proved.

22. Yes, the time should not be less than two summers (as many places are not worked in winter) nor over three years in all.

14. No mineral deposit having a dip less than 25° shall be classed as a lode or vein unless it has two perfect smooth walls beyond dispute and cuts the country rock otherwise than parallel to its bedding, if the rock is sedimentary. The dip of a vein shall be its average. In case of dispute the proof shall lie entirely with the party making the adverse claim, who shall pay in advance to the land office the expenses of examination. If the claim is proved good to the proper officer of the land office, he shall then issue an injunction on the other party to stop his work of taking out mineral until the claim is settled. The case shall then be tried, and both parties bring their proofs before a land office court, formed to judge of all mining disputes. Such land office court shall comprise two lawyers and two mining engineers by profession and one land office official *ex officio*. The four first shall be appointed by the President for life. The court shall hold its sessions at or near the place in circuit.

Testimony of N. Armstrong, Glendale, Beaver Head County, Montana.

N. ARMSTRONG, of Glendale, Beaver Head County, Montana, testified at Butte City, September 28, 1879, as follows:

I have heard the statement of Mr. O'Bannon, and I concur with it, except that I think the mining claims ought to be recorded in the district land offices. I think two years is sufficient to pay up on a placer or lode claim, and I think that the width of claims ought to be defined; that no district should be allowed to restrict the amount of a grant. I think the government allowances should be taken everywhere. I am satisfied with the present United States mining law. I think that the local mining laws ought to be abolished.

Testimony of Orville B. O'Bannon, attorney-at-law, Butte City, Deer Lodge, Montana.

ORVILLE B. O'BANNON, resident at Deer Lodge, testified at Butte City, September 28, 1879, as follows:

I have been in Montana since June, 1867. Formerly I was register at Helena. I am now a practicing attorney before the district courts in Montana. I have been pretty well over a portion of the Territory. My business has called me all through the country; am conversant with the public lands and the land system. I think in the western portion of the Territory one-sixteenth of it can be irrigated. One-fifth of the lands in the western portion is timber.

Montana is hardly an agricultural country; it is a pasturage, timber, and mining country; about three-fourths pasture. The future wealth of Montana will be mineral and pasturage. I think that some law ought to be passed as soon as possible by which the title to the timber land should pass from the government to the individual. I do not think the government will ever be able to protect the timber lands; only private ownership will do it, and I would put the jurisdiction of the timber in the hands of the register and receiver of the district land offices.

Some classification should be made of the land, and the amount sold should be based upon that classification. I would sell it in tracts of 40 to 320 acres, and I would prefer actual settlers to outsiders, and I would limit the rights of persons to one entry. I would charge according to the classification as to the amount entered. This classification should be made by the deputy surveyor, under the direction of the surveyor-

general, and subject to approval by the inspector of classification. In mineral localities I would sell the timber subject to the mineral rights; outside of the mineral rights I would sell it absolutely. I would sell a miner the timber on the top of his location, and would put the records of the mining claims in the possession of the county recorder. The title is tried at the county seat, and let the record be there also. If the records are destroyed let us do as we do in all similar cases, taking the most reliable testimony that can be obtained. I think that in all cases of actual possession of a mine or a mining claim such possession should be stated in the application before a miner is allowed to make an entry. I know cases of this kind where the man who originally owned a mine was compelled to make adverse filing on his own claim, because of its being claimed by some other person. I do not think it is the intention of the law to permit a man to file on a claim until he is in actual possession of it. That is the law now. I am in favor of a law to make claimants pay upon any sort of mining claim. I would limit the time under forfeiture. I think the size of the ground for dumpage and mills should be increased. Many men are compelled to beat around the bush in order to obtain sufficient ground for dumpage and mill-sites. I think all mining recorders' districts ought to be abolished, and that only one general United States law should be the governing law. I think all mining grounds should be settled upon before any patents issue. They are supposed to do so now, but they do not. I think there should be an inspector for all these surveys, after they are made and before the parties doing the work are paid. I think the classification of the mineral land can be done better. Lands which are now called mineral are non-mineral, and settlers are put to the expense of proving the non-mineral character of such lands. I think in case of any doubt whatever let them go into the mineral classification, but if some method could be provided wherein all settlers in any township or any given part of a township could come, and in some cheap and easy method make one publication in order to prove the non-mineral character of the land, it would be well; and when it is once declared non-mineral they could all file on it as such.

There are lands in the center of Deer Lodge Valley where there is no showing of mineral whatever. They are withdrawn from the market because they are classed as mineral land.

The eastern portion of townships 614 and 714 near Phillipsburg is mineral, but it is settled upon as agricultural. This has got in a measure to be obviated by having a better class of men for deputy surveyors.

I have observed the survey of land closely, and favor the retention of the rectangular system to survey the land. I would suggest that better monuments be used, because the stakes are often quickly destroyed. I will cite a case of bad surveying. On June 15, 1872, I preferred charges to the surveyor-general, Mr. Blaine, against the deputy surveyor, who had executed the agricultural surveys in Deer Lodge and in Missoula Counties. There was no allowance of the convergence of the meridians on that section line between townships 8 and 9 north, and range 9 west. There is an offset of three or four chains where it should have been half a mile or more. It is shown on the map that Deer Lodge River goes down township 8 north a quarter of a mile east where it enters township 9 north. The Deer Lodge River actually goes out of township 9 north, one-third of a mile south of where it enters 9 north, 10 west. The Little Blackfoot River comes within the first-named chain half a mile south of where it enters the last named township. I cited other small discrepancies to the surveyor-general, charging there was good land to the topography in township 9 north, 9 west, and in 9 north and 8 west, 9 north and 13 west, but no attention was paid by the surveyor-general.

Then I preferred charges against the surveyor-general to the Land Office at Washington, and they were returned with an indorsement that the charges were not worthy of consideration. This indorsement was put on by Mr. Dallas, of the Bureau of Topographical Surveys. Mr. Curtis requested me to wait until Mr. Drummond returned, and he promised that a general inspector would be sent out, but it was not done. Three years ago I asked why this had not been done, the reply was the only man who was reliable enough to send was then in Oregon. I then carried the matter to Helena, but pending an investigation Mr. Blaine resigned and nothing was done.

The settlers in this township were never able to make their filings upon this land, and at my advice most of them never entered their lands. There is evidence from citizens that they did not know where their lands were, owing to the bad condition of the surveys. Only one man of those who had filed on the land found himself actually in possession of the land he intended to occupy. He was one out of 13 settlers. This survey was made by William H. Baker, October of '70, and subdivided in December, '70. All the surveys made now by Mr. De Lacy are good, and I think they are all right.

The monuments of surveys ought to be of permanent character. The laws and regulations and instructions now demand that, but the laws are not complied with. If the surveying instructions are complied with, that is sufficient. I think it will be a

good idea to place at every township corner a permanent monument of some kind. Mr. Kellogg, United States deputy surveyor, told me that he had run twelve miles before he found a corner. The settlers along the line of the river in this township, 9 or 10 west, paid him $300 to find their corners for them.

Question. What effect has irrigation upon the bearing capacity of the land?—Answer. It depends upon the situation, measurably, whether the capacity of the land is increased or decreased by irrigation. Where there is a fine loam, with clay and gravelly subsoil, it is ultimately injurious; where there is a deep loam and clay subsoil it is good. It takes less water where the soil is good. Water rights are held almost exclusively by possessory title. I do not know exactly what the law is in respect to water rights. I think it is very chaotic both as to mining and agricultural. About two-thirds of the water can yet be applied to the irrigation of land by a system of dams in the mountains. By such a system the capacity can be at least doubled. I think there ought to be some general law passed by Congress in relation to the matter of irrigating and every facility offered the citizens for the development of irrigation, but I am not in favor of a national system of irrigation. I think some law ought to be passed by which title to the pasturage lands can be acquired on easy, nominal terms. Mr. Concourse, a large cattle owner, says that on an average the pasturage lands in Deer Lodge County are worth to him $1.25 per acre. He and his brother entered 640 acres under the desert-land act, and if there was any law by which he could do it he says he would enter 5,000 acres of land—that is, of land adjacent to that he now possesses, which I think is better than the average. I think the entry of one entire section ought to be allowed for pasture purposes. I do not believe in selling these lands in unlimited quantities, because I think the pre-emption and homestead entries should be continued for some time longer. I hardly think this land is worth for pasturage purposes $1.25 per acre, but if I had the money I think I could find a body of contiguous land, 10,000 acres in extent, of what is called arid land, in Deer Lodge County, that I would pay $1.25 for.

Under the infamous railroad grant we are cut down to each alternate section at a cost of $2.50 per acre, and that makes it $400 for a homestead, and the fees to make non-mineral proof, &c.

Agricultural entries in each case cost a man about $70 or $80. I think the publication of notice is the most ridiculous thing in the world. In the notices there is no time given when the claim is to be made, so that it is really no notice to a man to issue a protest. I think a man should have a right to protest after the entry is made, before proving it and before the patent is issued. I think one land office at the capital (of the State or Territory) would be sufficient, with some modifications. The proving might be done somewhere else, except the pre-emption affidavits. I think a man ought to be allowed to prove up without going to the land office.

The attention of Congress should be called to our terrible situation in regard to the Northern Pacific Railroad claims here. For ten years one-half of our land has been withheld from the market, and our citizens have been compelled to pay double prices for the remainder. Eighteen sections are given to the railroad and two for school purposes, which leaves only sixteen sections in a township open to pre-emption and settlement. This works great detriment to the settlers, and a person filing a declaratory statement cannot cross a township section line because of the railroad grant. It will be better if all railroad land were shifted to one side of the railroad, so as to make the government and the railroad lands each contiguous. If the charter of the Northern Pacific Railroad is extended, it should be upon the condition that this land pass into the charge of registers and receivers, and let them allow cash entries on these lands at a price not to exceed $2.50 per acre, and when the railroad has complied with their promises let the money realized from the sale on these lands be given to the railroad.

I think there ought to be more expedition in the issue of patents, both in mineral and agricultural claims. I think the fees of the surveyor-general's office are too large, as a man filing on timber or agricultural claims would not have to pay so much. I do not think that mining claims should be excepted. There ought to be something definite. I would suggest that the money be refunded to the claimants when they obtain their patents for mining claims.

Testimony of John Caplice, Butte City, Deer Lodge, Mont.

JOHN CAPLICE, of Butte City, Mont., testified, September 28, 1879, as follows:

I have heard the previous statement of Mr. O'Bannon, and concur, except that I favor the recording of mining claims in the district land office, and think two years a sufficient limit for paying up.

Concerning the old claims I find injustice in the present law. My mining difficulty

They could administer the laws better than an outside agent. There is a much larger scope of this country that is capable of agriculture than is supposed. My impression when I came here was that a very small part of it was fit for agriculture; but the prospectors in the south and west are showing up considerable areas of arable land.

Q. How would you prevent this land from being taken up as pasturage land at a low price?—A. I would reserve the arable portion from private sale and dispose of it under the homestead law. I would abolish the pre-emption law.

Q. Why?—A. Because the homestead law has a pre-emption feature in it already.

Q. How could you classify the land?—A. That could be done by the deputy surveyor and the geologist, who should be appointed to go along to classify the land.

Q. And how could you determine just what was irrigable land?—A. Wherever there was water accessible the surveyor would know that so much of the land near by was irrigable.

Q. And how could you make a practical division so that these gentlemen here by looking on this map would know what is irrigable and what is pasturage?—A. From the information collected by the surveyor in making his plats I would have the draughtsman simply note—say, here is a section—I would have him note that this 40 acres is arable, at $1.25 per acre; this 40 acres is timber, of commercial value, so much per acre for that; and that 40 acres is, perhaps, grazing land, and another 80 acres may be arid or be mesa land. In subdividing they run around the entire section, and they can form a pretty good opinion of the entire section from the observations they then make.

Q. You would have this classification made by the deputy surveyor and the geologist appointed to go along with him, who would measure the streams, and determine how much water there was in them annually, and then mark the limits to where the water could be carried?—A. I think he could determine that approximately by his eye. If he made a mistake and it is not arable, still I should classify it as arable, for there is a probability of its being so. I require them to measure the streams now, and their notes show everything—the depth, height, &c.

Q. Suppose it should turn out that there is not water enough for all this land that you have determined to be irrigable, and you sell it to citizens of the United States and it turns out afterward that there is not enough water?—A. Well, it is their lookout. If they buy something and pay $1.25 for it, and it does not turn out as they expected, it is their lookout.

Q. But you classify the several pieces of land for the citizen?—A. The citizen should go and make an examination beforehand.

Q. If the government undertakes to sell a piece of land as irrigable the government ought to know whether it is irrigable or not, and it takes the money of the citizen under the supposition that it is irrigable, does it not?—A. They do under this system.

Q. Suppose a man buys land low down on the stream as irrigable land, and pays for it; along comes another man who buys land higher up and takes all the water. How would you arrange that?—A. That is something I have never thought of.

Q. What is your present law of water rights here? Does the first man who occupies the land take all the water, returning such as he does not need to the stream again?—A. Yes; that is the local law here, I think.

Q. Do you think that there will be any difficulty in adjusting these conflicting interests and conflicting rights?—A. There might be eventually, perhaps, something of that kind. You cannot have any general law that will not operate harshly in some instances. When the government makes this classification of land I go down there to make my settlement near the mouth of a stream or valley. I take my chances of settlers coming in above me and absorbing a good portion of the water. That is something I don't think you can regulate. You can only have a general rule, that the water shall not be wasted.

Q. Why should the government not sell a man the water right, when it sells him 160 acres of irrigable land? It is known how much water is wanted for a certain quantity of land. Why not let this water right run with this land forever? If the government finds that it has not enough water in the stream, let them stop selling the land as irrigable land, and sell the balance as pasturage land.—A. Perhaps that would be a good idea. I have not given that subject any consideration, and can only jump at a conclusion.

Q. Do you think a general system of irrigation ditches could be constructed in this Territory with profit?—A. I think they could in some sections—on the Pecos and Rio Grande Rivers. There is an immense area that can be irrigated there.

Q. Does it destroy the land, or improve it?—A. Irrigation improves the land; it enriches the soil.

Q. Does it increase or destroy the growing capacity of the land, year by year?—A. That I cannot say. They have raised here, for years and years, crops, without fail and without fertilization.

Q. Don't the grazing capacity of the land decrease, year by year?—A. That depends on the size of the herd.

assessing these lands, to make them pay at least a tax on the land on a basis of two dollars and one-half an acre, so that they would either perfect the title or abandon it, and thus give some one else a chance. Unless they are made to pay in some way or other they will hold it for an indefinite time. I know of two cases where tracts of 160 acres each were taken up under applications for placer claims and used for agricultural purposes. They were not mineral; there was no mineral on it at all. If they had made application for these lands as agricultural lands they would have had to prove up, which they did not have to do in their placer-claims application.

I think all mineral claims should be filed in the district land office, and the record be first made there; that is the very best place where it could be done. The title would then be always perfect and could not be manipulated. I believe in square locations.

Testimony of William Davenport.

WILLIAM DAVENPORT testified, September 27, 1879, at Helena, Mont., as follows:

I have lived here since 1864. I am engaged in the sheep and cattle business. My herds are in the Sun River range, about 70 miles from here.

As to the destruction of the grass by sheep, it all depends upon how close they are compelled to feed. If they are limited in their range, they feed the grass so close that they kill it. I have from twenty to twenty-five hundred cattle and from seven to ten thousand sheep.

As to the quantity of land it will take to feed a beef, I cannot say accurately from my knowledge on that point; but I think it will take to feed a beef about 30 acres, and I think five sheep are equal to one beef in the matter of feeding. I have never made any particular observation in regard to the matter.

The way we arrange our grazing is this: we bring our sheep up on the home range until the winter season is over, and we leave it as soon as the grass comes in the spring, and then we shift the range. Our sheep graze, say, over six miles over our winter range; that would make about six miles square that our sheep graze over; that is, a herd of 3,000 graze over these six miles square. It takes about that amount of grazing land to keep these sheep well. We feed them hay sometimes. I have cattle, but do not keep the cattle and sheep together. If I confined my sheep more than that, it would destroy the grass in time, and if you keep the sheep on that range year in and year out it would destroy the grass. That is not so much the case with regard to cattle, and this is the argument for large ranges.

There are some conflicts between cattle and sheep men, and eventually they will prove very disagreeable.

I think these grazing lands ought to be sold and a title given to the stock owner. I would sell it for ten cents per acre, and give a man all he wanted for his cattle herd. I would sell the land in proportion to the amount of stock a man owned.

I think the actual settler ought to be protected, and that this land ought to be divided up into some kind of shape that would protect the small cattle owners. I think it would be well to have a pasturage homestead law. There is just this point in regard to the agricultural and grazing lands. There is a very small proportion of land in this Territory that is suitable for agricultural purposes. There is ground enough, but there is no water to irrigate it with.

There is an immense amount of grazing land in this country. The whole Territory is covered with grass. These lands are not fit for anything but grazing. I think the government would be benefited and the people themselves by acquiring title, so that they could make permanent homes in the Territory. The government would then derive some revenue from the sale of this land, and the result would be a permanent, healthy growth of the country.

The greatest need we have here is people.

I have no idea how many cattle there are in the Territory, but I think that the wealth of Montana will consist in the future of the stock-raising interest.

My opinion at present is that agricultural pursuits, raising grain, &c., do not pay in this Territory. I think if these grazing lands could be settled up that then there would be consumers for the products of the agriculturist. I think the rainfall is increasing slightly here, but not enough to amount to anything. I don't believe in waiting for any climatic changes to settle these matters.

I cannot say anything about the timber lands, for I do not know anything about them. I think the wealth of the country lies in the bunch-grass. There is no real water system; it is too chaotic. All the lands used by stockmen are held by common consent.

Testimony of A. J. Davis, Butte City, Deer Lodge, Mont.

A. J. DAVIS testified at Butte City, September 29, as follows:

I have lived in the Territory since 1864, off and on. I have lived in several counties. I think the mineral and pasturage interests are the two greatest interests of the Territory.

Agriculture, so far as the home market is concerned, is of course of considerable interest; but when we get two railroads here to ship products to the East, we will find we cannot compete with other States and Territories.

I do not think more than one-twentieth of the Territory could be irrigated; probably one-tenth is timber, but in the eastern portion of Montana timber is very scarce, while there are valleys which are remarkably heavy with timber. I think these timber lands ought to be held by the government, and allow every person to go and use the timber for domestic purposes.

I would allow a person to use the timber for domestic purposes that would tend to the improvement of the country, without purchasing it, and without licensing people to go on the timber land.

If there is to be any jurisdiction over the timber lands, I think the register and receiver would be the person to have that jurisdiction. If the government concludes to sell these lands, I would sell them in tracts not to exceed 160 acres, without it was to parties who consumed large amounts of timber in the way of mining interests and saw-mills.

My idea is to protect the actual settler here. In selling the timber the price should be regulated by the quantity, and the price should hardly exceed $2.50 per acre. Many portions of it would not be worth more than fifty cents per acre.

I do not think there is much destruction of the timber now by fire. Fire is the worst cause of its destruction. There is less fire now than formerly. I think one-half the timber could be trimmed out with more profit to the remainder. I think if the fires are kept out of the timber it will grow, and it would be a good idea for the government to retain every alternate section if they propose to sell it, though I think it would be the better way to let the timber remain as it is. If it were all cut off I think it would grow again large enough for mining and farming purposes, such as fences, &c., in forty or fifty years.

I have noticed the rainfall, and I think it has increased. I do not think the openness of the climate has increased; I think it has been milder for the last few years.

The great body of the water comes here in the spring, and for the last few years it has been at a season of the year that has enabled us to raise crops without irrigation. We have had in the last three springs a great deal of rain. In many instances the rain has fallen at the time needed for the raising of crops. I think it would be better if we had some national law by which we could take out large ditches, and the government should offer a consideration for the encouragement of this industry. In Jefferson County, and a portion of Lewis and Clarke Counties, there is a large portion of land, some of it very valuable bench land, that might be irrigated by making extensive canals. It depends upon the soil whether the water will destroy the quality of it. If it is a subsoil, it injures it; if it is a clay, the water is held. I do not think it is any use to base any hopes upon an increase of water in Montana.

Four-fifths of the Territory is properly arid land, and for men of limited capital probably the pasturage homestead may be a benent; but for persons of large capital who have 10,000 head of cattle that kind of a homestead would be of no use. At the same time a man who has a large herd of cattle wants some protection, and I would not sell these lands. I think the government had better hold them to lease them.

Give a man a right to use this land in proportion to the cattle he has, for a term of years with the privilege of renewing that lease.

If these lands were sold, I think either from 8 to 10 cents per acre would be an ample price for them. Of course there are some choice spots that would be worth more.

It will take on an average 20 acres of this land to sustain one beef, and in a very few years if you pasture this bunch-grass closely it will decrease. The seeds are eaten off and the growth is retarded. If a man has a large tract of land he could increase his range by moving his cattle at stated times from place to place, so as to prevent his bulls serving his neighbor's cattle, and the quality of beef would be improved. As his herds increased his land could be increased. Montana is not one-tenth stocked with cattle yet. Something should be done in this matter before the people begin to come in rapidly, and I think the sooner it is settled the better, and the mining districts are a convenience to the miners. It saves them the traveling, while it would be safer to make the final record in the district land office, because if a copy of the application or registration is forwarded to Washington if the records are destroyed here they have got them there. I understand that the records of the Summit Valley mining district, in which are situated all the mines of Butte, are all destroyed. They were

kept by a mining recorder in the mining district, and I understand that there is a number of mining patents in Washington that will not issue until these records are found. I think the present United States law in regard to surveys is sufficient. There is one amendment I think would be well. Where two claims are adjoining and parallel there are sometimes little fractions between the two mines. If one party has secured his patent or made his application I think the second party ought to have the right to come up to the first party's lines and take in the small fragment. The government sells that land, and it has often been a channel of great annoyance. The present expense of getting a patent is very high. The miner pays $5 per acre for a mine, while the agriculturist pays but $1.25. The latter has also his land surveyed for him and he pays nothing for his application, while the miner pays $30 to the surveyor-general, and the other charges are also very high. It costs in the neighborhood of $300 to pay for the survey and make his proof. I think the cost of survey, wherever it is done, should be deducted from the cost of the land, and I think there should be more deputy mineral surveyors. Every district of any importance should have one. These mineral surveys are very fairly done.

C. T. MEADOR. I would like to make a remark concerning square locations. The square-location proposition would be suicidal. If the government would allow us to take as large an amount of land as the Spaniards did, we might be willing to take the square location; but most of the improved mines in the Territory would go out of their side lines at 1,200 feet. That is the case with all of the best mines at Trap Hill.

JOHN CAPLICE. And if you make a square location you destroy the mining interests. Just as a man puts up expensive machinery he runs out of his side lines, and he is cut off by some other man who pre-empts a claim next to him. Take the Alice mine, for instance; you go down that mine and you will see long parallel veins or seams of ore which are 50 feet apart and all of the same size. Under the square location a man might be entitled to a dozen mines at once.

A. J. DAVIS. The present law seems to be a very good one, with one exception. I think we ought to be entitled to follow the dip of the vein, but the law as regards spurs and angles ought to be the same as it was under the old Mexican law, which cut off the spurs and angles. I think the law ought to go back to what it was before. The old law was better in that respect than the new one. If that were done, I think our law would be as good as there is any necessity for. I think the present law ought to be modified in regard to mill-sites. Under the present law you cannot take up a mill-site without proving it to be non-mineral. That is almost impossible. Take the land here for over ten miles and you will find some mineral deposits throughout the country. You cannot go anywhere, scarcely, without finding mineral of some kind, although it may be in very small quantities. Hence you cannot swear it is non-mineral. I think the only requirement the government should make is that there shall be no mineral of any value on it. I think there should be more than 5 or 10 acres—there should be 40 or 50 acres—for this reason: if a man is confined to 5 acres, that is not enough to stack his ore on and build his warehouses, &c. If you have 40 acres you can place your buildings at proper intervals and have a place for your tailings, &c., and keep other people off. If all such subterranean rights were retained by the government, it would remedy the defect. Of course in mining underneath such land it must be done subject to the vested rights of the mill owner. I think there ought to be a period fixed by law within which the miners should be compelled to pay up on their placer or lode claims. I should fix that period at two years. A large amount of valuable land is simply held by speculators, without working, and this is much to the detriment of the country. This sort of thing has greatly injured Montana.

C. CLARKE. If a man pays up for his mine, I do not think he should be compelled to "represent." There was a decision of the courts on that point, but it is generally understood with men who have valuable property that rather than run any chances they had better go on representing. The law should be so amended that when a man pays for his land and gets a receipt from the register and receiver, that such receipt should be as final as if it were a patent, and he should not be compelled to go on representing afterwards. The law is ambiguous as it is, and while the officials decide one way the courts decide another. The miner should not be compelled to take any chances on it. The mineral law says that there shall be representation until the patent is issued.

A. J. DAVIS. I think that there is a great deal of unnecessary delay in patenting. I think these patents should be issued sooner, and I think they ought to issue them without requiring the payment of $25.

C. P. MEADOR. If I send a fee to a lawyer in Washington I get a patent right away; but if you do not, you wait two or three years.

A. J. DAVIS. A gentleman told me that he followed his papers to Washington and got there just after the papers arrived, and in twenty-four hours he secured a patent.

C. CLARK. There is a patent in the office at Helena that has only just arrived after two years, and yet the papers were all sent in properly and straight.

There is another point in connection with this matter of mineral patents. The Land Office has decided that a claimant can't make continuous proof by an attorney in fact.

I was away last summer and my brother, who was my attorney in fact, transacted some mineral business for me, but they returned all the papers to me to be corrected. After the location has been made by the person himself, all other matters should be allowed to be transacted by the attorney in fact.

A. J. DAVIS. I see no reason why the Commissioner of the General Land Office should require three certified copies of location, and I think the registers and receivers of the local land offices and the surveyor-general should have seals to put upon their official papers.

Question. What is the law concerning the water rights here?—Answer. I think there is a statute concerning the water rights but it does not amount to much.

I think all contests up to the point of obtaining patent should be heard and decided in the district land office. This would be a protection to the poor man. There is no reason why mineral contests should not be decided in the district land offices, where homestead and pre-emption contests are settled. Of course this should not destroy the right of appeal from the decision of the respective officers.

The yield of the camp has been between two and three millions since it was struck and I think averages about $125,000 a month; I think it could be increased to about a million a month. All the titles of this camp which have been recorded in the office of the mining recorder have been lost. I have to send forty miles to the mining recorder's office and it would make no difference to me if the records were kept in the district land offices, I would just as lief send to Helena, Mont. Many mineral claims have been filed on fifteen or twenty times. This mineral recorder's office does not prevent this, but the district office would, for the government officers would not allow one filing to be made until the previous one had been voided.

The following gentlemen being present concurred in the statement of Mr. Davis: C. T. Meador, mine owner; N. Armstrong, mine owner; C. Clarke, mine superintendent; W. A. Clarke, mine owner; D. M. Evans, superintendent Lexington Mine; P. Largy, mine owner; J. Rosenthal, mine owner, and J. Caplice.

Testimony of Ralston Deegan.

RALSTON DEEGAN, Helena, Mont., testified, September 25, 1879, as follows:

I have lived here since 1866. I am in the cattle and stock raising business. They range in the Spokane range of mountains. I think it will take back in the mountain ranges 20 acres, and in the lowlands it will take 30 acres to raise a beef.

The water rights here are pretty well taken up. In this vicinity it is overstocked, but in the northern counties it is not overstocked, and this is a very good sheep country. I think that about five sheep will equal one beef. This I consider a fair average. The ranges decrease by feeding, because the cattle do not permit the grass to head and the seed to fill. We have here buffalo grass, and blue joint and red top.

If a man were permitted to own his land, he, either by herders or actual fencing, could then guard his ground and sow grass. I think the wild grasses are much the best and strongest for cattle, but if cattle could be allowed to rotate I think it would be better for men to own their own land. I think these grazing lands ought to be sold at a low figure. I like the pasturage homestead idea very much for the small dealers, but I think the larger ones ought to be allowed to purchase in excess of the pasturage homestead, in proportion to the amount of cattle they own. I would allow the actual settlers to have the preference. I think in the hills there is a portion of the land which is grazable and on some land there is no grazing at all, say one-third of it. I would take 10,000 acres at 10 cents per acre; that is as much as I would want in this country. This country is only fit for pasturage, mining, and timbering purposes. It will never be anything but a grazing country. A country that requires irrigation will never be a very extensive agricultural country.

Wheat is sold here for 50 cents per bushel and sometimes for less. There is no money here in agriculture; you take new land here and you raise a crop for one or two years, and then it is all played out. I took up a claim here last summer; it is entirely surrounded by water. It is so low that three months in the year the mosquitoes and flies are so bad that one cannot live there, and in such a place as that you cannot raise anything—not even a potato. It is only fit to cut hay off of. I filed a homestead on it, and I think I should be allowed to make final entry; but the land office ruled that as I had not lived on it five years I cannot make final entry, although everything is all right. This land was not surveyed but I had it surveyed at my own expense.

Testimony of C. Edwards, Bozeman, Gallatin County, Mont.

1. C. Edwards, Bozeman, Gallatin County, Montana, breeder of sheep, cattle, hogs and poultry; am a farmer.
2. More than fifteen years.
3. Have acquired title to 320 acres, 160 each by pre-emption and homestead.
4. None aside from my observation in this Territory.
5. Don't think I understand the purport of the question. Final proof is made in conformity with the law under which the land may have been entered, and from one to two years may elapse before the applicant receives a patent from the General Land Office; the distance necessary for applicants and witnesses to travel from some sections to the land office in this Territory makes the expenses quite heavy.
6. Think in some instances if applicants and witnesses had been more conscientious patents could not have been obtained. Cannot suggest any alteration of the homestead or pre-emption laws that would remedy such abuses. Think the desert-land act objectionable in every respect, and believe that the best interests of Montana demand its immediate repeal as far as it affects this Territory, for the reason that any land that can be taken in conformity with the desert-land act is equally available for pre-emption and homestead entry.
7. The lands of Montana may be divided into timbered lands, agricultural, pastoral, and mineral.
8. Do not feel competent to offer any suggestions.
9. The present system of subdividing land into 40-acre lots is in my opinion as good as could be adopted. The requirement of non-mineral-character proofs in some sections makes unnecessary expense to the claimant, but I could not suggest a remedy.
10. I don't think the present homestead and pre-emption laws can be improved, and I am decidedly of the opinion that the best interests of the masses of the people and of the general government are best subserved by restricting the acquisition of titles to public lands to the present homestead law, or some laws similar in character, for the reason that in my opinion the parceling out of the public lands in a manner that will afford good homes to the largest number of families is directly conducive to the best interests of the nation. Montana has large tracts of land that are now used only for pasturage that in the near future will no doubt be converted into homes by thrifty, enterprising settlers, who will be content to pasture stock during the summer on free pasturage and feed them during the winter; and if these tracts of country are held by the general government until they are taken under existing pre-emption and homestead laws, they will make of Montana a more populous and wealthy State and yield a greater revenue to the natioual Treasury than they possibly can if disposed of in any other way.

AGRICULTURE.

1. The climate is considered arid, but more water falls here than in many portions of the plains and mountain counties of the West. Rainfall in Montana ranges from 21 inches to 25 inches. The average rainfall of the greater portion of the Territory is, as near as I can learn from the most reliable data, between 23 and 24 inches, and has never fallen below 21 inches during the last twelve years; this includes the snowfall, and the relative proportions of each I am not able to state.
2. We have rain in April, May, June, July—the greater portion in May and June. There is seldom a year that rain falls sufficient in July to fill spring wheat; but the opinion is growing in favor that fall wheat, sowed in August, will yield big crops on the most of our bench lands without irrigation.
3. Comparatively speaking a very small proportion of the entire area.
4. It would be difficult to state with any degree of accuracy.
5. Wheat, oats, barley, corn in some sections, potatoes, onions, cabbage, beets, turnips, and a large variety of vegetables in general.
6. The amount actually necessary will vary in accordance with the lay of the land and the character of the soil. I have never studied the subject closely enough to define an answer in inches. I am of the opinion, however, that the average farmer of Montana at present uses less than "a cubic foot per second" (see report of Maj. J. W. Powell in charge of United States Geographical and Geological Survey of Rocky Mountain Regions) in a great many cases.
7. Tributaries of the Missouri and the Marias, and the tributaries of the Columbia that rise in Montana.
8. Have raised crops by irrigation for fifteen years in Montana; don't think the soil is injured by irrigation. Our highest farms are about 5,200 feet above the sea.
9. Ordinarily all of the water that runs into the field in the ditches stays there until it goes out by seepage into underground channels or by evaporation. The laws of Montana would seem to grant to the appropriator of the soil for agricultural purposes the use of water for irrigating, to make such land available for the purpose of agriculture

to the full extent thereof, giving preference in all cases to the priority of the claim. I don't think I comprehend what you mean by "waste" water.

10. In the sections of the Territory where farming is most extensively carried on the water of the smaller streams, which is most easily utilized for irrigating purposes, has generally been appropriated by settlers to its full capacity. Governed at first by local laws, which have since been embodied into statute law.

12. Can't say. Much of the land now used only for pasturage in my opinion, which is based upon practical experiment, will raise good crops of fall wheat without irrigation by using a subsoil plow.

13. Not advisable at present. Montana is too new, and too small a part of the lands that will make good homes for the masses of the people have yet been taken.

14. No, it is not.

15. Some stockmen with whom I have discussed this subject think that it will require about 12 acres. But we have never yet been compelled to give this subject much thought on account of the vast amount of grass and comparatively few stock. This applies to Montana at large.

16. Stock cattle are worth about $14 per head, and it is estimated that the average return from a herd is about 25 per cent. per annum.

18. Diminished.

19. No. In some sections they can be confined. Any range, as long as it is a good winter range, might as well be fenced as otherwise.

20. Can't see that it would.

21. The Gallatin and Yellowstone Rivers and tributaries.

22. About eight or ten.

23. Diminished.

24. Yes.

26. About 20,000. Can't say about cattle; they are not herded. From 15 head to 4,000 head in a herd.

27. That the government disposes of its lands only under the present homestead and pre-emption laws, which now nets a clean profit of 9.3 per acre clear of all expenses (New York Semi-Weekly Tribune, November 18, 1879, page 10), and provides full and ample protection to every citizen in the peaceful enjoyment of life and property. This policy adopted and rigidly pursued will develop the mountain wilds of Montana into a wealthy and populous State.

28. Yes, a great deal.

TIMBER.

1. So much that it is hard to say—fir, pine, spruce.

2. None worth mentioning.

3. In the most of the valleys in Montana a very narrow strip of timber along the foot of the mountains is all that is any way accessible; a few acres of this might be sold, but, in my opinion, would have a tendency to retard the settlement of the valleys, except perhaps in some portions of the Missoula Valley. I cannot suggest any plan by which the prospects of the general government would be brightened in the sale of timber land in any of the inland mountain Territories.

4. I would let them alone just as they are.

5. So far as I have noticed (my observation is not limited on this point) there is a second growth, of the same character as has been chopped or burned off; its growth varies in different lands.

6. Forest fires are almost unknown since the whites took possession of Montana. My own inclinations are to the belief that they are the result of carelessness by campers either whites or Indians, for the most part, although I have no doubt that in some instances they are caused by lightning.

7. There are no railroads in this Territory for domestic use. The difficulty of getting timber out of the mountains is such that generally what is not fit for building or fencing is used for fire-wood, and as far as I have observed I feel safe in saying that there is less waste of timber here than in some of the States.

8. We go and cut timber when we want it wherever we find it to suit our purpose best; I have known of very few instances of timber being cut to hold it, and that has been in an excitement at a new mining camp, but in no instance to any great extent. Timber once felled is supposed to belong to the party who chopped it, and his rights are generally respected until it would seem evident that he has abandoned it.

9. Don't think any benefit would be derived from it at present.

C. EDWARDS,
Bozeman, Mont.

Testimony of Wesley P. Emory, miner, Butte City, Deer Lodge County, Mont.

To Public Land Commission:

I beg leave to submit the following answers to some of the questions propounded by you. Questions answered under the different headings will be named and numbered.

1. Name, Wesley P. Emery; residence, Butte City, Deer Lodge County, Mont.; occupation, miner.

2. County, five years; Territory, sixteen years.

3. Yes. A quartz mine. Under the United States mining laws.

4. What I have seen and the experience of others.

5. From my own knowledge and the actual experience of others, from three months to four years for an uncontested claim for quartz or placer, depending on whether an attorney is paid to hurry up the claim at the General Land Office at Washington. For a contested claim the time depends a good deal on the courts and is indefinite. For a quartz claim on surveyed land, from $140 to $175 and the entry fee of $5 per acre for the amount applied for. For placer on unsurveyed land, same as quartz on surveyed land and entry fee. For placer on surveyed land by legal subdivisions, $60 and entry fee of $2.50 per acre for the amount applied for.

6. Yes. The desert-land law should be repealed and the lands only disposed of to actual settlers; under it the best land in the country is being taken up, both grazing and hay land, and the land is not settled on at all in most cases, and the result is a large tract of land held for speculation. In all cases that have come under my observation so far, small streams of water which flows naturally through the land is diverted from the stream for a few rods and application made for patent as reclaimed desert land.

7. Valleys, bench lands or foot-hills, and mountains. Valleys are farming lands; foot-hills, grazing and mineral; mountains, timber and mineral.

8. Agricultural are easily classed. Mineral land can only be classed by a thorough scientific examination wherein pick and shovel must be used.

9. Timber land should be surveyed in small tracts, and the quality and quantity of timber reported on by the surveyor or some person appointed for the purpose, and the timber sold in tracts not exceeding 20 acres; but the land on which the timber grows should be reserved to the United States, with the privilege for miners to prospect or mine on the same, and, after a period not exceeding fifteen years, the timber left standing should again vest in the United States and should never be sold again except to miners who shall be in actual possession of the ground and have a *bona-fide* and paying mine. Or perhaps a better plan would be to charge a stumpage that should bring the United States an average of not less than $2.50 per acre for the timber land from which they cut the timber, and the title still be held by the United States; and in view of the fact that timber that will make lumber is very scarce in some sections of the country, saw-mills should be charged by the thousand feet. But the plan that most of the people would prefer is for the law to remain just as it is. Pasture lands, if surveyed and sold or offered, would be slow sale except in the vicinity of some prosperous town, and if sold in any other sections the result would be to shut out poor people who were unable to purchase large tracts of land so they could scarcely keep a cow, while large stock dealers, who would be the principal purchasers, would require from six to twenty thousand acres to accommodate their vast herds, and I think the system would result disastrously to the speedy development of the Territory. No, I don't think the system would be a judicious one, and as to leasing them, I believe it would be worse than their sale. With the desert-land law repealed, at least so far as Montana is concerned, I believe the present land-parceling system is as good as can be desired, except in regard to placer and quartz, of which I shall speak further on; but will take the liberty to state here that before the government commenced to survey and sell the mineral lands the country was more prosperous, as about two-thirds of the mining claims are shut down as soon as patented.

10. I know of no better method than the one now in use, except as stated above, and in regard to quartz and placer, of which I shall speak under that head.

AGRICULTURE.

1. Climate dry and cool in summer. Rainfall from April to November from 4 to 8 inches. Seasons, spring from April to July, pretty well mixed with snow and icicles sometimes. Summer from July to September, and fall lasts until about the 1st of December. First snows usually about September 15th. Snowfall in winter from 4 to 14 in the lower valleys and 2 to 7 feet in the higher mountains.

2. May and June. Irrigation season from May to September. Most need of irrigation, July.

3. None worth making a note of.

4. About one-tenth.

5. All except hay.
7. Mountain streams fed by springs of never-failing water. Supply good, but a little expense must be incurred in some cases to raise some of the larger streams.
8. The fertility of the soil is not injured only when washed away, but is improved if any changed. Good crops of wheat, oats, barley, and potatoes, and all kinds of garden produce except vines, such as tomatoes, melons, squash, &c., which will not grow here at an altitude of 5,800 above the sea.
12. About one-tenth.
13. Impracticable as it requires on an average about 10 acres to keep an animal one year, and in some cases twenty-five would not do it.
14. Not advisable; and if put in market the quantity should be limited.
18. Diminished.
19. No; only their hay land.
20. No.
23. Diminished. The native grasses in this country will not stand much grazing.
24. Cattle will not graze with sheep nor on land where sheep have grazed lately, if left to themselves.

TIMBER.

1. About one-half is timber on the west side of the main divide. East of the divide it grows less and less down to the plains at the base of the mountains. The character of the timber is mostly a thick growth of small pines growing among the rocks and higher mountains, only fit for fence-poles, log-houses, and fire-wood, and not more than the one-fiftieth part of it on an average is fit for saw-mills. A little very scrubby cedar grows among the more rocky places. Besides this a light growth of cottonwood birch, quaking asp, and black alder and willows grow along the margin of the streams. The last mentioned five are fit only for wood and shelter for stock, as it is very scrubby and crooked.
2. Cottonwood and quaking asp are the only kinds planted, and must be irrigated; time of growth fifteen to twenty years in this country for a tree five inches in diameter; they are only planted for ornament.
3. I would not dispose of them at all; but if they must be disposed of do it by lease in small tracts, and to prevent monopoly the number of leases to one man should be limited and non-transferable, and in a certain number of years the lease should be canceled, and in view of the scarcity of saw timber in a great many places saw-mills should be allowed to cut where they please and pay stumpage or by the month, according to capacity of the mill. No lease exceeding 40 acres to one person, and only one lease to the same person in the same land district, but allow him to file abandonment papers with the proper officer at the land office, and locate another at any time. But in all cases the mineral and the right to prospect for the same, and mine on the same, should be reserved for any persons who wish to avail themselves of it. Price should be from two to five dollars per acre, according to quantity and quality of timber.
4. Yes; for reasons given under Question 3, to prevent monopoly and give all a chance to acquire land.
5. Yes, if fire is kept out. Variety same as formerly, and takes from ten to fifteen years for a tree five inches in diameter.
6. They are frequently intentional and often the result of carelessness; they are very destructive in dry weather; they might be checked to a certain extent by fine and imprisonment, but the only sure preventive is a greater rainfall.
7. In this country the timber used for mining and building purposes is scarcely missed, as only a very small portion of the amount of timber growing on a given portion is fit for the purpose. It is only such as is suitable that is taken, and the only waste is a portion of the tops, which is wasted, and much of that is gathered for firewood when it gets dry. It is only in the vicinity of large mining camps where there are mills that forests are much destroyed, and even then the timber on the more inaccessible portions is not taken. This place and vicinity consumes about seventy-five cords of wood daily, and this destruction of the forests cannot be prevented without stopping or seriously crippling the mining interests. The survey and sale or lease or a stumpage law will not stop these inroads upon the forests.
8. The ownership of timber felled is usually conceded to the person felling the same, but if not used in a reasonable time it is sometimes used by others. I speak of timber felled but not cut up.
9. They might be, but they would have to appoint agents to look out for them, and as the persons usually appointed to positions of this kind are generally scoundrels, I doubt the wisdom of the policy.

LODE CLAIMS.

1. I have been in mining countries for nineteen years—about three years in Colorado and sixteen in Montana; have mined mostly in placer, but for the past four years have combined quartz and placer; have had but little experience in mine-surveying, and no personal experience in litigation.

2. Under the present law one person can locate a continuous vein of one mile in length, or five miles if it can be traced so far, by simply giving it a new name every 1,500 feet. This is wrong. No person should be allowed to hold more than two claims on the same vein, and the end-lines of the two claims should not be less than 2,000 feet apart. Then again a person locates a claim and does not represent it before the end of the year; locates it under a new name at the end of the year, and thus holds it for four or five years without doing $100 worth of work on it during the whole time. That is wrong. No person should be permitted to relocate the same ground or any part of it, except he has represented the same, and does it to alter the lines formerly established. Then, again, they are too large. One thousand feet in length by 400 in width is large enough, and should include all veins within the surface, with the right to follow them to the depths of the earth, and the first location to hold when two or more veins come together.

3. If this question has any reference to cross lodes, it should not be done. There should be no cross lode after it comes to the surface ground of a prior location—that is, it should belong to the claim first located.

4. I understand the apex of a lode to be where it comes through or to the surface of the rock in which it is incased, though it may be covered, and sometimes is, with twenty or thirty feet of loose earth. The dip of a vein is usually determined at fifteen or twenty feet below the apex, but sometimes it is as deep as a hundred, depending on the shape of the mountain.

5. They are not properly protected.

6. Where a lead has much dip they sometimes go outside of the side lines and sink a perpendicular shaft and strike the vein, and litigation ensues.

7. No; but two seams running parallel, if near together on the surface, usually come together at some depth.

8. No; but have heard of such cases.

9. I have never seen a true outcrop as wide as 100 feet, but they sometimes terminate abruptly and come in again at from 50 to 200 feet, at a square angle, and come together at great depths.

10. Yes.

12. Have never known a case of the kind, but such a thing is possible.

13. Yes.

14. It is not possible while scoundrels are left at large, but rights of prior location can be better defined and protected.

15. Yes, in several in Montana. Have been where there were as few as seven men and where there were one hundred. All are miners when a mining district is organized. First a president and secretary *pro tempore* are elected; next by-laws are adopted to govern the size of claims and manner of location and representation; then a permanent president is elected to call all meetings and preside at them; then a permanent recorder, who records all claims located, making a description of the same, and who makes a record of all transfers.

16. Usually by number each way from the discovery, and the record holds good as long as the locator complies with the local by-laws.

17. Only when it can be done without interference with another location.

18. No; but if such a case does happen possession is the only security.

19. In this Territory quartz locations are recorded with the county recorder; so they are secure. But as they are frequently forfeited and relocated year after year, I cannot see that much good could result from it; but if some means could be adopted so a patent could be secured for less money, it would be a good move and thankfully received by the miners.

20. No; in a Territory like Montana there are too many contested cases for the local land officers to attend to; but a special judge might be appointed in each Territory, who might be an officer in the land office when not employed in contested cases, with appeal to the United States Supreme Court or the Commissioner. Some of these contested cases are very long, and it would occupy several weeks in each year to dispense with all of them.

21. Make the claims not to exceed 1,000 feet in length; limit the number of claims to one locator within a certain distance of each other; give each locator all that comes to the surface of the bed-rock in the bounds of his claim, and allow him to follow the vein in its dip as far as fire and water will let him, and when two or more veins come together first locator to take all; $500 worth of actual mining exploration before application for patent; wells, cellars, houses, and all movable machinery not to be called improvements only in excess of $500; and I believe that some cheaper method of securing title after the improvements are made might be adopted; but the advertising should not be dispensed with.

22. Yes; five years.

PLACER CLAIMS.

1. If this question is to include lodes, about one-third; but if placer only, I will say that if you take a section of this territory 200 miles square, and make this place the center, that less than 1 acre in 200,000 will pay $1 per day for working.

2. Yes; have made locations, mined, and made application for patent.

3. Possessory title in ten to twenty days costs $3 for record. By patent from three months to five years; costs in fees to the different officers $115, and $15 for advertisement, and $2.50 to $5 per acre additional; and if a patent is to be obtained inside of four or five years, an attorney from $25 to $50, at Washington, who will probably get it through in one year. With contest they are sometimes delayed two years in the courts of the Territory and the cost goes into the thousands.

4. Never had a contest, and this question is answered under question 3.

5. Defective.

6. They are defective in everything. They are a source of perjury, fraud, and blackmail, and an injury to the best interests of the mining countries, and should be repealed. Claims are usually not worked after patented, but are held for speculation. They are often used to apply for patent for ground belonging to other parties, for the purpose of securing some outside ground and getting blackmail enough to pay for all of it out of parties who have a good title to a portion of the ground and would sooner pay the amount asked than bring suit. They are used to try to steal a little good ground from some other parties whose grounds they cannot buy. Under local laws from one to four hundred feet by two to four hundred feet in width is a claim, and if work is not carried on during the summer they are considered abandoned, except the owner is sick or there is no water to work them. Can purchase as many as he can represent, according to local customs, which vary from one to two days in each week for each claim owned. Evidence of title is bills of sale and the books of the local recorder, and no use is made of them, except for mining; and the character of litigation is a suit of ejectment and damages or an injunction.

Yes, the United States placer laws are defective, and I will suggest that if the United States must have a revenne from them that they be not sold as at present, but be recorded in the local land office in claims of not more than 1,000 feet in length, and the number of claims that one man can hold be limited to a certain number in a certain distance, and a fee of $2.50 for each 200 feet square claimed shall be paid to the United States land office at the time of record, and record required in a reasonable time; and the claimant not to hold the ground any longer than he shall place or cause to be placed on each claim a certain amount of permanent mining improvements in each year. Under the present placer law wells, cellars, cabins, fences, &c., are used to prove up on ground, and I know of one application for patent in this district for 160 acres on which not one dollar's worth of mining improvements can be found; and this reminds me of a plan or two that is adopted by applicants: One is to borrow hydraulic pipe and hose and haul them on the ground, prove up on it, and take the improvements off; another is to buy old improvements from some person who never owned them and prove up on the work.

7. Yes; Alfred Dell, 160 acres; Noyes *et al.*, J. Harrington, Jones & Harrington, township 3 north, range 7 and 8 west, Montana.

8. It has been used to obtain patent on ground where a number of ledges were known to exist at the time of making applicatiou; in this district R. D. and J. A. Leggat and L. W. Foster, range 3 north, 7 west; Noyes & Upton, 3 north, 8 west, Montana.

9. No.

CLOSING REMARKS.

In giving the above answers to your questions I have aimed to give them on my convictions formed by a long residence in the mines, and if I have erred it is my judgment. If I have entered too much into details it is because I wished to be understood. I have been more explicit on the mines because more interested, and I have only made suggestions which I believe to be for the best interests of all; and if in this long communication I have given your honorable Commission one hint that will aid you in dealing with this question of the mining countries I am content, and, asking your Commission to remember that to have a mine or a dozen of them is no proof that a man is rich or ever will be, I subscribe myself,

Yours, most respectfully,

WESLEY P. EMERY.

Testimony of Lawrence A. Fenner, miner, Virginia City, Mont.

The questions to which the following answers are given will be found on sheet facing page 1.

VIRGINIA CITY, MONT., *November* 24, 1879.

To the Honorable Public Land Commission, Washington, D. C.:

GENTLEMEN: In reply to your communication I will state that I have been engaged in placer mining in this Territory and Colorado since 1860, and have had practical ex-

perience in all branches of gravel mining; have mined in Alder Gulch, near Virginia City, since 1864. I think that more than one-half of the land in this vicinity is mineral in character containing placers, and gold, silver, and lead bearing lodes, and also a limited quantity of copper, cinnabar, and coal have been found.

I have become familiar with the mining laws of Congress by actual experience in obtaining patents for placer ground, both with and without contest.

In 1875 I made application for 60 acres of placer ground by legal subdivisions. There was no contest, and after publication the acreage was paid, and two years after I received my patent. The total cost per acre in this application was $5.

In March, 1877, I made application for another legal subdivision of 10 acres, adjoining my first application, and subject to the same local laws and customs in regard to possessory title. This legal subdivision was made up of ground which I could not embrace in my application of 1875, and of a purchase made just before application, and claims that were supposed to be abandoned, for they had been represented in no visible manner for many years.

An adverse claim of 2.77 acres was set up by certain parties, who filed protest and plat of survey in the usual manner. After a delay of one year, the case came up for trial before the district court at Virginia City, and it was decided I was entitled to 1.47 acres, and the adverse party 1.30 acres of the original adverse claim as filed by the protestants. The judgment-roll defined by metes and bounds the part to which each party was entitled. I immediately sent a certified copy of the judgment roll and pay for 8.71 acres to the land office at Helena, and got my receiver's receipt in return. The adverse party did not then take any steps to complete their title, nor have they since, but refused to give me power to patent the whole legal subdivision after I had offered them any security they desired that I would reconvey their portion to them after my title was complete. They declared that the only use they had for this ground was to make me expense in obtaining a patent.

Now, after a year and a half has elapsed since my filing judgment-roll, information comes to me that a decision has been made by the Interior Department that I will be under the necessity of making survey and plat in the manner provided for ground not legal subdivisions, this ruling involving an additional expense of $85 or $100, making a total cost for obtaining title to 8.70 acres of over $500. Of course the largest part of this sum went to pay expenses of contesting the adverse claim. Witnesses had to be brought a long distance to prove a chain of possessory title, according to the local district laws, running through a period of twelve years.

As regards my knowledge of the experience of others, I will state that I know of one instance in this vicinity where the applicant suffered from the imperfect working of the mining laws of Congress in the matter of adverse claims, and I know of other parties who suffered severe extortion in order to escape an adverse claim from those who held small claims which had not been worked for years, and which were utterly worthless alone.

In order to show the evils arising from allowing mining districts to regulate the manner of possession beyond a limited period after discovery, I will give a short history of the mining laws of Alder Gulch, and this is but the history of many other gulches which have come under my observation. Alder Gulch was discovered late in 1863 and was divided into several districts. The first local law allowed each person one claim by pre-emption and one by purchase, each claim consisting of 100 feet up and down and from side to side, and in the lower portion of the gulch, where it is very wide, the gulch was divided by the original creek channel so as to form two tiers of claims. The two first seasons after its discovery nearly all of the gulch that would pay by the primitive method of mining, which is the only way small claims can be operated, were worked out and many claims were abandoned. About this time the miners' laws were so amended as to allow each person to purchase and hold as many claims as he could represent by doing two days' work each week for each claim, and soon after the laws were again amended in this (Nevada) district so that it only required a residence of four months each year for a miner to represent any number of claims. In 1866 a new system of reworking these claims in large bodies by means of flumes, hydraulics, and hoisting works was inaugurated—this style requiring work to be begun at the lower line and continued up stream. Then it was that some of these worked-out claims fell into the hands of men who used them only to extort money from and harass the larger claim owners, the local laws making this an easy matter, for, without marking boundaries, it was only required to have record made by number by a district recorder, who was bound in no manner to the faithful performance of his duty. Such was the state of affairs when, in 1875, the large claim owners first applied for patents. Some who held a large body of ground found themselves cut into by a single hundred feet of ground, the owner of which threatened an adverse claim unless unreasonable privileges were granted or an extortionate price was paid him for his ground.

By a ruling of the Interior Department several claims not contiguous may be included in one application, provided $500 worth of improvements were made by the applicant or his grantors on each separate piece of ground.

A company of miners near here in this gulch, having two separate bodies of ground, desired to include both in one application, but were barred from doing so because all the improvements, valued at many thousands of dollars, were on one piece of ground, while the other was made up of several original claims which, after having been worked by the primitive method in the early day and afterward being abandoned, were located again and finally passed into the hands of the present owners for a valuable consideration.

The chain of title from the men who first owned and worked these claims was broken, and the only remedy was either to forego a patent or do $500 worth of "dead work."

Again, it might happen that one of these flume companies after having patented their ground might purchase contiguous ground of the character just described, in which case they would be barred from patent for the same reason.

I know of no instance where a title has been obtained under the placer law for non-mineral land, although I know of one instance where the attempt was made. Within my knowledge the placer law has not been used to obtain titles to lode claims. I do not know any valuable placer lands which are unworked because the outlets are controlled by claimants under other than mineral titles, although this is liable to become a matter of litigation between parties at the mouth of the gulch. From my experience and observation I draw the conclusion that the mining laws of Congress in regard to placers need amending in the following particulars:

1st. For two years after a placer is discovered miners should be allowed to make their own laws in regard to size of location, manner of representation, &c.; after that those matters should be regulated by Congress.

2d. After local laws are abolished, placers should be required to represent by labor, marking boundaries, &c., in some such manner as is prescribed for quartz lodes.

3d. Five hundred dollars' worth of improvements on any claim should entitle the possessor to a patent for separate claims in the same or different applications, provided they are situated in the same mining gulch or district, and provided, also, that the applicant shall show that he includes nothing but *bona-fide* mining ground.

4th. There should be a stated time when acreage should be paid, and the failure on the part of an adverse claimant to comply with this provision after his possessory title has been confirmed by a court of competent jurisdiction should leave the applicant free to continue his application the same as though there had been no adverse claim.

5th. Placers should be surveyed by the system of triangulation, and the manner of patenting by this system should be simplified as much as possible. In this gulch miners have patented both by old location and legal subdivisions. It was generally understood that the Interior Department favored the rectangular system the most. Then there is long delay and extra expense in obtaining order of survey, posting and filing plat, &c.; consequently some thought best to make application by legal subdivisions and suffer the inconvenience of leaving out corners of actual mining ground and taking in some of a worthless character. The two systems do not work well together, and either the one or the other should be abandoned.

6th. The manner of contesting adverse claims should be made more simple, so as to avoid all harassing delay and unnecessary expense.

In conclusion, I trust that it will be considered that I have not been overofficious in this matter, and that some information may be gleaned from this crude statement. It is possible that my experience in adverse claims is somewhat isolated, but such may occur again.

Respectfully,

LAWRENCE A. FENNER.

Testimony of William Flannery, Bozeman, Gallatin County, Montana.

The questions, to which the following answers are given will be found on sheet facing page 1.

1. William Flannery; post-office address, Bozeman, Gallatin County, Montana; farmer, stock-raiser, and owner of a saw-mill.
2. Thirteen years.
3. Yes, by pre-emption, homestead, and timber-culture act.
4. From reading, inquiry, and observations.
5. The expense of filing a pre-emption was from $3 to $8, and homestead from $16 to $24. I do not remember the amount required when final proof is given. I do not know the expense of contested cases. The average distance to a land office in this Territory is about 100 miles. The time it would take to make a trip and do business would be six days, traveling expense of a man and horse would be $4 a day. This would be the expense when a party would furnish their own horses. Other modes of conveyance are more expensive.

6. The register and receiver ought to have a fixed fee for getting up all the papers necessary for getting a title to public lands, and oblige them to fill blanks without charging an attorney's fee. Public land in the Territories ought to be pre-empted in all cases at $1.25 per acre. Railroad lands ought to be settled and acquired at a fixed cost with the other lands. It retards settlement too much to have one-half the land withdrawn for railroad purposes and one-ninth of the other half for school purposes.

7. Consists of mountains, foot-hills, and valleys, limestone formation predominating on the surface. Valleys along water courses usually excellent agricultural land. There is some swamp-land which has an imperfect drainage; it usually has an excess of alkali. Foot-hills are agricultural, pastoral, and sometimes mineral; mountains are mineral and timber.

8. The classes of land are so mixed up in this Territory it cannot be classed without a careful examination of each tract by competent men. The only general rule that could be adopted in Montana is to class all mountains as mineral and timber, foot-hills and valleys as agricultural and pastoral; then there would be some agricultural and considerable grazing land in the mountains, and some mineral lands in the foot-hills and valleys.

9. The present system in theory is satisfactory to the public. It might be modified so as to meander where there are natural divisions as between hill, mountain, and valley. It would be quite an inconvenience to the public to get educated on a new system of survey when the present one gives satisfaction. Timber in the mountains would have to be surveyed meandering with cañons and ridges. Mineral surveys would have to meander with the minerals claimed.

10. The present system seems to me to be all that could be desired, except the desert act, which does not accomplish what it was created for. There is considerable land taken up under this act that can be watered as easy as the average of the land taken up under the homestead law in this Territory. During the settlement of the Indian question large tracts of country are made habitable to white men by Indians being compelled to go on their reservations and quit their roaming habits. This land is first occupied by cattle and sheep, whose owners command considerable capital. They do and can take up large tracts of the most valuable agricultural land and put water on at a nominal price, and when they get a title to it will hold it for speculative purposes. There ought to be inducements given to capital to sink artesian wells and bring irrigating canals on land that is very difficult to bring water on. Such an act should reserve all land that has a supply of water easy to control. I would suggest that a desert claim of 640 acres should have an irrigating canal that would cost $1,000 to $1,500, or an artesian well sufficient, allowing a section of 640 acres to make four farms of 160 acres each. Three or four hundred dollars for an irrigating ditch is not too great an expense for a homestead or pre-emption in this Territory. Very frequently $1,000 or more has been expended on getting water on homestead land. A desert act should be free only to land that individual enterprise, under the homestead and pre-emption laws, would not settle.

AGRICULTURE.

1. Rainfall, light; snowfall, in winter considerable; supply of water for irrigating everywhere sufficient at some cost; climate, cold but seldom severe.

2. Grain crops are sowed in April and May, and harvested in August and September. April, May, and sometimes June, have sufficient rain. When it rains on the valleys, it snows on the mountains, the more rain the colder. Crops do not grow fast until the dry season, excepting of course the natural grasses, the source of water being in the mountains, snow on which does not thaw until warm weather.

3. Very little.

4. Nearly all the arable land.

5. Wheat, oats, barley, and like cereals, Irish potatoes and all the hardy vegetables.

6. Wheat in this county is scarcely ever irrigated but once. The amount of water required is controlled by local influences on character of soil, the amount of fall, evenness of surface, &c. There could be no general standard quantity for each acre that would be satisfactory.

7. Almost every stream large and small can be used at some expense for irrigating.

8. Irrigating in a dry climate means a sure crop from this cause. I would not give a good irrigating system for any climate I know, for agricultural purposes. Irrigating does and must improve the fertility of the soil, for it leaves everything it holds in solution, which is considerable in the higher stages of water. Crops can be raised on an altitude of 5,000 feet or perhaps greater.

9. During the irrigation of crops all the water turned into the ditches is supposed to be used. After irrigating some leave water in their ditches through carelessness and for uses other than irrigating. The law of the Territory gives a prior right to water to irrigate 160 acres, and does not allow waste to the detriment of others.

10. The Territorial laws require ditches to be recorded in the county clerk's office. Most of the ditches are held without any record, by continued possession. There may be trouble to find who has a prior right after this generation passes away.

11. There is some difficulty between parties on small streams, but no legal conflicts.

12. One-half.

13. It is not. Considerable good agricultural land would be taken up and monopolized under such an act. Let the herds of stock occupy the land first free, and then let homestead settlers occupy the land and take the place of the large herds of stock.

14. No. I would give the range now to stockmen free, allowing all to occupy it under the homestead and pre-emption acts, and then in time it will be occupied by permanent settlers. It is impossible now to establish the agricultural limit of this land. There is in some of the "bad lands" as fine wheat land as there is anywhere.

15. Without having any accurate knowledge, I would say 3 acres. This county is as good grazing as any in the Territory.

18. Increased; got thicker.

19. But few. Would depend on locality and with regard to water and shelter.

20. If herds were confined to specific ranges it would increase the cost of herding, but would allow cattle raisers to improve their herds without being interfered with by their neighbors' inferior stock.

21. Numerous mountain streams and springs.

22. Five.

23. Increased.

24. Yes.

25. Some jealousies, mutterings. No conflicts.

26. There are 8,760 horses, 46,704 cattle, and 26,110 sheep in this county. Horses and cattle are let run at large and looked after. Sheep are herded in herds from 500 to 3,000.

28. Yes. Mounds are not large enough, and where rock is used hard to identify and find.

TIMBER.

1. Two-fifths of the mountains are covered with pine, different varieties. There are cottonwoods along the streams and scrubby cedars on the dry foot-hills in places. There is but little in this section fit for lumber.

2. Planting timber has been practiced only a few years. Cottonwoods are principally planted. There has not been enough of experience in the business to form deductions from.

3. In disposing of timber land in the mountains a right to discover and work the precious metals should always be reserved. Farmers and stock men the owners of 160 acres of land or less amount in proportion ought to have a homestead of 80 acres of timber, providing that they make proof before they get final title that they have lived on their farm for which they want the timber land five years, and settlers taking up a homestead ought also be allowed to take 80 acres of timber. The advantages of giving farmers a tract of timber are numerous, among which are that it will cause farmers to acquire a habit of owning timber among them, which will often cause farmers to plant tracts of timber when it cannot be otherwise procured. Their use of timber is constant, and the amount of timber required by a farm can be estimated, which cannot be done in any other business, &c.

I would sell tracts of timber not exceeding 160 acres to owners of saw-mills, mines, manufacturers, or owners of any business that requires the use of timber, allowing them to locate a tract sufficient for their business for two years, not exceeding 160 acres at $1.25 per acre, providing that the land and timber not used shall revert to the government five years after it was purchased, allowing a party to buy a new tract when they pleased, but providing that any former purchase for the same business shall revert to the government, &c.

Timber in the mountains frequently in inaccessible cañons, in which it is difficult to make roads, and the enterprise that will make those roads ought to be protected by obliging others that may use them and be benefited by them to pay a reasonable proportion of their cost, as in the case of joint fences or other mutual benefits. Under existing Congressional law the Territory cannot accomplish anything like this. Popular opinion thinks that the government ought to give the timber in the mountains free, which may be the best way. In any case, those that make expensive roads to inaccessible places ought to be protected in their enterprise. As the matter stands now they are left to the generosity of the American people, the majority of which respect men's rights in such cases.

4. It may be advisable to distinguish between forests that are sufficient for export and that which is only capable of common domestic uses, of which there are large tracts of country that contain only the latter, and some which contain the former.

5. There is a second growth of the same kind of timber rather slow to start, but when started grows fast.

6. Forest fires were apparently very frequent before settled by white people, and is now where Indians roam. Since, and where settled by white people, there has been but few fires. There was vast quantities of timber burned apparently before this country was settled, but now has grown up in young pines. Tracts of prairie are never burned here. The grass is needed dry or green. The laws of the Territory make the careless use of fire on prairie or timber a criminal offense.

7. In this Territory there is no source or supply of timber except in the mountains, which is not agricultural, and is mineral land; therefore all the timber used is off government land. I cannot say that there is much unnecessary waste. It would be necessary to enact laws against waste of timber; it would be necessary to give the public a reasonable time to change from the old to any new system that may be established.

8. It has been decided in the courts that when timber was felled and moved it was then the property of the party who felled and moved it.

9. Their position would suggest that they ought to be the custodians of the public timber.

I do not want to make any suggestions on mineral land. The inclosed are the views of the masses of the American public, which have the welfare of the masses and the best interests of the government in view according to my knowledge and belief.

Very respectfully,

WM. F. CANNERY.

Testimony of George B. Foote, mineral deputy surveyor at Helena, Mont.

GEORGE B. FOOTE, mineral deputy surveyor at Helena, Mont., testified September 26, 1879, as follows:

I have lived in Montana since 1864.

Question. What do you understand the apex of a lode to be?—Answer. The apex of a lode is the highest point where it reaches the surface. It is not always possible in the early workings of a claim to determine the apex of a vein or lode.

Q. Has there been much litigation here?—A. There has been considerable litigation in regard to the jumping of placer claims; more in regard to placer claims than lode claims. In lode claims there has been some litigation growing out of a variety of locations conflicting. Lodes interfere one with another.. The parties are often unable to tell which is the real owner. I have known two parallel seams, otherwise on the same outcrop, being located by two parties; and this gives rise to contest.

Q. Are or are not the outcrops of lodes often wider than the local width of claims here as defined by United States, State, Territorial, or local district regulations?—A. There are not in the Territory of Montana any such lodes. Under the old law of the Territory claims used to be 100 feet on each side of the vein; but the Secretary of the Interior decided that 100 feet on each side of the vein meant from the center of the vein. I carried the case up to the supreme court of this Territory in 1874-'75, and the supreme court of Montana decided that it meant each side of the vein itself and not each side of the center; and on that decision I got a patent for quite a number of mines. That law is now repealed and the United States law is accepted.

Q. Are or are not a large majority of the discoverers of rich veins, or their assigns, often burdened with costly litigation to defend their rights from subsequent locators in their immediate neighborhood? And in such cases is or is not the legal attack most often directed to the portion of the dip of the lode which has passed beyond the exterior lines of the surface tract?—A. Yes, I know such cases.

Q. In view of the known variety and complexity of mineral deposits in rock in place is it or is it not, in your judgment, possible to retain in the United States mineral laws a provision by which locators can follow the dip of their claims outside their side lines without provoking litigation?—A. Yes, by making a square location. I believe in the square location of all mines. I think it would be to the interest of the miners and every one else to make a square location of so much ground and confine them to that ground.

Q. Have you ever taken part in organizing a local mining district?—A. I have taken part in the organization of mining districts, but that is abolished now in the Territory of Montana.

Q. State generally the mode of originally taking up and locating a mineral claim under mining customs and the effect of a record of such location.—A. Now a man locates a claim and files an affidavit in the county recorder's office.

Q. Is that record capable of subsequent amendment; and if so, how?—A. A person can alter a location before it goes up to the surveyor-general. There can be any amount of fraud committed.

Q. Within your knowledge have mining titles been distributed or litigated through fraudulent manipulation or destruction of these records? If so, what security is there against such frauds?—A. Yes, sir. In the decision of the supreme court in the case of Carpenter *vs.* Rankin, a case over in Washington County, in this Territory, which went to the United States Supreme Court on appeal, the Judges of the United States Supreme Court gave the judges of the supreme court of Montana a blowing up, because they would not admit the testimony of competent persons after the records had been destroyed.

Q. Calling your attention to the fact that a copy of the certificate of location as certified by the local mining recorder is the sole basis of the paper title for a mining claim under existing law, and that compliance with the varying customs of innumerable mining districts constitutes the preliminary acts upon such claims, state whether in your opinion all mining district laws, customs, and records could advantageously be abolished as to future locations and the initiation of record title be placed exclusively with the United States land officers.—A. I think it would be much better, and I think it ought to be done.

Q. Calling your attention to the fact that under present laws an adverse claim, in proper form and seasonably filed, suspends the administration of the mineral laws by the United States land officers and transfers the jurisdiction to the courts of law, both State and United States, please state whether in your opinion the adjustment of controversies concerning mineral lands prior to issue of patent should not be left absolutely to the United States land officers in the same manner as contests are under all other land laws?—A. I think not. I think there should be a method of getting a case into our Territorial courts to be tried by juries of miners.

Q. If you consider it desirable to retain the leading features of the United States mining laws, what amendments, if any, would you suggest to remedy any defects which your experience or observation has detected? If, on the contrary, you believe that the practice of following the dip beyond the side line of a claim is incompatible with satisfactory administration, what method of location would you suggest?—A. In the first place, the United States law should be so amended that if mill-sites are allowed to be located, I would make it at least 40 acres to the location. I would have men and locations confined to the square location. I would also have a number of things in the land office simplified.

Another thing. It is an outrage on all miners, and it is an outrage on every claimant, that a man that goes there to Washington and puts out a little cash can get his patent through very soon. I would have the Land Office adopt the same system as the Patent Office. I would not have any preferred claims. Unless a man gets an attorney in Washington it takes from one to four years to get a patent in its usual course, and sometimes it takes five years. Another thing which is bad is the fact that, although the land is paid for and the patent certificate sent up to Washington, instead of that patent being sent here to the district land office that they may record it on their books, the patents are delivered to persons in Washington and no notice of their delivery sent to the district land office. The district land office frequently gets notice of the delivery of patents from Copp's Land Owner and from the parties themselves.

Q. From your personal experience, please state the time and expense of procuring a mineral title; whether possessory or by patent, both with and without contest.—A. All claimants within two years from date of their application should be compelled to pay up. It might be ten years with a contest, or perhaps it might be a thousand years without contest. For an ordinary lode claim the cost is: for the surveyor-general's fees, $25 to $40; land office fee, $10; surveyor's fee, from $60 to $50; making papers and notary's fees, $25; publication, $25; recorder's fees, from $5 to $10. I think the law ought to be amended so as to allow attorneys in fact to make applications, and make out all necessary papers filed in adverse claims.

I am familiar with the rectangular system, and I think it is the best system that can be adopted. I think it might be well to use triangulation in order to overcome natural obstacles like hills, mountains, &c. The monuments in these surveys are very poorly established. There is great complaint among the settlers on that account. I am very frequently employed by persons to make resurveys. It usually costs a settler considerable money. In three years the monuments disappear so that the corners cannot be found. I think it is due to the contract system. I would remedy it by paying more money for the surveys and having an inspector. Then there should by all means at convenient distances be fixed monuments established. Most deputy surveyors use the solar transit on the mining lands. In sub-dividing many of them use the needle. I think it would be well if the deputy surveyors should carry an aneroid barometer. There is much bad surveying done. In township 8 north, of range 3 west of the principal meridian of Montana Territory a creek is laid down as running in sections 29 and 32, but it runs three-fourths of a mile west of where it is laid down. I have frequently found quarter sections that would not tally out. Range No. 9. west of the principal meridian will show some very bad surveying, and on the ground I can show worse surveying than that, although it looks pretty well on paper. You cannot go

to the county recorder's office where the records are kept and find one in fifty mines from the description given there. I can show you claims here that are not within six hundred feet of where the plat puts them. Take the Nellie Grant mine in Jefferson County, Montana, there was no survey made of this mine before they got a patent for it. I would remedy this sort of thing by employing better men, giving them more money, and using better instruments; and before they get their pay, let their work be inspected. I think there should be closer surveys made.

I think the timber ought to be surveyed and sold. For instance, a man who is a mine owner or mill owner or owns a range should be allowed to come in and pay for a certain lot of timber land. I would sell it for $1.50 per acre. I would sell the timber, reserving the mineral on the land. If a man bought a mine with timber on it I would give him the timber. Under a proper system of irrigation one-sixteenth of this Territory can be irrigated. I think that the pastoral homestead idea is a very good one, but I am afraid that a great deal of fraud would be committed under it. A man with large herds I would allow to lease or keep the land until they were able to buy it. I do not think the government ought to charge more than fifty cents an acre for it.

I have had experience in surveying ditches and the usage is, and I think the law also, that when parties take up water and use it or put it to use they have the exclusive right to that water. They take it all and do what they please with it. They are not compelled to return it to the stream, although I believe there was a law passed at the last session of the legislature where if water is not used it shall be returned to the stream. This relates to the use of water for irrigating purposes, but it ought also to apply to mining.

I think that the desert-land act is a very poor act. They are taking up irrigable lands under it and sometimes take up marshes and swamps. There is one suggestion I would make in regard to this desert land. For instance we have thousands of acres here that could be irrigated and made good land by bringing a canal from Jefferson River around the different bench lands here and cover these low valleys; but it is an enterprise which will cost thousands and thousands of dollars, and can only be done by aggregation of capital or by some company. I think the government should give every alternate section for irrigating purposes; that is, the government should assist irrigation by this means.

I think the placer-claim law ought to be so amended as to compel "representation" by parties making placer claims, the same as lode claims.

Testimony of Daniel Flowerree, stock and cattle raising, Helena, Mont.

DANIEL FLOWERREE testified at Helena, Mont., September 27, 1879, as follows:

Am engaged in the stock and cattle raising business. My range is in the Sun River and sweet grass country, about 80 miles from here on the Yellowstone. I have in the neighborhood of 11,000 head of stock. It takes about 30 acres to support a head of beef.

I have no title to any of this land, except a homestead and pre-emption in the Sun River country.

Our cattle range in herds of about 8,000 head. Each herd ranges over about 25 miles square. This range is about 25 miles square, and I think about 8,000 head of cattle pasture thereon. I cannot state the size of the other range, because I have just driven our stock on to it. Our oldest stock ranges are well stocked, but this is not the case where they are newly settled.

In my experience, a range decreases year by year by feeding; it takes more grass each year. I think ownership would be beneficial to the stock, to the country, and to the settlers. There has not been any conflict between sheep and cattle men, but there is likely to be trouble after awhile. Cattle and horses will not graze where sheep have been. The sheep graze the ground very closely, and a very long pasturage of sheep kills the bunch-grass. I have noticed in Oregon, where sheep have fed they have cleaned up the grass, and dog fennel has grown in place of it. I saw this more plainly in Oregon than I have here, because our ranges are all new here.

I think something ought to be done with the pasture lands, but I do not know just what. I think it would be well to allow a man to own land to the extent of his herd. I think the pasture homestead theory is a good one. This land is worth from 20 to 25 cents per acre, but I should limit a man to the amount of stock he owned. In the course of time we will certainly have trouble here—the sheep and cattle and horse interests will conflict. In nine cases out of ten sheep men will come in on the cattle men and drive them out, and eventually the cattle men will have to leave.

The cattle interest is largely on the increase here. It is becoming a most important

interest. There is more real money invested in stock than in mines. I know of one man over on the Sun River, Mr. Concourse, whose cattle could be sold to-day for $160,000 in cash. The next herd to his is that of A. A. Clarke, and his herd is worth nearly as much. There is another herd there which is worth $140,000, and the herd that Bob Ford owns is worth from $75,000 to $80,000, as also the herd of the man next to him. The herd of John Mining is worth not less than $40,000, and there are many more of them. You could go through Sun River; you could gather up right on Sun River more than would buy the whole Penobscot country. My herd is worth $160,000. In the future, the pasturage interest is to be a great source of wealth. It is worth all the mining of the country.

The bunch-grass interest has not been represented; only about nine years since men went into the stock business. We have here bunch-grass, blue joint, and the Buffalo grass. The bunch-grass, although it carries a larger number of seeds, if the cattle eat the seeds off and they do not fall on the ground, the grass comes again from the roots; the blue joint also grows from the roots principally. The other grasses I do not know much about.

We have considerable white sage. We do not have much other sage bush. There is less where I live than in the other parts of the Territory. I put up no hay for my stock. The only land I own is 580 acres, a desert-land claim, and 380 acres which I took up under the homestead and pre-emption law. If I had an opportunity I would get a title to that range and make my cattle businessa a permanent thing.

I know of no better way of disposing of the public land than through the register and receiver. I think that the men who are occupying the land should have the first chance to buy it; that the cattle settlers should be preferred.

Testimony of James Gibson, stock raiser, Old Agency, Mont.

The questions to which the following answers are given will be found on sheet facing page 1:

OLD AGENCY, MONT., *October* 5, 1879.

To the members of the Land Commission, Washington, D. C.:

GENTLEMEN: Your circular received.

1. My name is James Gibson; my residence, Old Agency, Choteau County; and my occupation that of a stock raiser.

2. I have lived in this county seven years and in the Territory fourteen years.

3. I have not yet acquired a title to any government land, but am now perfecting two—one under the homestead and one under the desert-land laws.

4. My opportunities for gaining any practical knowledge of the working of the land laws is limited, this section being comparatively new to settlement, no one within twenty-eight miles of me having yet acquired a title to any land from the government.

7. The physical character of the land of this section is level, bench, and valley, the benches being remarkably level, and the valleys—the Marias, Teton, and Sun River, with their several tributaries—are fertile, though the soil is rather shallow and of a sandy character. The surrounding country is entirely free from mineral, and timber only existing on the mountain sides, distant 20 miles. There are known to exist within 25 miles four or five coal veins.

10. In my opinion no one individual should be allowed to acquire from the government more than 320 acres of the public lands, and they should be taken under the homestead and pre-emption laws as now existing, except that the party taking the land should be allowed to pre-empt as well after homesteading as before. The timber-culture law is good, except that it gives the individual too much land. The desert-land law in my opinion is the worst of all existing land laws. It has no friends among the classes who build up a country, and they are loud in denouncing it a fraud. Even among those who have benefited by the law will be found numbers who consider it an unwise law, but took the land up, like I did, to get the start of others whom the law would have permitted to have done so. If the government see fit to dispose of the lands of Montana to the moneyed classes, she should at least wait a few years before doing so, in order to give the emigrants who are just commencing to fill our Territory an opportunity to locate upon some of the eligible sites, and there are many.

AGRICULTURE.

1. The climate of Montana is remarkable; it appears to be changing. Previous to four years ago, or five at the outside, rain was an unfrequent occurrence. Eight years

ago it was a remarkable occurrence. Twelve years ago a rain was a phenomenon; it would astonish the beholder as much as three inches of snow in Washington City on the 4th of July. Within the last two years the rainfall has been nearly, not quite, sufficient for irrigation. This year the rainfall has been better adapted to irrigation than last. To-day, the 6th October, it is raining, and was raining all last night. It is a steady rain, such as they have in Pennsylvania. A rain at this time of the year I don't recollect of ever having seen in Montana on the eastern side of the mountains before.

2. What may be termed our rain season is the latter part of May and June.

3. There is no portion of this section that has been successfully cultivated without irrigation, though it was tried last year about our rainiest season.

4. Three-fourths of this country could be cultivated with irrigation.

5. Our principal crops are wheat, oats, and potatoes.

6. I am unable to state the quantity of water required to irrigate 100 acres of wheat, having never given the subject my attention.

7. The supply of water is considerable, though small when the great extent of country is considered. Some of the finest wheat lands in the country will never be fit for anything but grazing purposes unless our rainy seasons continue, and I think it very probable that they will. The water supply for present irrigating purposes is ample, and consequently there has been no cause for any trouble about water among ranchmen.

13. In my judgment, if a person desires to locate his homestead on pasturage lands he should be permitted to do so the same as if he had located elsewhere. I do not consider it advisable for the government to put the so-called pasture lands in the market for private entry. They should be held back at least a few years for actual settlers. If the government were to put these lands in the market for private entry, they would be bought up by moneyed men who would have capital to invest, and who would most probably not own a hoof of cattle in the world. They would not locate their lands back on the arid plains for the purpose of securing a range for their herds, but would locate their purchase on the low benches along the streams or back on the higher benches, where with a little expense a river could be turned, thereby redeeming some of the best agricultural land in Montana. I could locate four townships and with very little expense turn the Teton River on it, and thereby make a fortune, provided I could borrow the money until I made the turn. The best lands of Montana are yet to be taken up. I would advise the government to wait a few years.

15. The cattle of this section occupy a common range, as elsewhere. It is difficult to state what amount of pasturage one animal requires to fit it for market. The grass is visibly diminishing on this range.

17. There are between 12 and 15 head of cattle to a square mile on this range.

19. Cattle men do not fence their ranges in this country, and it would not be safe to fence cattle in on a range in winter unless it was quite extensive.

21. Previous to four or five years ago the source of water supply for stock was the rivers and small streams, but since then numerous lakes have been formed by the rains on the benches, and contain water the year round. Besides these lakes, the country used to be cut up with dry ravines; now all the deep ravines have flowing springs, and there are indications that the shallow ravines formerly contained running water.

23. There are but few sheep on this range at the present time.

24. There is no doubt but what sheep will hurt the pasturage for cattle and will eventually drive them off.

25. There has been no conflict between the sheep and cattle men of this section.

26. I should judge that there was about 30,000 head of cattle and about 8,000 head of sheep in this county. Cattle are not herded, but are at liberty to roam wherever their inclination may lead them, so long as they do not cross the borders of a certain specified common range. Sheep are all herded; 3,000 head is considered the maximum number to be herded together.

28. It is somewhat difficult to find the corners of surveyed lands.

TIMBER.

1. There is no timber land in this section except the forests of the mountains. The timber is pine, spruce, and fir.

2. There is no timber planted in this section except cottonwood.

3. I think it is somewhat soon to dispose of the forest-timber lands.

5. When forest timber is felled there is a second growth, although there is but very little timber felled.

6. Forest fires of this section are caused by Indians who are allowed to leave their reservations. The fires are very destructive, and the only mode of prevention is to keep the Indians on their reservation and offer a reward for the apprehension of any one who shall maliciously or carelessly set out a fire.

7. The only use that timber is put to in this section is for building and fencing purposes and for fuel. The mountains are covered with dry fallen timber, much better for buildings and fuel than the green standing timber, consequently there is no waste, as the fallen timber will lie there and rot if it is not used.

8. Timber, when cut into logs or rails, belongs to the chopper.

9. I think that the custody of the timber should be placed within the jurisdiction of the district land office. Mining I know but very little about.

I have the honor to remain, respectfully,

JAMES GIBSON.

Testimony of W. C. Gillette, sheep raiser, Dearborn, Mont.

W. C. GILLETTE, of Dearborn, Mont., testified at Helena, September 26, as follows:

I have lived here nineteen years. I am engaged in the sheep business. I have about 6,000 sheep. I think about eight sheep are equivalent to one beef. I think about 25 acres of land will sustain that number of sheep. I own 160 acres as a homestead, and there is unlimited range around that. My range does not interfere with other people. It is 4 miles one way and 12 or 15 the other. This range is on surveyed land. I hold it by common consent. The Territory is not one-fourth stocked yet, and there is no trouble as yet between the cattle and sheep men. I think that sheep and cattle can live on the same range, provided it is not too heavily stocked. I do not think this land should be sold. I think they should be let run.

I do not favor the pasturage homestead. I would like it myself, but I don't believe it would be good for the majority of people. Under proper restrictions, it might be well to give a pasturage homestead of 3,000 acres, but I would provide that the settler should not have more than 160 acres on a stream, and, where he located, that it should extend back into the arid lands. He should not monopolize the whole water supply.

I do not think that our range decreases under our system of feeding. Our system is to feed on the range until the grass becomes a little short and then move off. This gives the grass an opportunity to recover. Through the winter we keep the sheep only three months on the home range—we only keep them about fourteen weeks at any one point. If the government does not make a pasturage homestead I think it will be better to leave this land just as it is. The agricultural land and the irrigable land should be taken up under the homestead and pre-emption act as it is at present. I do not think there is any hurry about settling the question here. I would be willing to allow the stockmen to purchase the land to supply their herds, provided that it was positively arid land; but I think it would be very hard to discriminate. I would not advocate the sale of these lands in large tracts, I would rather leave it as it is. I do not strictly consider this an agricultural country. I would like very much to take up land under the desert-land act, but I cannot make sure that it is desert land.

The largest number of sheep owned here by any one man is about 16,000 or 17,000. They herd in bands of about 3,000. I think there are about 150,000 sheep in the Territory and about 300,000 cattle. Sheep average about $2.25 per head, mixed breed, cots-wool and merino. We have scab here but no hoof rot—the alkali cures the latter. We treat the scab with sulphur, lime, tobacco, corrosive sublimate, carbolic acid, &c.

I know very little about the timber. I do not think it should be sold. I think it should be reserved for actual settlers. We have some coal here within 12 miles of Helena. Near my range on the Dearborn there is some that is of fair quality. I think there is enough to supply this region. There is some coal on the Dearborn near Eagle Rock. There are surface croppings. I once came upon some which I supposed to be an old camp fire, but found it to be coal.

In regard to mines, I think it would be much better if the law should remain as it is, but I think parties should be compelled to pay up. There is no land here that can be cultivated without irrigation, except in a very few cases, which are phenomenal. I think about one inch of flowing water to the acre is sufficient to raise a crop.

No cattle or sheep men are fencing their ranges here.

Testimony of R. D. Harrison, assay office, Helena, Mont.

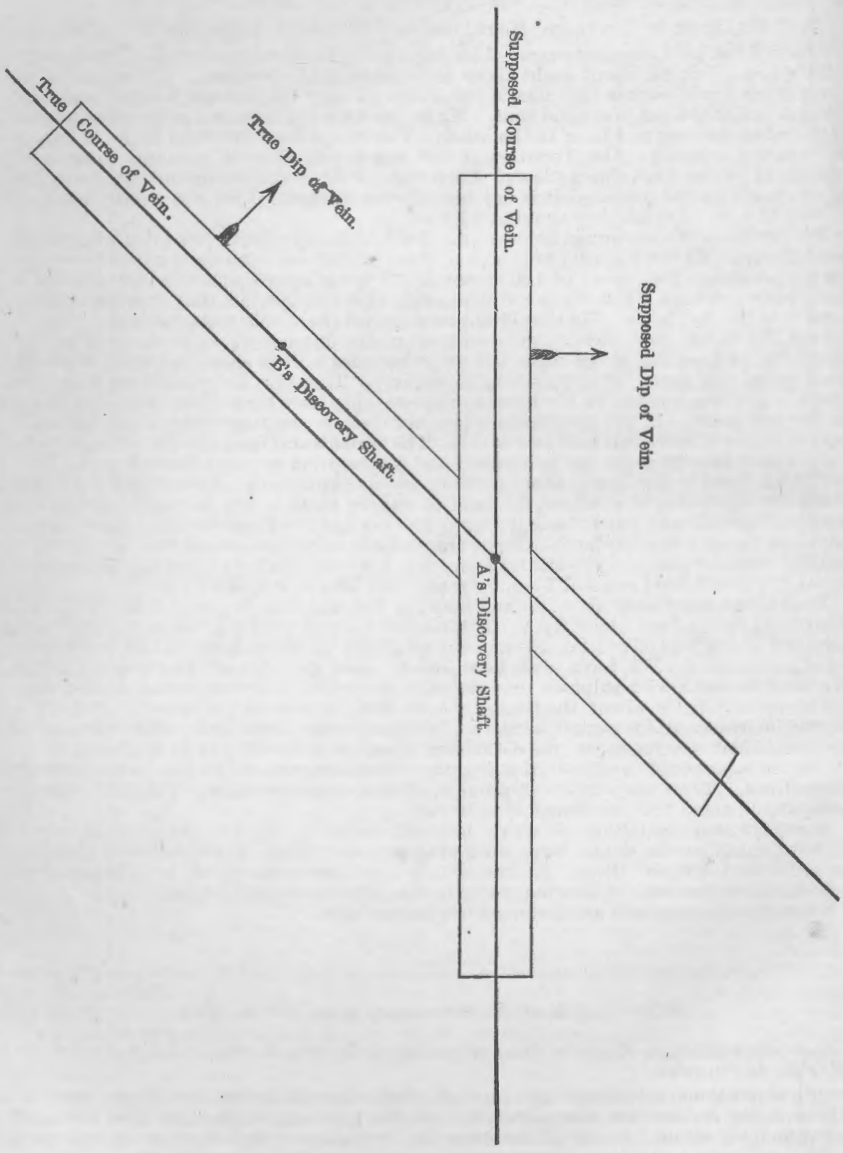
R. D HARRISON, in charge of the assay office at Helena, Mont., testified, September 27, 1879, as follows:

Grave questions, involving large interests, sometimes arise here in mineral matters. For instance, A discovers a mineral vein, locates his claim under the law, but does not take up a patent; stakes off his claim 600 by 1,500 feet, but does not do any more work for a while; yet he is within the law. B, in working near him, discovers that

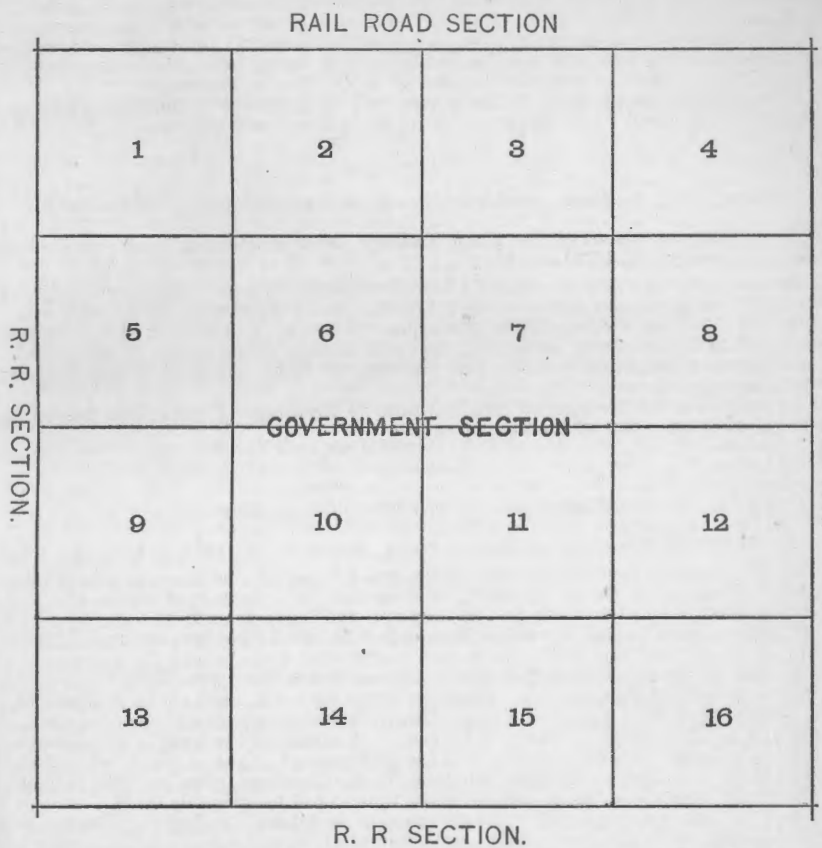
A is not on the vein—that is, he is not following the direction of the lode—and he discovers a cropping, say 300 feet, from A's shaft diagonally, and he thereupon puts down his shaft and locates a claim and stakes it at 1,500 feet by 600, running diagonally to the surface of the side lines of A's claim. Then the question is, who is entitled to the ground from A's side lines to B's discovery shaft, for the reason that A is entitled under the law to his discovery vein, and to 1,500 feet following the vein, and to 600 feet across the vein.

Cannot A now swing his claim around so as to take in part of B's claim and hold it under the law? There is a practical case in this country that I know of. I believe it has been tested in some State or Territory, and it has been carried to the Supreme Court of the United States; but I do not know how it has been decided.

The diagram I now hand you will explain the situation and show the application.



I also hand you another diagram which explains itself. It is in relation to the relative location of railroad and government sections of land,



Sections 5, 6, 7, 8, and 9, of 40 acres each, taken. Sections 10, 11, 12, 13, 14, 15, and 16, of 40 acres each, taken under desert land act. Sections 1, 2, 3, 4, of 40 acres, desired to be located by same party and at the same time as 10, 11, 12, 13, 14, 15, and 16, under the desert land act, but cannot for the reason that the subdivisions are not contiguous.

The desirable water rights here are all taken up in the valleys in this immediate vicinity, and to bring water on the ground requires expensive ditches.

I took up a range early in the spring under the desert-land act, and down there the water is all taken up for a long part of the year out of the Deer Creek, and this has been an unusually dry season; consequently there has been a great deal of quarreling among the neighbors there about their water being scarce.

Owing to the scarcity of water some grain planted died for lack of water, and the neighbors quarreled over it. A great deal of ill-feeling sprang up on account of one shutting off another's water supply in order to procure enough for himself.

The theory is now that when a man takes up water rights he is entitled to the first right, or all he wants, and the next man is entitled to what that first man left, if he wants it, after the first is through. There is hardly any law here; it is merely custom; it is first come first served. I think there ought to be a law which would define each party's rights so far as the water is concerned. There was a case right there on the creek where a party on the head of it was located, and he had so diverted the water that it did not run back into the creek, and the rest of the people in the neighborhood tried to force him to do so.

I believe in the square location in mineral lodes. It will save or stop half the lawsuits in existence. I believe in a general mining law for the United States, and I believe in the register and receiver of the land office having jurisdiction over the timber and mineral lands. In my official capacity I see a great deal of charcoal and wood, and I feel confident the parties who made it did not pay a penny for the timber used.

I think the original locations in mines ought to be filed in the district land offices. I think the government, through its officers, should control all this land.

For the year ending June 30, 1879, the production of the mines was about $2,500,000 in gold and $3,000,000 in silver. I think there will be an increase next year, but it will depend entirely on the water; for placer-mining is slowly falling off, because the ground is being worked over and so much land is being held and not worked. I think a man ought to be compelled to pay for a placer-mine and work it.

I estimate that the yield for the next year will be $3,000,000 in gold and $3,250,000 to $3,500,000 in silver. I think the estimates heretofore made have been high.

Testimony of S. F. Hauser, president of the First National Bank of Helena, Mont.

S. F. HAUSER, president of the First National Bank of Helena, Mont., testified at Helena, September 27, 1879, as follows:

I am a mine-owner and capitalist; I have lived here sixteen or seventeen years. I have heard the statement just made by Mr. Holter, and I corroborate it in nearly every respect. I think he is wrong about these pasture lands. I believe in the pasturage homestead, and I believe in protecting the cattle settlers to the extent of their herds. It will prevent litigation, trouble, and fighting. I think the land is worth about 20 or 25 cents per acre.

I do not think the increase of rain amounts to anything. I think it is absurd to build expectations upon an increase of rain.

Testimony of L. H. Hershfield, Helena, Mont.

L. H. HERSHFIELD testified at Helena, Mont., September 25, 1879, as follows:

I have lived in this country sixteen years, and I know all the country pretty thoroughly. Those lands in the Territory that cannot be irrigated, of course the best thing for them is to leave them just as they are, and leave them to the stockmen. I think, if they must be sold, I would allow each man to take lands to the extent of his herd. If the government retains possession of the land, and permits the stockmen to use it, I do not see any difficulty about it. There is a difficulty if men are permitted to buy it in unlimited quantities. Then the large man will have all he can possibly get, by buying, borrowing, or stealing. He will certainly get it all some way, if you allow him to purchase it. I would not lease it. I would let the land be in possession of the government, just as it is now, and the government ought to decide what is the character of these lands. All our high lands in the Territory, even the second-bench lands, would be grazing lands, and all below that would be irrigable lands.

It is a very serious question for the government to determine what these lands are; they are being consumed too rapidly; and whereas all these lands are held in trust by the government for those who come after us, it should protect them and guard them well and not allow any primogeniture—the first son to get all there is. Our lands are all good; for instance, the whole tract of land that lies around here. It takes considerable money to get a ditch on that land, but the time will come when a colony will form here and, by putting the water on this land, fully utilize it. I know of just such a place now. It will be a pity to dispose of that land under the desert-land act or any other act. Leave it to those persons who want to make homes of it. It is not necessary to survey it. Just leave it the way it is, holding it under possessory rights. If a person has 50,000 or 60,000 head of cattle, occupying a region 100 miles square, his cattle will herd in one direction, another man's cattle would herd in another portion within the same boundary; but if you go to work to establish metes and bounds for cattle ranges, other stock coming there would be trespassers, and the occupant would have the right to exclude them, because he would want to keep his grass fresh, and where would you be if you adopted a law of that kind?

They have land in Colorado now, and in this Territory, that is unfit for agricultural purposes even if you could get water on it. Take all that northern part of Colorado lying east of what we call the "cut-off" from Denver north. Take it along the Bijou, although the country is very good pasture land, at the same time it is unfit for agricultural purposes.

Now they are taking up land in the Yellowstone, under the desert-land act, which is not desert land. That is an injustice to the people who will come to settle on these lands. I would repeal the desert-land law for a country like this; but there are portions of the country, down on the Gila, that it would apply to. I am not in favor of the pasturage homestead. I would let the present law apply. Let the government encourage these pasturage interests, but do not dispose of the lands, but let the government own them and the people hold them by a possessory title. The land is now held by mutual consent, and it is well enough.

I do not favor the selling of these arid lands. If surveyed and put in the market they ought not to be sold for more than 12½ cents per acre, and if they were sold I would limit the amount of each settler to 5,000 acres.

In this matter of land the timber should be carefully considered. There are two evils resulting from the destruction of the timber; not only the destruction of the timber itself, but the change of climate which it produces. I do not know what suggestions to make on this subject; it is a very serious question.

There is another law that should be enacted and a very severe penalty attached for any person who sets the timber on fire. It would not be a bad idea to survey the timber in tracts of 160 acres, and reserve to the government each alternate section. It will take a thousand years to put this timber back when once it is destroyed. It is a matter of great importance. We lose timber, and we lose our rain. I think it will be better for the district land department to have charge of the timber.

The great fault with the placer-claim law is that it does not limit individuals to a given area, and does not force him to work it. That is the chief abuse. A person ought to be limited to the number of claims they are entitled to, and the matter regulated in the same manner that pre-emption and homestead locations are. As the law stands now a man can take up a piece of land here, and another piece there, and there is no limit to the number of claims a person can enter. They do not work these claims, but just hold them for speculative purposes. In such cases the law should compel them to work the claims. They do not have to pay on the placer claims, and they do not do it. I am in favor of the government being very generous to placer men; allow them to get one piece of placer land, to make the selection of it, but that is all, and then they should lose their right just as they now do in agricultural land cases. I think that the interests of the public and the government would be subserved by permitting agricultural and irrigable lands, such as there are in Montana, to be taken under the present system of location in tracts of 160 acres under pre-emption and homestead filings, and do away with the desert-land act giving 640 acres, the second-bench lands to be held in common for pasturage purposes.

Testimony of Anthon M. Holter, lumber and cattle dealer, Helena, Mont.

ANTHON M. HOLTER testified at Helena, Mont., September 27, 1879, as follows:

I have been in Montana sixteen years. My business is that of a lumber, machine, and cattle dealer. My principal business is lumber and hardware. I have three mills. One mill is located on Three-Mile Creek, in this county, and I have another mill in Jefferson County, and I have half an interest in another mill in Jefferson City, and also a half interest in another mill in Jefferson County. We are probably the largest lumber dealers in the Territory. We cut the timber from the public lands. I have no title and no land from which we cut the timber. We pay the stumpage. A timber agent named Nolan, appointed by the Commissioner of the General Land Office in the winter of 1877–'78, gave us notice that he had to seize our material which we had cut. The agent gave us no chance to pay for it. He put a man in charge of the lumber here, and at the time I went to see Mr. Anderson, the district attorney; he seemed to be considerably in sympathy with us, and advised settlement, but did not know on what terms it could be settled, and wanted me to make a proposition. It went on from day to day. I saw him a good many times, and he advised me not to telegraph my Congressman; but I did send several dispatches, and got answers to some of them. He did not make any proposition to me to settle the matter, and I did not want to make any proposition. He told me from day to day that the matter could be settled. He wanted me to call at his office. He said the matter could be settled, but did not say just how. This lasted for thirteen weeks from the time our lumber was seized, and stopped us doing business. This was much to our injury and detriment. Of course a complaint was in court, but there was no indictment. Before it came to trial a proposition was made by the attorney. His first was that we could settle it if we would pay $10 a thousand feet. We sell the lumber at from $18 to $25 per thousand. At that time we were selling it for less than that. He wanted us to pay $10 per thousand taxes on that, but after correspondence with Major Maginnis, the district attorney then said he had instructions to settle it for $2 per thousand feet. We paid that amount, and that settled it. Besides that we paid the costs in the case. It did not injure us so much, as it was in the winter time, but it cost us between $1,000 and $2,000.

I am well acquainted with the timber land in Montana. It is Georgia pine, spruce, hemlock, and yellow pine. There is no hard wood in the Territory. There is some coal here not yet developed, but I think there is not enough to supply the people with fuel. A great deal of the timber is of small growth. It is not profitable to manufacture into lumber, but it is good for fuel. Not more than one tree in every thousand of the tim-

ber here is fit for lumber. The timber here is of slow growth, as near as I can judge of the age of a tree. I counted one tree this summer, which was 20 inches in diameter, and which had 140 rings. The rings were close together. Where the timber is entirely cut off, in the new growth it makes a vast difference whether the large trees are culled out from where these young trees are growing. We hardly find a large tree for saw-logs but what it is rotten inside. That shows that it grows to a certain age and then dies. Pine occurs more heavily than spruce, and there are very few trees that we cut 2 feet in diameter but what are rotten, more or less. Eight out of ten of them are much damaged from this cause. A great many timber trees are left standing because they are damaged. I think the average age of spruce and pine here is about two hundred years; that is, to the best of my knowledge; I cannot say accurately. I have seen spruce trees here occasionally 4 feet across, but I do not know how old they were. They are not made use of for any purpose; they cannot be cut into cordwood and are not fit for lumber, because they are too knotty. When the timber is cut off it reproduces itself. There is considerable undergrowth here that is growing up into trees. The great dearth here is because there is so little proportion of timber that is fit to cut into lumber, because where the timber grows large enough for lumber the trees do not grow thickly. If it was protected it would grow into fine lumber trees. If the timber was not being destroyed I do not think the timber land would increase, even if there was no cutting out and burning or destruction.

I think the timber of the Territory is getting its maximum of growth. I think all the timber that would grow is grown and is growing now. My reason for that is this: When I first came to the Territory it seems to me that vast fires were more numerous then than now. Lightning does not seem to strike the trees now as it used to do. Since the country has become settled we are able to control small fires in the timber before making headway. The other day a fire got out somewhere in the timber; my men at the saw-mill stopped right at once and worked until they put the fire out. If it had not been that there was a settlement near, that fire would have destroyed much timber. I think that settlement in Montana has had a beneficial effect upon the timber by preserving it from fires. It seems to me a hard question to decide what shall be done with this timber. I have thought of it for years past. I have spoken to the United States marshal on this subject for the last ten years often, but I really have not been able to mature any plan yet. I do not see how the government can put it into the market, for this reason: that there are only two things that timber will be used for, one for fuel, and the other to cut up into lumber for mining and building purposes. This is all it will be used for.

The plan upon which the business has been conducted is like this: A man who has a saw-mill gets the timber adapted for his mill. The choppers who go into the woods cut for both lumber and fuel. They cut over a piece of ground, leaving for fuel what is not wanted in the mill. The timber that is fit for saw-mill lumber is so scattered that when a man plants a saw-mill he generally has to go miles and miles, and take here and there, and allow the rest of the timber to stand. A man cannot buy a large amount of timbered land anywhere near enough to supply his saw-mill. On my land in Missoula County the timber grows in thicker bodies. I would rather buy the logs of individuals than to hunt them up.

Question. If the land was sold by the government to individuals, to be their property for the purpose of cutting the logs, would they not care for the timber more than if they were allowed to camp here and there as they are now?—Answer. No. My reason is this: Probably farmers would be compelled to buy land for fencing, &c. Now, they live miles away. They cannot pre-empt it because the live down in the valleys, and timber speculators would step in and buy it, and other classes of men who do not lay out at night to watch fires. I think it is impracticable to sell the timber land, but I have no plan to suggest as to the disposition of it. I think if the government charges in any way, shape, or manner for cutting wood, that it should be left principally to the land office here. I do not see that the land office here should not have charge of the matter. I do not make this statement for the purpose of avoiding the payment of any just dues to the government. I am willing to pay, but there is one thing I will object to, and that is this: When a saw-mill man wants to put up a saw-mill anywhere he must keep as quiet as possible, simply for this reason, that some man will go in ahead of him and cut the lumber down, put his own marks on it, and make the saw-mill man pay his price for it. It is the usage here that the man who fells the tree owns it. They go ahead of the mill man and fell the trees and own them. There was a grove of timber about 25 miles from here that was cut down two or three years ago. It amounted to between 400,000 and 500,000 feet of splendid lumber. The timber has been lying there ever since and not sawed up into lumber. It is not rotten yet, but it has not done it any good to lie there. This last spring I bought the timber of the parties who cut it. They did not pay any stumpage to the government to cut it; and this is where I do not think we were rightly served when we had to pay the stumpage for those trees. We paid out to the men who cut them down. The parties who cut the timber ought to be compelled to pay the stumpage, and not the purchaser. We bought this lumber last spring. We are sawing it up now. We would rather have

taken the trees standing because it makes better lumber. It is the usual process here to fell timber and then hold it.

Mr. Brown started over in these hills beyond, down on the Benton Ridge, and cut a few hundred thousand feet; that is, cut the trees down. He tried to sell the trees to us after cutting them, but we were not in shape to buy them at the time, and he tried to sell them to others. I offered to lease him a saw-mill if he would saw it into lumber and bring it into town, and I would then buy it of him; but we never made any bargain. That was five years ago. It was good lumber, the trees probably averaging 150 years old. I think there was about 400,000 feet of lumber. He finally succeeded in getting a man to go in there with a saw-mill, and they sawed a portion of it and then they separated, and the rest of the lumber is lying there now. I do not see any reason why the lumbermen should not be compelled to pay a license just like men who are manufacturing whisky. If the register and receiver had charge of the timber land in this district they would know the lands that have been mapped by the surveyor, and would know where the timber lands were that were fit to cut for lumber, and they would give a license to the proper mill men to cut the timber on the public lands, and the mill men could show them where the timber was located that they wanted to get. In that way they could control the destruction of the timber on the public lands. If the government desires to make money out of the timber I think that would be as good a plan as can be suggested. I think the question of timber ought to be settled as soon as possible; but, whatever is done in that respect, I think these people should have due warning beforehand, for this reason, that cord-wood or timber is sold just as though it was seasoned. The parties dealing in it are not making any money because they are getting it for nothing, and competition is just as great as it is in merchandise. The license would have to be paid by the people, and it would make no difference to the dealers.

Q. Has there been any timber planted here?—A. I do not know of any timber planted in this Territory. I do not think timber culture would be a success in Montana.

Q. Have the rains increased since you have been here?—A. I think the rains have increased to some extent.

Q. What kind of country do you consider Montana to be?—A. I have been pretty well over Montana, and I consider it a grazing and mining country. All the land has to be irrigated that is used for agriculture. Agriculture is profitable here, more than in the States I think, because of the markets. I think that one-twentieth is a very heavy estimate for the irrigable land in Montana. The country is largely pasturage because of the grass, and I think the wealth in the future will probably be cattle and sheep. I think the sheep and cattle question is pretty well settled here now by common consent. If the country belonged to me I would sell all I could of it. I think it will be well to allow a man to take as much land as he has stock. I am not much of a stockman, but I think there should be some system whereby the present actual settlers could be protected. We have had some little forerunner of trouble in regard to the water rights. I do not think we have any system of water rights here. There is nothing that is really settled. This summer we entered some land down here, and just as the grain was growing and we wanted the water, somebody else came and cut a ditch and took the water. The strongest man usually gets it. The rainwater has increased slightly, but I have not seen any more acres cultivated because of the increase of rain. There have been seasons that were favorable to raising crops without irrigation, but more that were not.

Q. Have you any interest in mining or any suggestions to make concerning mining matters?—A. I am a large mine owner and locator of quartz lodes. I think it will be well to have a square location in mines. It would stop litigation and quarrels. I am afraid though that the square would not operate well in lode mines. Some suits have originated from the difficulties of ascertaining what is the true apex of a lode. I think the whole business of locating mines ought to be done in the district land office.

There is one thing I forgot to speak of about timber. It has been the practice here to some extent to try to hold timber under mineral claims. They all go to the mining recorder's office, and get entries to lands simply for the purpose of holding the timber. Whatever is done to the timber, I think the timber rights ought to be separate from the mineral. In cases of real mineral location I would give the locator the timber on the top of the claim for mining purposes. Where there is timber on a mining location that is not previously located the timber should go with the land, but where there is a previous claim to the timber that claim should be respected.

I think that the mining laws should be so amended that the attorney in fact could perform all the duties of the claimant himself, after the location has been made. Simply by advertising sixty days a person is debarred from filing an adverse claim; I do not think it is a good idea. I think a person ought to be notified personally as well as by publication. My brother on one occasion happened to see the publication notice in time to allow me to make an adverse filing, otherwise I would never have seen the notice and would have been subjected to loss. I think it would be a good thing to do away with all local laws and use the United States laws.

Testimony of James E. Kauouse, farmer, Meagher County, Montana.

The questions to which the following answers are given will be found on sheet facing page 1.

CENTREVILLE, MEAGHER COUNTY, MONTANA, *October* 1, 1879.

Public Land Commission, Washington, D. C.:

GENTLEMEN: In reply to letter from Department of the Interior asking information upon subjects to be reported upon by your Commission, I have the honor to submit the following:

1. My present occupation is that of farmer and stock-grower.
2. Have lived in Montana thirteen years.
3. Have acquired government title to 160 acres land under pre-emption law.
4. Have assisted many of my neighbors in matters connected with entry of their land under homestead, pre-emption, and desert-land acts.
5. When land office was first opened at Helena, Mont., fees at the office for pre-emption or homestead filing were from $7 in pre-empting to about $15 for homestead filing (uncontested cases). Think it has always required about one year to get returns from Washington in matters connected with Land Department.

The requiring a "non-mineral proof" has added largely to the expense of entering land. I look upon the requirement of publication of notice to miners a big item of expense; as totally unnecessary. In requiring non-mineral proof the department has put the "cart before the horse" so far as the lands of Montana Territory are concerned; for they should all be deemed and held to be agricultural and pasturage lands until proven otherwise, and not *vice versa*.

The cost of a contest in the United States land office at Helena, where parties went from here, forty miles, with three or four witnesses each, that came under my observation was about $200 for each contestant. Decision of land officers here was in favor of the actual settler, but on appeal to Washington he was counted out.

In another instance a party made an entry under desert-land act of unoccupied desert land as defined by the act of Congress. Another party, coveting the land, filed a petition and affidavit with the land officers asking to contest the fact of the character of the land as desert land. The party making entry having no money to spend in contesting, withdrew filing and filed a pre-emption on 160 acres same land. The other party (No. 2) then made application to enter the same land under homestead act. (Application entertained and trial ordered by local land officers at Helena.) To avoid expense party No. 1 sells out to No. 2 for nominal figure. Such cases would seem to indicate some defect in the working of the law under the rules of practice laid down by the Land Department at Washington. It would seem that opportunity might be accorded to whom it might concern, upon the original filing of a notice of intention or settlement, that such settlement once *made of record* at the land office should bar the receiving of applications to enter the same land by other parties until the expiration of the time allowed by law within which to make final entry.

7. The public lands of Montana may be divided generally into mountain and valley lands, or perhaps a better division would be to say mountain, foot-hill, and valley lands. Valley lands vary in width from 1 to 4 miles generally, and lie contiguous to the larger streams of the Territory. An exception is Judith Basin, estimated by one of my neighbors at 150 miles in width. This class of lands is never mineral, and is always agricultural and pastoral—can think of no exception. Have seen most parts of the Territory, but never saw an instance where such lands had any timber, with the exception of a fringe of cottonwood on the islands and banks of the largest streams.

The foot-hills lie between the valleys and mountains proper. They are *pastoral lands*, and whenever they present a level surface (with such grade that irrigation will not wash away the soil) and a supply of water for irrigation can be obtained they are agricultural. They have no timber beyond a few scrubby cedar. Think exceptions to last statement occur principally in Missoula County, where all timber, and particularly cedar, does most abound. The beds of small streams and gulches, before they debouch from the foot-hills, also the "bars" formed on the sides of such gulches, are sometimes gold-bearing—instance: Bannack (Grasshopper Creek), Virginia City (Alder Gulch), Diamond City (Confederate Gulch), Helena (Last Chance Creek), and most if not all placers. The towns themselves are situated on what I have denominated as mountain land, but the pay dirt extends from thence to the foot-hill lands, as described.

Mountain land is timber land, except when laid bare by fires. It is not agricultural and is not pastoral. Upon it are found ledges of gold, silver, iron, &c. It is mineral land. Upon it snow falls deep in winter, with rain in summer, when at the same time the roads of the valley 10 miles away are dry and dusty.

8. By general rule.

9. Don't know that I entirely understand this question, but think that all valley and foot-hill land should be surveyed and plats filed in land office as soon as practicable. Reason: All valley and much foot-hill land is filling up with homes of permanent settlers. See no immediate necessity for the survey of mountain land further

than the running of such lines across the ranges as may be necessary for surveyors n surveying mines or organized mining districts.

10. Think present system a good one. The desert-land act, in wise hands, might be much improved. No suggestions prepared.

AGRICULTURE.

1 and 2. For reply to questions 1 and 2, please see Strahorn's book, "Resources of Montana." Creeks are usually high at commencement of irrigating season, but fail by July when water is still needed.

3. None.

4. All such land as I have previously spoken of as "agricultural." Estimates of its amount vary from 16,000,000 to 25,000,000 acres.

5. Wheat, oats, and barley are the principal crops. All hardy vegetables do well.

6. Seventy-five inches of water, measured under a 4-inch pressure, will irrigate 100 acres of grain in an ordinary season, giving the land three wettings.

7. In this immediate section (Missouri Valley, Meagher County) supply of water is obtained principally from small creeks flowing from Belt Mountains to Missouri River Valley. A few ditches are taken from the Missouri River. The latter are expensive.

8. From observation and experience, think irrigation adds to the fertility of soil. A few farms have been located some 10 miles from the valley, close to the timber line on the mountains. Have raised fine crops. Should think the altitude close to 5,000 feet, or some 1,200 higher than the valley.

9. All water turned into irrigating ditches is exhausted. An act passed at last session of legislature requires *prior appropriators of water* to turn same back into main stream when not needed by them for irrigating purposes upon notice from parties next in order of priority that the water is needed by them.

10. The water supply from small streams (where ditches could be made at slight expense) is all claimed, though early in the season there is a large surplus. In some localities the first settlers recorded at county clerk's office their claims to so many inches of water, in others they made no "record." The right of priority in claim and use of water was usually recognized among the settlers; laws since passed upon the subject of "irrigation and water rights" have been indefinite and unsatisfactory in many respects and while it is a subject of vital importance to the people of an irrigating country there is no subject the legislation upon which is involved in so much obscurity and doubt. An act of Congress is needed defining "rights" hereafter to be acquired and defining and requiring proof of and the placing upon record of all "rights" acquired before the passage of a law on the subject.

11. A low stage of water during the summer usually brings in its train more or less litigation upon this subject.

12. About four-fifths of land in this valley, having no water, is fit only for pasturage.

13. I doubt the wisdom of allowing settlers to enter land in larger tracts than is authorized by present laws.

14. It is not advisable.

15. Whenever the cattle number more than one head to 5 acres the range soon becomes eaten out. This section does not differ materially from others in the Territory.

16. One hundred head, if they subsist solely by raising beef for market.

17. Making a rough guess, would say from eight to ten head.

18. The present season there has been no rain and growth of grass has diminished. A very wet season would make the range as good as ever.

19. No, no.

20. No.

21. There are good-sized creeks from six to ten miles apart furnishing an abundance of water for stock.

22. Can't answer from my own knowledge, but should think about four head.

23. Think answer to question 18 will apply here.

24. They will not.

25. Cattle men complain that they are compelled to move their herds when sheep are brought upon the range they occupy.

26. In 1878, cattle in the county numbered 30,520 head, and sheep 34,617 head. My estimate now would be one-half more cattle and double the sheep. Sheep are herded in flocks of 500 to 2,000 or 3,000 head; cattle are never herded.

27. No suggestions except as to timber and timber lands.

28. The survey lines sometimes have jogs of 3 or 4 rods in them and in some few places corners are hard to find. I also notice in many places that the only mark for a corner is four shallow holes in the ground; these in a year or two will be completely obliterated.

TIMBER.

1. The only timber land is on the tops of the mountains, in this section should think the proportion about one acre to 100 acres of other land, and of the area named less than one-tenth is suitable for any use except fire-wood; kinds of timber are pine and fir.

2. None planted.

3. I would have title retained by United States. Allow actual settlers to cut timber for all purposes except speculation, provide that all title or right to all timbers cut and left as they fall or piled shall if they are not hauled or used within one year revert to the United States and be subject to appropriation the same as standing timber; it would tend to prevent speculation in and a great waste of timber (fence-poles piled and left in the timber will rot in two years).

4, 5, 6, and 7. Enact stringent laws with regard to setting out fire on the ranges or in the timber.

8. The most valued of timber by the agricultural population are the places known as "pole grounds," where poles suitable for fencing grow in dense thickets. The custom has been upon the discovery of one of these places for a number of settlers (any one desiring to) to turn out with teams and make a road to the place for wagons and then to cut and pile such timber as they estimate they will need for a year or two. Their right to the felled timber is recognized by local custom. Much timber is wasted in this way.

9. I think they would be, but it should be borne in mind that United States district land officers as a rule are changed every few years, and their places filled by men having no previous training for the position, often young clerks or "men about town" who have been of service to an M. C. but who have no peculiar fitness to act in a judicial capacity. These remarks will also apply to question 20, under head of "Lode claims."

Not being a practical miner my answers to questions upon mining subjects would necessarily be founded upon hearsay to a great extent. This, together with want of time at present, must be my excuse for closing.

I am, gentlemen, very respectfully, your obedient servant,

JAS. E. KANOUSE.

Testimony of Walter McDermott, mining engineer, Lewis and Clarke County, Montana.

The questions to which the following answers are given will be found on sheet facing page 1.

Answers to questions submitted by the Public Land Commission.

1. Walter McDermott; residence Belmont Mine, Lewis and Clarke County, Montana; occupation mining engineer.

2. Have resided as above for one year and a half.

3. Have located and recorded several mining claims as agent for others under the general mining law of May 10, 1872; and as attorney for others have executed all work and papers necessary to the obtaining of United States patent for two mining claims and three mill-site locations.

4. The opportunities offered in inspecting mining properties and titles and other professional work in Colorado, Utah, and Montana.

6. Am familiar only with practical working of laws relating to mineral land, and defects observed under subhead "Lode claims."

LODE CLAIMS.

1. Experience in Colorado, Utah, Dakota, and Montana, inspecting and reporting on value of gold and silver mines, and in managing same.

2. Chief defect in present laws as to lode claims, and origin of nearly all litigation within my experience and knowledge, is the false assumption that mineral deposits are regular in form and character, occurring solely as a conventional "true fissure vein," and therefore contained within well-defined and easily ascertained boundaries. A large proportion of the most valuable mineral deposits of the West cannot by any means be described as fissure veins; and the attempt to do so in order to apply the present mining laws leads to such inconsistencies as the defining of a great bed of limestone a "lode" within the meaning of the law; and the opposite statement that a detached body of mineral within the same bed is also a vein or lode. No law based on any ideal form of vein or deposit can ever be flexible enough to cover the many different forms of the occurrence of mineral; and any law, as the present, so based must be necessarily fruitful of litigation and injustice.

4. I understand by the term "top" or "apex" of a lode that portion of the lode along its course which outcrops to the surface, or, if "blind," which comes *nearest* to the surface of the earth. Neither the apex, course, nor dip of a vein can always be determined in the early openings.

5. The intended rights of a discoverer are therefore in cases curtailed by such failure to determine above points.

6. Within my knowledge litigation has grown out of this.

7. I have known of such cases.

9. I do not believe outcrops of "lodes," in the proper sense, to be often if ever wider than present legal width of claims under general mining law; but taking the modern comprehensive definition of the legal "lode," which may be stretched to cover a strata of rock several thousand feet in thickness, it is likely to occur.

10. I know of no case, but can readily conceive it with certain surface contours.

11. To the disadvantage.

13. Many discoverers of rich veins and their assigns are. The attack is frequently directed to the portion of the vein dipping beyond the side lines.

14. In my opinion it is utterly impossible.

19. All district mining laws and customs could be at this date very advantageously abolished, and a general comprehensive law introduced in place; but if district records be abolished certain undeveloped unsettled portions of the West will be without facilities for the first discoverers of mineral to obtain titles by the preliminary step of recording. In all settled districts the United States land officers could with advantage to the public keep all mining records.

21. I would make surface lines vertical in depth the true and only boundaries; everything within the four sides on surface or to any depth the property, undisputed, of the owner of the claim, with no right to work beyond vertical planes drawn through the surface lines. It would be necessary to increase the present width to perhaps 800 feet in order on flat dipping veins or beds to give sufficient depth for working, with the right to take the location on surface either wholly on one side of the vein or part on one side and part on the other. There should be more stringent laws as to the proof of a vein being actually discovered before record is permitted. The recording under affidavit of discovery should secure possession to the locator for a short period necessary to prove the course and dip of the vein or nature of the deposit, say ten days, by which time he should be obliged to distinctly mark the four corners of his claim, and no subsequent change of boundaries be permitted, unless the claim is too large as found by regular survey. No arrangement can be made to absolutely secure a first discoverer from locating a claim partially to his own loss, since the nature and run of some deposits take years of work to find out, and later locators have their rights. In regard to the extension on the dip of a vein already located, the record and location should be made avowedly as an "extension on the dip," and in such case proof of a vein existing being impossible, the point of representation by *bona-fide* sinking and exploring should be enforced somewhat as in the case of a "tunnel right" under the present general law. No claims should lap on surface, and in such case, with vertical planes, no litigation could occur in working below.

22. Considering the expense of obtaining patent, the poverty of many prospectors, and the fact that in many places they can do representation work required though unable to meet the outlay for patent, the limiting of possessory title would work some injustice and lead to the custom of letting titles lapse and relocating to evade the law. The benefits at present attending a patent as compared with possessory title are sufficient inducement to insure the change from one to the other whenever the property concerned is of any real value. An immense majority of mining locations are perfectly worthless; but in this connection I would suggest the necessity of some regulation to prevent the custom of avoiding *bona-fide* representation work by relocating property directly after the expiration of the legal limit within which such representation work has to be done.

Testimony of J. H. Moe, register of the land office at Helena, Mont.

J. H. MOE, register of the land office at Helena, Mont., testified, September 24, 1879, as follows:

So far as the voluntary relinquishment of cancellations is concerned I think it should be done here in this office; in fact, all cancellations ought, I think, to be done here; it would certainly expedite the business of settlers. I think the register and receiver should have more authority than they now have; I think they ought to be permitted to subpœna witnesses and perpetuate testimony.

I favor the abolishing of the mineral recorders and putting their business under the district land office, provided that a proper compensation be allowed.

I think the timber land should be surveyed and sold. From my knowledge of the timber lands in this country, I should say it should not be sold in tracts to exceed 320 acres. If they were permitted to buy it, I would allow them to do as they pleased with it afterward; I should charge not less than $2.50 per acre. When I sold a man a mine I would sell him all the timber on the ground and give him jurisdiction over it. I don't think the district land office ought to have anything to do with depredations on the timber land; they are not in a position to attend to it, and it should be done by the United States district attorney; I think it should be attended to by other parties.

I think there should be some method devised by which the decisions of the General Land Office could be communicated to the different district land offices. It takes too long to obtain a patent to agricultural land; sometimes it takes a year and sometimes seven years to get a patent to agricultural land, and for mining patents it takes from sixty days to three years.

In the matter of permitting the relinquishment of land, I think there are two sides to that question. I can homestead a piece here and keep it for five years, and I can go off and enter another one, and so on. In some instances this would injure the ground and in some other cases it would not, but when a man has completed his title I think it works evil to him.

There is a case in Deer Lodge. A man with thirteen children lived on his land but did not file on it. After living there, I think, about six months or a year, his family were all taken sick. His wife died, and he came in here to make his filing perfect. After hearing the case I allowed him to make filing. He had a certificate from the surgeon that his wife had died upon this homestead, and the surgeon advised the removal of his family and house about one hundred and fifty yards to higher ground. He built a house and lived there with his family and continued to improve this homestead all the time, had it fenced, cut hay, &c., and on this proof I allowed the filing entry, but sent it on to the department, and they set it aside, simply because he had not resided on the ground. This is a case where it works great injury. The first filing of the declaration of homestead should not work forfeiture of the right. Notice of filing entry, I think, should be abolished immediately. I think that the forms of the Land Office could be immensely consolidated and condensed to the benefit of the public and department.

Concerning pasturage homesteads, I am not clear about it. I would like to know a little more about it before expressing an opinion.

As regards the proposition that in the matter of land that cannot be irrigated the present homestead law should be extended to enable a man to take up three thousand or more acres, instead of one hundred and sixty, of this arid land for a pasturage homestead, I don't think favorably of the idea, for I think it could be disposed of to better advantage. The land ought to be disposed of in sections of 640 acres, sold at $1.25 per acre. The best you can do for a stockman is to enable him to get a home range, for they will not buy the whole territory if they could. They will only buy enough to control certain water rights.

In regard to the sale of these pasturage lands, it might be well to sell them in small tracts, but I am not in favor of a pasturage homestead.

There is much complaint about finding stakes and boundaries. It is owing to the decay of the stake and the imperfect manner in which the work has been done. I think it is not owing to the insufficient pay, but only to the slouchy work. This imperfect work was done before the reduction in the price of work. I think the reduction of pay has not tended to remedy this defect. I base my views in this matter on the reports and opinions of other persons. I will give an instance. We found last week parties wanted to locate in the Judith district. They went down there to look for stakes and could not find any. They came back here and employed a surveyor for $100 for the trip and his expenses. These surveys were made in 1875 and you cannot find any of them at all. You would not have expected to find any of the stakes placed by one of the deputy surveyors, but those put in by some of the other men you would. I think there should be some means of establishing permanent monuments at the corners of each section.

Surveys are often made too far in advance of settlement. For instance, Judith district was surveyed five years ago, and there is not a settler in that district now. Thus the stakes become obliterated and the townships are of no use. We had eleven townships surveyed out here in the Muscle-Shell Valley, and there is not a filing on it. From the complaints I should not think they receive enough, but practically I have no knowledge concerning the matter.

Question. Do you think that during the last two years the surveys have been made in advance of settlement?—A. I do not think that the bulk of surveys of the last two years have been made too far in advance of settlement. The surveys north of Butte were made, some of them, in accordance with instructions from the department. To have the survey extended down into Willow Creek would be needless.

I do not think the desert-land act ought to be repealed, nor do I think that it has been abused, and inasmuch as the homestead act contains a pre-emption clause, I do not know of any reason against repealing the pre-emption act.

There is another point. I think the register and receiver ought to be allowed to take testimony, thus saving much loss and trouble to the settlers. I believe in extending the same rights to the final pre-emption as are extended under the homestead act.

In placer claims I think there ought to be a limit to the final entry, but in lode claims I do not think so.

In the matter of the sale of delinquent rights in mines, we are governed by section 2324 of the Revised Statutes. We have no local law on the subject. In connection with this local mining business I think the law ought to be amended so as to allow an adverse claim to be filed by the attorney in fact instead of by the person himself. The law should be so amended that the attorney in fact may be allowed to do everything—the notice of intention and posting included. It has been so here until this month and was never questioned. In certain cases before this office application was made by the attorney in fact on behalf of the parties, then absent in the East, to transact the business of their clients. The Land Office at Washington attempted to set aside the action taken by the local office here, the Commissioner ruling that attorneys in fact could not appear for parties who were absent. I do not think the Secretary of the Interior will sustain the Commissioner's office in its ruling.

There are no conflicts here between cattle and sheep men, although I know very little about that. My opinion is only from hearsay. Neither am I familiar with the system of irrigation and its workings in this district.

I think there should be more rulings made by the departments, and I think they could give better instructions.

I know of no better way of disposing of the public land than through the register and receiver. I think the present rectangular system of disposing of the land is simple and effective.

I think the register and receiver of the land offices should receive a salary instead of fees.

The additional homestead act of March 3, 1879, should be amended, so as to allow parties to take an additional homestead, though not contiguous to their original entry. There should be a register and receiver's fee of $6 in each case.

The timber-culture entry act of June 14, 1878, should be extended to the Bitter-Root Valley lands. There is a separate cash entry kept of sales of those lands, and the proceeds go to the Flathead Indians. By the act of February 11, 1874, the homestead privilege was extended to these lands.

As regards surveys, I think there is a point. Where there are no surveys between distant surveyed points, I think that the rectangular method should be used to locate points for the settler. I think there is one such case now, where it will be necessary to run 20 or 30 miles of chain in order to locate a point.

There is another idea that seems to me could be carried out. It is to have a portion of the appropriation of this district set aside for surveying those small fractional townships which are outside of the regulation survey.

There have been 277 entries made since April 1, 1877, and most of these were along the streams. If the square location will destroy litigation I am in favor of it. It would, of course, work a hardship to some persons. We have 522 mines patented in this district. We have had 722 mineral locations. There are 200 applications in this office from parties who have not made their final entries. This is owing to a defect of the mineral law, as that does not require miners to make their final proof in a specified time.

In regard to placer claims, there is neither a United States nor Territorial law compelling a man to complete the entry. They file the application and leave it. We have about 100 placer-claim applications. They ought to be compelled to make their final entry. They just make their claim and hold it. They do not work it. With lode claims it is different. United States law gives them possessory title, and if they do not choose to have a patent issue and get an absolute title they need not. It would be better for all parties if they were compelled to make final proof; but if a person chooses to hold it under a possessory title he can do so. It is absolutely impossible for a deputy surveyor to make accurate returns concerning the mineral character of lands. He is better able to determine the character of the soil. A deputy surveyor sees a cropping of coal, and on the strength of the cropping he returns all the land in the vicinity as coal land. I think the best way to determine the character of the land is to determine its character when you make its final proof.

I think the trouble regarding inaccuracies in survey maps is that the clerks are slouchy. They do not take the trouble to put down the topography as returned by the deputy surveyor.

I think that about one-sixteenth of the lands in this district can be irrigated. A large portion of the lands surveyed in Montana are simply arid land. We have 490 township plats in this district, and of these there are many of them that have not a settlement in them. That land should never have been surveyed and subdivided.

Testimony of John T. Murphy, Helena, Mont.

HELENA, MONT., *September* 26, 1879.

1. John T. Murphy, Helena, Mont.; merchant, miner, and cattle and sheep raiser.
2. Have lived in Montana Territory sixteen years.

3. Have filed on 640 acres land under the "desert-land act;" have not yet sought to acquire title.
4. Know nothing as to the practical workings of land laws.
5. Have no personal experience or knowledge.
6. Am not sufficiently conversant to venture an opinion.
7. The public lands of Montana are agricultural, pastoral, mineral, and timber lands, and by far the largest area being pastoral.
8. Believe that no general rule would answer for the whole Territory, nor do I think the several classes of land could be fixed as to character by geographical divisions. The pastoral lands in our Territory could be defined very easily as being such lands devoid of water for irrigation, or very difficult and too expensive to put water upon them, and in not having any timber, or but little, upon them. The agricultural lands in Montana Territory, as a rule, lie contiguous to the pastoral lands, and either have water upon them already, or can have water put upon them at not too great cost.
9. Concerning agricultural lands, I think the present system of parceling good enough. Pastoral lands, I think, should be disposed of by the government in larger parcels.
10. Think the existing land system good enough, except in regard to the pastoral lands. These, I believe, would bring in a revenue to the government if put upon the market at a low price in large parcels; as now, under the present system, they are not settled upon nor located at the present price required for them, but are used by the stock owners, and without revenue to the United States, Territory, or county.

AGRICULTURE.

1. The climate of our Territory is, in my opinion, good; the rainfall not sufficient in all years; length of the growing season short; snowfall not excessive; a fair supply of water in most sections for use on such lands as can be reached cheaply.
2. From the 15th of May to the 15th of June generally, and in large quantity. As a rule the greater supply of water comes earlier than when most needed for irrigation.
3. A very small proportion, and that which can is cold land and not good for cultivation on account of early frosts.
4. Perhaps one-twentieth.
5. Wheat, oats, barley, rye, and most of the vegetables.
6. Am not sufficiently informed.
7. All the streams flowing into the Missouri River on the east side and the streams flowing into the Columbia River on the west side of the mountains.
8, 9, 10. Am not informed on these three subjects.
11. Conflicts have arisen among the farmers in the Prickly Pear Valley, Lewis and Clarke County, in relation to water rights during dry years.
12. Fully three-fourths.
13. To some extent perhaps, but limited; think not less than three thousand acres nor more than five.
14. Think to actual settlers pastoral lands should be sold, and quantity not limited.
15. Think perhaps twenty acres in some sections of the Territory, and more in other sections.
16. Cannot answer, not knowing.
17. Do not know.
18. Think the growth of grass has diminished.
19. Cattle ranges are not fenced; do not think it safe to confine cattle in winter by fences on the range.
20. The quality of herds could be improved by being confined to specific ranges, but the same result can be obtained on the range at large.
21. The Crazy Mountains, lying between the Yellowstone and Musselshell Rivers, furnish the water for the range I allude to especially.
22. Am not very well informed on this point.
23. Think the growth of grass has diminished.
24. Cattle do not like to graze on same lands with sheep.
25. No conflicts have arisen between sheep and cattle owners on my range, there being as yet but few sheep there.
26. On the Musselshell Range, Meagher County, I think there are 40,000 head of cattle and about 20,000 head of sheep. Sheep are herded in flocks of about 2,500 head, and the cattle run at large; there being perhaps forty owners for the 40,000 head of cattle and say six owners for the 20,000 head of sheep.
27. Have none other.
28. Do not know.

TIMBER.

1. The timber land is confined to the mountains. The different kinds of pine.
2. No timber is planted.
3. The timber lands in Montana Territory are on the mountains, and worthless ex-

cept for the timber. Think these lands or the timber upon them should not be sold or leased, but left free for the uses and benefits of the people at large, who are settled in the towns and valleys, for the following reasons: If sold or leased only a few favorably located tracts would be leased or bought, and these by speculators to sell to the miners and other settlers; while the great area of such lands would not be bought by any one, but would be used nevertheless, and without revenue to the government.

5. The second growth, I think, is of same kind as now exists; growth slow.

6. A great deal of timber is destroyed by fire, and as a rule resulting from carelessness; think it next to impossible to prevent them entirely.

7. Do not think timber has been unnecessarily wasted in our Territory.

8. Am not informed.

9. In some localities, yes; in others, no.

LODE CLAIMS.

While I own lode claims, I have too little general information on the subject to attempt to answer the various questions.

Very respectfully,

JOHN T. MURPHY.

Testimony of John T. Murphy, stock-raiser, Helena, Mont.

JOHN T. MURPHY, Helena, September 25, testified as follows:

I have lived in the Territory since 1864, and I understand it pretty thoroughly. I am in favor of a pastoral homestead. I, with others, located on the Musselshell, where there are about 40,000 cattle, having about thirty owners. We range in the valley of the Musselshell, on both sides, immediately north of the Crow reservation. The people that we keep there are annoyed a great deal by bands of Indians wandering over there. They claim to be Crows and Gros Ventres. They are reservation Crows, but really live there on the river. They number over 1,000 when they are on the reservation. In the winter time when they want cattle they catch ours. This is not the worst of it. There are hostile Sioux Indians who come in there from British America and from Fort Peck Agency. Whenever they are away from their reservation they are hostile; they will steal horses and cattle. Right here, about the 12th or 13th of June, not more than eight miles from the corral, a band of Indians jumped two of our men and got everything they had and shot at them. Last winter they killed a good many cattle and ate them. It is a material matter and a fact that when the Indians are around there we don't know whether to allow them to come up in friendship or shoot at them on sight. I know of many people who have been killed in that way. The Crows are not supposed to be hostile; they are supposed to be friendly Indians. But that country is supposed to be white man's country, and they ought to be kept out of there; they should be located where they belong, on that reservation. The River Crows have never been placed on the reservation, and those who are on the reservation are never restrained at all; they let them leave the reservation. They camped at the mouth of the American Fork last year. It is not an uncommon thing to have men killed and nobody knows who did it. A very large portion of that reservation does them no good. It is not a game country, and they have not got to raising any cattle, so that they do not want it. They ought to be made to wear some uniform or something, so that we would know what they were. Right at the corral there came up a band of Indians who we did not know, but we supposed them to be Crows and Gros Ventres; but since then we have found them to be Sioux. The chances are that these Indians would have killed the whole party; but at the time we did not think about it, but supposed them to be Crows. They said that they were Crows. There was a negro with them, with his hands and feet off, and he said the Sioux Indians cut his hands and feet off when he was a boy, and the Crows took him and raised him and he had been with them ever since. We learned since then that there never was such a person among the Crows. The Crow Indians never have anything to show who they are.

Testimony of Benjamin Franklin Potts, governor of Montana Territory.

BENJAMIN FRANKMIN POTTS, governor of Montana Territory, testified at Helena, Mont., September 27, 1879, as follows:

I should not think this was entirely an agricultural country. It is only *agricultural to a limited extent.* There is no land here that I can point to as really agricultural land without irrigation. There has been crops raised here without irrigation, but they are

exceptional. I think one-twentieth for irrigable land is a liberal estimate. There is here much land on the mountains which is irrigable if you could get water on it, but this cannot be done. The bulk of the land is mineral and pasture in character. I believe that good farmers—I mean skillful ones—could raise all the agricultural products in this Territory, and that such products would sustain a million of people.

The timber lands are not now being so largely denuded of timber as they were. They have never been trespassed upon to the same extent as in other Territories. Then the Indians very often set fire to the timber, but now that they are on reservations the difficulty is somewhat removed. If they were kept there we would not have so many fires. Prospectors are more careful and they seldom set the timber on fire. Settlement here has tended to protect the timber to a great extent. I think it ought to be sold or protected. I would survey and sell it. If the ownership was in individuals it would be better taken care of. There would be great difficulty in protecting this timber or in adopting a system that would protect the land.

Private timber land will protect itself, but the difficulty is to protect the government land. In case alternate sections were sold, the settlers would take the government timber and preserve theirs. I think the timber would be better protected if it were placed in the hands of the register and receiver. This thing of sending foreign timber agents around is very obnoxious to the people here. I think $2.50 per acre would be little enough for the timber land. There is enough timber here for the supply of the people for a long period.

There is coal in the Territory, but it has not been very much developed yet. There is coal along the Missouri River, and there has been coal discovered here in the mountains.

I think the government had better sell the pasture lands, so as to protect the actual settlers and cattle raisers. I favor the pasturage idea of 3,000 acres to each individual. If this country was divided up into homesteads of 3,000 acres it would sustain an enormous population. The object is to provide for actual settlers. I think the sooner the question is settled the less difficulty there will be between the different interests of the country in the future. If the men had large ranges they could move the sheep and cattle from one part of the range to another, and thus keep the grass always in good condition. If a man owns his property he will take care of it and improve it; but if he is subjected to inroads by other persons he will not do so.

I think if these lands are worth anything they are worth 25 cents per acre. I should rather have the land sold outright than to have this method of living on it, and when they come to prove up they will lie about it and perjure themselves; so I think it would be better for the government and everybody else to sell the land at low rates.

I think the general law of the United States ought to govern in all mining locations. And I think the recording of mining claims ought to be put in the hands of the register and receiver of the district land offices.

Some years there is more rain than others; but probably the average for three years is not much greater than it was formerly. I do not believe in waiting on climatic changes to effect the sale of these lands. Life is too short for that.

The great need of Montana is people.

The theory of the government land system ought to be so it will meet the requirements of the most people.

Agriculture pays for the number of people engaged in it; but farmers cannot sell the surplus they raise, for there is no outlying market at present. There is not enough people. Flour is cheaper here to-day than it is in Ohio.

I think these Indian reservations might be curtailed with safety and the land used for settlers.

The Crow reservation would make an empire as large as all France. About one-third of the Territory is taken up by Indian reservations. The area of the Territory is about 143,000 square miles. The Crow reservation, the Blackfeet reservation, and the Flathead reservation are the best lands in the Territory, and I think they could be curtailed three-fourths and yet the Indians have plenty of ground. They are of no value to the Indians at all. There is no game, and there is much more land than they will ever need to use for agricultural purposes. These Indians have to be fed; these great reservations are great drawbacks to settlements. The Indians will not allow the settlers to drive their cattle, while on the way out of the Territory to a market, across the reservations. In the winter Indians go out of their reservations and kill cattle. They are not kept upon their reservations, although they have a rule that the Indians are not permitted to go off it unless on permission from the Interior Department. Whether the Interior Department gives them permission or not they go.

There has been a great deal of causeless litigation here. There is less now than heretofore, because the United States law applies here now. There are very few mineral districts made in here now.

Sheep and cattle will, to a certain extent, range on the same ground. If the range is short, the cattle go off, while sheep can do better on a short range.

I think it will take less than 30 acres to range one beef. A man can take 10 acres,

fence and sustain a beef, but oftener I think it will take 20. Five sheep, I think, are about equal to one beef. If sheep and cattle are put on the same range, the sheep will eat the grass off very close, but you move them off on to another range, and in a short time the grass grows up, and the cattle come on where the sheep have left, and you cannot get the cattle away from that range at all. It appears they prefer the grass grown up after the sheep have left to that on any other kind of ground.

I do not think there is that conflict between cattle and sheep owners that people represent.

There is really no law here as to the water right. I think there are some laws, but they are all in a chaotic condition. The courts have been deciding this question again and again, until they are all at sea on it. I think it would be better if there was a law of Congress on the subject.

I would sell the timber separate from the mines, in order to save timber; but if a man has bought a mine, I think he should take the timber on his ground for the use of the mine.

Settlers complain that there are no monuments or marks to indicate where the public survey is in three or four years after it is made. There is more land surveyed here than can be sold for years to come. Land has been surveyed where it ought not to have been.

I do not favor any change in the rectangular system. I think it is a good system, provided it is properly carried out. I think there are changes which, if made, would be a remedy to many little evils. I think the surveyor-general's office is a good thing.

The forms of the land office could be simplified and condensed, and attorneys in fact should be allowed to do all that the claimant can after he makes his original location.

There is another thing. The whole system of acquiring title to the public land needs to be simplified, but with this circumlocution it is almost impossible for a man to get anything.

There is another thing that ought to be done. This classification of the land should be more carefully made. If it is agricultural land and set down as mineral land an applicant is put to heavy expense to prove it is non-mineral in character.

In consideration of the fact that two or three railroads are coming in as rapidly as they can, I think these questions ought to be taken hold of by Congress and settled, as they will materially affect the prosperity of this country.

I think the real wealth of the Territory is stock-raising, and the bunch-grass is worth more than all the mineral of the country. The hills are covered with it to the very tops. When I came here nine or ten years ago they did not raise any wheat; they had to bring it all here. It was not believed that we could raise wheat that would make good bread. We had to pay $10 for a sack of 90 pounds in those days. We can grow all the cereals and I think can raise all of the fruits and a very fair crop of corn, while we beat the world on potatoes.

The highest altitude of irrigable land is not more than 4,500 feet, but I think it will take a great deal of capital to irrigate these large bodies of land, and I think the government should assist irrigation in every possible way.

There is a tract of 5,000,000 of acres that could be irrigated by aggregating capital or by large companies.

The manner in which placer claims are held here is all wrong. If a man makes a filing for a placer or lode claim he ought to pay for it within a reasonable time. There ought to be some limit. The development of the best mineral portions of this country has been retarded by persons who have made placer claims just for speculative purposes, and by not paying for and working them.

Testimony of Frank P. Sterling, receiver of the land office at Helena, Mont.

FRANK P. STERLING, receiver of the land office at Helena, Mont., testified as follows:

I have read the statement of Mr. Moe, and, with some exceptions, I concur in it. I do not concur with him in the matter of disposing of lands for pasturage homesteads. I think in certain localities these arid lands should be disposed of at a nominal price for pasturage purposes. I confirm the complaint made of bad work in the matter of locating stakes from my own personal observations. The number of applications that come into the department to amend homestead filings is evidence of the errors committed in the matter of surveys.

We have a great deal of trouble in determining the non-mineral character of lands; and we have a great many such cases which cost the settler a great deal of money—from $15 to $25—which, of course, he has to pay. I see no way to determine the non-mineral character of lands except by receiving testimony on that point. It is all guesswork except where testimony is taken.

Testimony of Rowell H. Mason, surveyor-general of the Territory of Montana.

ROWELL H. MASON, surveyor-general of the Territory of Montana, resident at Helena, testified, September 24, 1879, as follows:

I have been surveyor-general for two years; I was appointed in October, 1877. I believe thoroughly in the rectangular system. I think it is the one best adapted to the wants of the people and the most economical to the government in every way. I think that the ruling of the department—I do not know whether it is based upon law or not—that all lines of surveys should be discontinued at the point of their intersection with any military reservation, should be modified so as to permit the extension of base and standard and meridian lines through the reservation for the purpose of securing more perfect uniformity in the surveys. I think, too, that the entire country should be surveyed into townships, but perhaps not subdivided. (I may say here that I am giving you the ideas I have suggested in my annual report.)

I believe in the value of topographical knowledge of the lands. This, again, would more than equal the cost of surveying; and in making these surveys the deputy surveyor should return full field-notes. He should describe the land in a township, as far as practicable, and examine and classify it as to whether it is mineral, agricultural, arid, &c. He does not virtually do that now as fully as it should be done. For instance, a deputy in turning in his field-notes specifies the character of the soil as simply first, second, or third rate. Now, that classification should be increased, and it should be defined as to what constitutes the first class, second class, &c. I think the classification can be reached through the deputies in subdividing. The field-notes of the deputies generally are not of such a character that the surveyor-general will be able to judge of what lands should be subdivided. It might possibly be advantageous for two or more lines to be run so as to divide a township into quarters, for if that were done I think the classification could be made quite complete. Where exterior boundaries are run, if at the same time they run east and west and north and south lines through the townships in subdivision, these lines would have been already run.

Question. Do, or do you not, think that triangulation would be valuable in cases where mountains or large areas of useless grounds are involved?—Answer. Yes; I certainly think so, if they were paid for it. The object would be accomplished just as much as if it were chained, without the cost of chaining. My idea is to keep up a complete and whole square system of surveys. The worthless tracts might be triangulated, so as to avoid chaining. I think that the whole country ought to be surveyed in some way or other. These irregularities in the mineral surveys are due to the fact that the surveyor has nothing to tie to.

I think that the rate of compensation for surveys should be increased. I would suggest for section lines $8, for township lines $10, and for meridian, standard, and base lines $12. Meandering lines should be the same as standard lines, for the reason that they are the most difficult lines to run of any. You take meandering along a river and through brush. I have had a great deal of experience with them, during the last two years, in surveys along the Yellowstone. I have personally inspected a large number of these surveys, and I have been with a party when meandering, and have run lines, and I know many cases where there were 30 acres between two section corners, and sometimes as high as 64 acres. Now if the deputy surveyors could get the *locus* of their contracts executed and could work without any delays or hinderances, the present rates would afford them fair compensation for their own labor. But, in the first place their personal risk should be taken into consideration; and they are exposed to constant loss, not only from the weather, but from their stock being stolen by Indians, and from their men leaving them through fear of the Indians. Twelve of my deputies have suffered considerably from these causes. The argument might be made that surveys should not be made in dangerous localities; but in this district, in the first place, they are all dangerous, outside of settlements, and in the second place it is the policy of the government to have these lands settled. The people are on them, and they require the surveys. I do not think there has been a subdivision in the Yellowstone in the last two years in which there is not a settlement.

Q. Have your deputies used the solar instruments?—A. Yes sir.

Q. Do you think anything would be gained by supplying them with aneroid barometers?—A. Yes, I think there would. I think the timber lands surveyed should be sold in tracts of 320 acres, at $2.50 per acre. I make no distinction between subterranean rights and surface rights. Another point: I think the rule restricting from sale the timber on the non-mineral lands should be abolished. I think the non-mineral timber lands should be surveyed just as much as any other lands. For instance, in a great portion of the timbered section of this Territory there is mineral underneath it, and I think that the timber should go with the mineral lands; and I think that the timber lands should be subdivided and the timber should be sold, irrespective of mineral, for the reason that this timber is near mills and mines, and I believe that it would be purchased by mill and mine owners for their own protection, and to have it near them so that they could get at it.

There are many fires in the timber in this territory, but to my knowledge there were none this year. We have spruce, pine, and fir timber here. I consider this county very well timbered. From information I know there are large bodies of oak on the upper waters of the Tongue River. There is some white and black ash down toward the other end of the territory.

In regard to the pasturage lands, I think they should be surveyed and sold in limited quantities. I do not believe in the theory of the pasturage homestead. I would sell them at not more than 50 cents an acre, and I think they might be sold at 25 cents an acre. It costs 4 cents to survey them. I should think four sections would be enough for one person.

I think the idea of permanent stakes at each corner of every township a very good one. In Judith district, when the survey stakes were put down there the Indians came and dug them up, supposing there was something cached there.

Another point in regard to the inspection of surveys: I think that the surveys should all be inspected by the surveyor-general whenever he can, and if not, by some competent person to be appointed by him. The inspecting surveyor should take out a party—as many as he wanted—not only one man but he should have his chainman and flagman, and he should run the lines and examine the corners and see generally whether the work was properly done. At the same time there should be a small appropriation made for that purpose. I don't care how good a deputy surveyor is, his work would be better done, especially that part performed by his assistants, if it is known that a thorough inspection is to be made.

Another point: I think an appropriation should be made to allow the surveyor-general to make preliminary observations of different parts of the district in order to determine the *locus* of the surveys. That would not be as important if this system of surveying township lines, and especially running cross lines throughout the center of townships, was carried out; but unless this is done I think the surveyor-general should have an appropriation as suggested. According to the present system the surveys are located either from the personal knowledge of the surveyor-general, or reports of deputy-surveyors, or in consequence of petitions. The first two are good as far as they go, but there is the danger that deputy surveyors will report in favor of surveys in regions where there is good running, and where there has generally been petitions from persons in the locality. The office has no knowledge as to the necessities of the case, and cannot tell whether that survey should be made or not. There are persons who want a survey made, and you survey a whole township, when there won't be but one section that is fit for cultivation. The difficulty is that the appropriations made for surveys are too small. My appropriation for this year has already been used up in surveying the tracts that are needed, and we have applications for surveys, and we have no money to make them.

I think the compensation allowed the surveyor-general is too small. The appropriation for clerical hire is also too small. During the last fiscal year I performed a great deal of clerical labor in addition to the duty required of me, and I kept an account of the work that was done in the evenings that I cannot pay extra for, and I worked with my clerks for nearly four months during the year in the evenings, and got the work up.

I do not object to the present method of having mineral clerks. There is this one thing about that, the mineral clerks should receive pay for only the time they are actually employed on mineral work; and whenever the regular clerks in the office are employed on mineral work they should be paid out of the mineral fund for the days or parts of days they are so employed. While I am frank to say that I have not followed this system, I have paid the mineral clerk for the time he has been employed out of the mineral fund, and the other clerks out of their fund. Sometimes there will be a press of mineral business and I will put all three of the clerks on that work; and then again there will be the public surveys, and I will have all three of them at work at that. I think the rule should be modified or revoked.

The salaries paid the clerks is sufficient, in my judgment, but there is not appropriation enough to allow a sufficient number of clerks. The office work requires more clerks than I am willing to pay, and the reason is that there are a great many hurried surveys and I have not clerks enough to keep the work up as people demand it should be kept up.

Q. Under what local mining laws do you work?—A. There are no local mining laws here; all use the United States laws.

I think there should be an inspection of mineral surveys allowed. Mineral surveys should be inspected in each district for the purpose of accuracy, in order that they might determine the quality of the surveyor's work.

I think it would be a convenience to the public if the surveyor-general had a seal and could furnish a certified copy of documents in his office on request. There is no seal for the surveyors-general of the land offices. I think they should be allowed to charge a compensation for the records they furnished. That money might be turned over to the department. There are a vast number of records in the surveyor-general's office which the district offices do not have, and therefore the people have to get them from the surveyor-general.

I think there should be some responsible representative of the land department here in this district, and I believe that the best way of transacting the public business would be by some responsible head (in the different States and Territories), and I believe this the best way to satisfy the public, especially in mineral cases. If the business is to be referred to Washington there must be delay.

There have been 75 mineral surveys since 1868.

Testimony of Granville Stuart, Helena, Mont.

GRANVILLE STUART testified at Helena, Mont., September 26, 1879, as follows:

I think I can safely say that this will ultimately be an agricultural territory. I think that about one-twentieth of the Territory is capable of irrigation—that is, by the streams, and I think that can be largely increased by artesian wells. I think there is no doubt about that. The nature of the underlying rock is such as to enable them to utilize artesian wells. I am satisfied that they would be a success in all the valleys of the Territory. Fully three-fourths of these lands are pasture lands.

Montana is an exception to most Territories in that respect, for the mountains are covered with grass to the very tops, except where the timber is. Mount Powell, very near Deer Lodge, by barometrical observation has been estimated to be 10,224 feet, and the timber grows on it to about 8,500 feet. That seems to be the altitude at which it will grow on the mountains generally. The timber is what we call red fir. It varies in localities in this vicinity. There is a large amount of what we call yellow pine, which grows to about four feet in timber. It is what is known as the long-lived Georgia pine. The red fir makes good building material, most equal to hard wood. It is objectionable for planks, because it splinters in sawing. There has been very little unnecessary depredation on the timber here. There has been a great and enormous destruction by fire. Our Territorial laws are very stringent; the penalty is a heavy fine, and it is a penitentiary offense to let fires begin through carlessness. No one has yet been convicted. In early days there were two causes for fires: one was the Indians traveling through the country, and for the purpose of driving the game they would set fire to the grass; and the other cause was the universal "prospector." The prospector went everywhere and was perfectly reckless. They would sometimes set fires gratuitously, but usually by leaving their camp-fires burning by old logs. The fires are decreasing, because the Indians are confined to reservations, and much less prospecting is going on. It is now confined to the lode claims, and less placer prospecting is going on. I think about one-fourth of the land of Montana is timber. I cannot think of any system by which these lands may be disposed of. I think it would be much better cared for if individuals owned it, but the trouble here comes in, how are you to discriminate. The timber that stands on the lower portions of the mountains, being accessible, is much more valuable than the timber farther back. Most of our timber will necessitate road-building to get it out. It seems as though the price should be in proportion to accessibility. I don't think the timber ought to be cut off, because I think it would affect the climate very much, and it would take many hundreds of years to restore this timber. It may have been eight hundred years in forming. The smaller growth of white pine timber would perhaps grow in a hundred years. It never reaches any large size, but is excellent for fencing, mining purposes, &c. I think the timber question would be better administered if put in the hands of the local register and receiver. My idea would be to have the register and receiver devise some system of protecting it. The present system is very crude, and great injustice is worked upon our citizens by those timber prosecutions here last year (meaning prosecutions instituted under the Interior Department for depredations on public timber) in that they had no opportunity to acquire title to this timber whatever, and it was absolutely necessary that we should use the timber. We could not exist without it. They came and took snap judgment on every one. There was no unnecessary destruction of timber. It was cut for actual use and consumption. We never exported a foot of it. It was strictly for local use. We felt ourselves aggrieved by being taxed under the circumstances. It struck us in this light: we thought it was better for the government to have this timber used to help build up thriving enterprises here in the wilderness than to have it lie idle.

There is no timber culture here yet. There seems to be some difficulty in getting varieties that are not indigenous to flourish here, and in fact indigenous varieties do not seem to succeed very well. It is a question if timber culture will succeed here.

Question. Have you any suggestions to make concerning the pasture lands?—Answer. I have not given the pasture homestead proposition any consideration, and I cannot say much about it without reflection. These lands have been held in common. One hundred and sixty acres are worthless for pasture purposes. I am inclined to think it would be advisable to create a system to allow a man to acquire land in proportion

to the amount of his stock. I think it would be but just and right for a man herding a large band of cattle to be permitted, on the passage of such an act, to take land in excess of a pasture homestead, in proportion to the stock he has there, by purchase or lease. I think 10 cents per acre would be enough for this land.

Q. Have you had any experience in mining?—A. I have had some experience. I think the square location would do away with a great deal of litigation, and would be much better than the present. Under our present system the oldest location takes the whole ledge. It seems to me it would be better to divide it up among a number of people. I think it better that the county recorders should be abolished, so far as the United States lands are concerned, and that the claimant should make his first filing right here in the office of the register and receiver. I see no reason why there should be any difference between mining claims and homestead and pre-emption entries. There is a deplorable license in the description of mining claims in the county recorder's office. I think the system would be very much improved if it were put in the hands of district land officers.

Q. What is the condition of the water rights in Montana?—A. The water rights in this country are in the most chaotic condition. I stated at the last session of the legislature that this was one of the most important questions that would come up, and that some system should be devised to protect the settlers. There is a sort of priority right here; the man who comes and takes up the water first is supposed to have the first right to it, and there is no limit to it. He can take as much as he likes. The committee to whom this matter was referred came back and reported in four days that there was nothing better could be done. In certain localities the water is taken up, but in a great many localities a very little is yet taken up. I think about two-thirds of the water supply is yet common property. I think irrigation will never amount to much here except by companies, and I think the government ought to aid them by giving them grants of land. It is a system that must be incorporated. It is too great an undertaking for individuals. The land will not be worth the money it takes to put the water on it. These great rivers can be taken out by companies and made valuable, thus rendering the land capable of sustaining a large population.

Most of the bench lands are the very best of soil; and in many places the soil is of a very superior quality to the very summits of the mountains. I am satisfied that this will be a fruit country. If sheltered from the north winds, all the hardy variety of fruits will grow here, cherries, apples, and small fruits, such as strawberries, &c. I think this question should be settled at once, before any more land is occupied and the population becomes any greater; or, in other words, before there is more vested rights.

Q. Have you had any mining litigation here?—A. Comparatively little mining litigation has yet been instituted here, but that is probably owing to the wide expanse of our country and the few people yet in it.

Q. Is there much complaint of the rectangular system of surveys?—A. There is much complaint of the rectangular system, on account of the stakes rotting away. I believe it is a good system, but after three or four years it is difficult to find the corners, as the posts have disappeared. The surveys that were made in the prairie region, the stock rubbed the stakes out of the ground, and the mounds washed down and disappeared, so that there was nothing left. I think the corners should be made of stone, and I think there should be monuments of permanent material on every fourth township corner. They should be made of sufficient size to find without difficulty. Triangulation should be used to bridge over mountains and undesirable places. I have no practical knowledge on the subject, but I think it would save much time and labor.

Q. Have there been any climatic changes here?—A. Apparently the climate is changing. It seems to be wetter, and the seasons warmer, but the snowfall is about the same, taking the average, and the supply of water has very little decreased, if any. As the greater portion of our rain falls in May and June, the rain comes at a season when it is needed for irrigation. Sometimes towards the close of the season of irrigation the water becomes very scarce, but at the time the crops are growing then is our greatest supply of water, say along the latter part of June and July. We raise all the cereals, without exception. The Jefferson, the Bannock, the Gallatin, the Beaver Head, the Bear, the Dearborn, in fact all the rivers in this country, can be taken out for irrigating purposes.

I do not think the Territory is yet overstocked; not at present within one-quarter of its actual capacity for stock. That is a very moderate estimate.

I think in mineral claims a man should be compelled to pay up sometime, and that he should not be allowed to hold mineral claims without paying up. I think there should be a limit. Three years would seem to me amply sufficient time for a man to acquire title after location. I do not think simply a possessory title ought to continue for any more than that length of time.

There is another thing I would call attention to, and that is in regard to the old placer mine act. That was a great injury to Montana; it sent our population to other gold fields. There was a vast amount, comparatively speaking, of our placer mines that were

patented and could not be worked. They were held for cheaper labor, scientific apparatus, &c. They drove our placer mining people out of the country. There are miles of good placer mines that to-day would support thousands of men by mining them. They are held by monopolies and companies. They were taken up under government patents but were not worked at all—were held for speculative purposes. That law worked a great disadvantage to the people of Montana. Our yield of gold fell off wonderfully. There is at present any number of government patents, very rich placer mines, that will ultimately yield much gold. Every place that was not known to be worth $3 per day was taken up and held for speculation.

We have other kinds of land here—mining, pasture, and timber land. I think we ought to make laws that would protect these interests. The only changes that should be made should be those that would affect the settlers and the coming population of this country.

There are some places away up on the sides of the mountains where you can grow fruits, but they do not mature until late. In Deer Lodge County, which is also at a high elevation, they have fine gardens. In my opinion the farm land that can be reclaimed is amply sufficient to support a dense population; that is, after the waters have all been utilized and artesian wells dug.

Testimony of Willis Ball, civil engineer, Beatrice, Nebr.

The questions to which the following answers are given will be found on sheet facing page 1.

BEATRICE, NEBR., *September* 30, 1879.

Public Land Commission, Washington, D. C.:

I will now reply to some of the questions asked in the inclosed circular. I will consider the first ten only.

1. Name and business as shown above.

2. Seven years.

3. I have acquired 160 acres of land in this State under the "soldiers' homestead act."

4. Living here I have had good opportunities to see some of the workings of the United States land office in this place, and I can truly say that in my judgment the present system is excellent if you have good, honest, capable men to do the business.

5. I got my patent in about three months from the time I made final proof. I think this is about the average time. With regard to contested claims, I will say that so far as I know the trials at the local offices are brief, and conducted impartially. The expense depends mostly upon the contestant's lawyer's fees. I have known a man to spend $150 in a contest, and I have heard of some who have spent $300. There was a case not long since here in Gage County in which the contestants each spent $125 besides their time. From the time the contest commenced to the time of final decision from Washington it took about eight months. Where there has been no contest there has been no delay. Of course I need not speak of the time one is required to live upon a claim in order to make final proof. It is better for one who wants to obtain public lands to go to the United States land office himself and do his own business. A homestead of 160 acres costs $18.

6. Concerning defects of our land laws I will speak of one in particular, and that is the act which relates to "timber culture." If I had money which I wanted to invest in public lands I would, or might, proceed thus: I would go to a dozen men and say "Here, I want to hire you to work for me a little during the next five years. And what I want you to do is to go to the United States land office and each take 160 acres of land under the timber-culture law and I will do the breaking and plant the trees. All I want of you is to be on hand when the time for proving up comes. I will pay you well for your trouble and of course you will sell me your land at once." Now, the above is the way it can be and is done.

In addition to the above I will say that the law under or by which the Indian reservation in the southern part of this county is being disposed of is very defective. Why, I might go down there, pick out a claim, come back to the land office and file on it, and return and cut and sell wood to my heart's content for the next three months. I will suggest no remedy.

7. So far as I know the eastern portion of our State is excellent for agricultural and pastoral purposes. How it is in the western part I know but little from actual observation.

8. I think all the information desired under this head might be obtained from our State geologist.

9. With regard to this I will say that I believe the present system of making surveys of public lands is a bad system. To my certain knowledge the work in many instances

is carelessly done, and in some cases much of the work described in the field-notes of surveys has never been done. For my part I think the better way to do would be to let the government employ competent engineers by the month or year.

10. I know of none.

Yours truly,

WILLIS BALL.

Testimony of Minor W. Bruce, Knox County, Nebraska.

The questions to which the following answers are given will be found on sheet facing page 1.

1. Minor W. Bruce, Niobrara, Knox County, Nebraska; correspondent.
2. Nine years in county; twelve years in State.
3. Have acquired 160 acres under pre-emption laws.
4. Am a member of Bruce Colony, the most successful in the State. Have taken great interest in the settlement of the county, and feel pretty well acquainted with the operation of the homestead, timber, and pre-emption laws.
5. From the date of proving up on pre-emption or final proof of homesteads, from six to eighteen months has elapsed before securing patent.
6. The land officers should be obliged to have a reasonable time expire, say, four or six weeks after land that has been relinquished by the person holding it, after it has been returned to the office as canceled, for frequently parties sell their improvements to persons who are not able to secure it before it is taken by some one else. Under a late law, it becomes necessary to give notice through a newspaper of the intention to make proof, and it becomes necessary for such person to go to the place in which the land office is located in person, thus making a considerable expense to the homesteader. This expense, or a portion of it, thould be paid by the government.
7. The conformation and physical character of Knox County, Nebraska, is quite rolling and hilly along the Missouri River, but as you go back into the interior it becomes gradually less bluffy, until it settles down to a gently undulating plain, and is principally agricultural.
8. I think the government can fix the general character of the several classes of land by geographical divisions other than by a general rule.
9. No views on this matter.
10. I think the present method of disposing of the public lands cannot be improved, only in a few reforms of the system as suggested above.

AGRICULTURE.

1. In Northern Nebraska the fall of rain is usually abundant in spring, but in summer is liable to drought.
3. All of it can be cultivated without irrigation.
4. An increase of crops can be had by irrigation in the summer.
5. Irrigation never attempted in our part of State.
6. No idea.
7. The Missouri River, Niobrara River, Verdigris, and Bazill.
12. Perhaps one-hundredth part.
13. It is, in my judgment, practicable to establish homesteads on the pasturage lands.
14. In my judgment it is unwise to put any lands in the market for private entry, for it retards the settlement of the country, and, if sold in large tracts, the speculators will ascertain, as they already have in Nebraska, that it is a poor investment, for the actual settlers are taxing the lands to the greatest possible extent for bridge, road, and school purposes.
16. Eight or ten head of cows will support an average family.
17. Perhaps seventy-five.
18. The growth of grass has increased.
19. Cattle raisers in our section do not fence their ranges, and they will flourish in winter on the range.
20. No.
21. Running water, and Missouri River and Elkhorn.
22. Don't know.
23. Don't know.
24. Yes.
25. There are none in our section.
26. Four hundred head of sheep in our county; 3,500 head of cattle.
27. None.
28. No trouble whatever.

TIMBER.

1. Timber land in our county is confined to the streams entirely.
2. Small, scrubby oak, cottonwood, elm, ash, cedar, box-elder, and ironwood. Oak is regarded as best, and is most all native and of very slow growth.
3. Should dispose of timber in quantities of 40-acre lots to actual settlers, say for from $4 to $15 per acre.
4. Would not classify the different kinds of forest lands.
5. When forests are felled in our section a second growth springs up, the cottonwood and box-elder growing to a height of 12 feet and 15 feet in six years.
6. Fires are usually set out by mischievous persons and Indians, are very destructive, usually accompanied by high winds. Our State imposes a heavy penalty for setting fire to the prairie. The Land Office could by a reasonable law provide for the secure protection of the settlements and timber, and a rule established by the Interior Department would be more respectfully regarded than a law of the State.
7. There should be a law for the protection of the timber from raids by persons who cut it for speculative purposes, though I am of the opinion the actual settlers should have access to all the timber belonging to the government for actual use.
8. It has been the custom in this county for actual settlers to cut what timber is necessary for home supply.
9. The timber laws would be more efficiently executed if their administration and general custody were placed in the jurisdiction of the United States land offices.

LODE CLAIMS.

No knowledge.

PLACER CLAIMS.

No knowledge.

Testimony of Uriah Bruner, attorney-at-law, West Point, Nebr.

The questions to which the following answers are given will be found on sheet facing page 1.

Answers to questions submitted by the Public Land Commission.

1. Uriah Bruner, attorney-at-law.
2. Twenty-three years.
3. Yes, 160 acres unoffered land under pre-emption act September 4, 1841.
4. Have been receiver for about six years. Land office West Point, Nebr., and Norfolk.
5. On uncontested entries. Homesteads, including witnesses and their expenses, about $40 average. Some few made their entries say for $25, while others living at a great distance from office their expenses have run up to $75. Timber claims, including proof, exclusive of the improvements that have to be made on the land, would be about the same as in homesteads. Fees in pre-emption entries are considerably less. Since I am out of the office I understand that the applicant to homestead and timber claims are required to give thirty days' notice by publication of his intention to make final proof. This is a useless and burdensome expense, which should be done away with. No one but the proprietor of the newspaper will be benefited by such notice. Contested claims are frequently very expensive to the contesting parties. The average expense of a contest is perhaps $40. Where no attorneys are employed and personal notice given the expense is sometimes reduced to about $15, but more frequently it will cost $100.
6. The timber law as it stands has several defects, in my opinion. It requires that 2,700 trees should be planted to each acre, and 675 shall be growing and be thrifty at the time of proving up (five and six years after same are set out). There should no more trees be required to be planted than there are required to be living and in thrifty condition at end of eight years. No trees that are fit for first planting will do well to be planted so close together. They will choke out one another, and while the thriftiest and most vigorous will survive, it will yet be injured by those that have been killed out by the choking process. Trees in forest grow straight with long bodies, but they are much retarded in their growth by being overcrowded. It is far better to plant the proper distance so they will not interfere with the growth of each other by overcrowding until they attain a sufficient size for purposes of poles and fire-wood, when the thinning out process can be done by the farmer with profit to the forest as well as to himself. I have considerable experience in raising forest trees in planted groves, and my views I give here are from actual observation and practical experience. I believe that the claimant under the timber law should be required to plant 40 acres for every 160, and the number of trees

required to be planted to the acre should be about 640, and the number at time of proving up to be about 500; that all homesteaders and pre-emptors on prairie lands should be required to plant and have in growing and thrifty condition 10 acres for every 160—five years after the entry of the same and before the proving of said entries for patenting. In homesteads the proof to be made at the time of final proof and in pre-emptions the proof to be made five years after the date of settlement. There are now acres of land in Western Nebraska and Kansas that are worthless for all purposes except for grazing. These, under proper restrictions, could be sold on condition that part of the same be planted in forest trees. Here care should be taken that the same be not sold in too large bodies to one person or company of persons. Rather have the government inaugurate a system of leasing (as they used to have in Australia) at public auction for a term not to exceed five years at a time. Great care will have to be used or large cattle raisers will soon have a monopoly of all desirable grazing lands. In this land district (Norfolk) the lands are what is called *prairie*, with very little timber here and there on the edges of the water-courses and running streams. Most of the lands are good, rich, farming, agricultural lands. There are yet large bodies of bad, sandy lands, nearly worthless at present except for grazing purposes.

9. I consider the present system well adapted to this part of the public domain.

10. Answered under 6.

AGRICULTURE.

1. We have sufficient rainfall in this part of Nebraska; snowfall variable. So are the winters—about two-thirds of which are very fine, and one-third extremely cold and boisterous.

2. No irrigation needed or in use here. Most rain between 10th May to 1st July; different seasons variable.

3. All except the sand streaks, which should be planted in timber to get vegetable mold mixed in with the sand.

4. None.

5. None.

8. Crops are raised everywhere in Eastern Nebraska; have no experience in irrigation.

12. The sandy lands above referred to.

13. I think that homestead, timber law, and pre-emption law should be left in force even in pasturage lands until it is definitely determined that no homes will be made or farms opened any more. Cattle monopolists will undoubtedly clamor for an abrogation of the land laws on the plains; but we should proceed very cautiously in this direction. We should remember that this is the day for aggression by large monopolists of all kinds. Our government was established not with a view for enriching a few at the expense of the many, but rather for the purpose of affording opportunities to the toiling millions to rise with the dignity of labor to a comfortable competence for himself and his family. It is the government's duty to see to it that all shall be brought up well, be educated in the rudiments of a good common-school education, and that this bringing up may be done by the *pater familias* without materially cramping himself, the question of social science is undoubtedly the most important that can engage the attention of statesmen, and the land question entering so largely into this question is perhaps the most difficult to solve; to move with great caution must be our motto.

18. Wild grasses decrease by pasturage; prairie fires also injure grass lands.

19. No. Except where the settlements are dense and the land is all occupied. No.

20. No.

21. Wells and creeks; running water principally.

TIMBER.

1. But little, only fringing on running streams.

2. Mostly cottonwood, some box-elder, soft maple, ash, black walnut, and white willow. Cotton is preferred for its early maturity, white willow next, box-elder, soft maple, and ash. Time of growth, from May to September.

Very respectfully, &c.,

URIAH BRUNER.

Testimony of Royal Buck, Red Willow, Red Willow County, Nebraska.

Answers to questions submitted by the Public Land Commission.

RED WILLOW, NEBR., *December* 8, 1879.

1. My name is Royal Buck; residence, Red Willow, Red Willow County, Nebraska, and my occupation is a farmer.

2. I have lived here nearly eight years.

3. I have a homestead under act 1862, and a timber claim under act to promote growth of timber, &c.

4. I have served as register of United States land office at Nebraska City from 1861 to 1865, and during the past two years have spent much time in looking out claims and locating immigrants.

5. The expense of procuring title under homestead has been about $30 uncontested, and from $50 to $75 where contested.

6. Yes; first homestead law. The present law permits parties to make entry at the local land office without swearing that he is an actual resident of the tract or that he has made any *bona-fide* improvement on the same, but when the homesteader goes before the county clerk of the county where the land is situated he must swear that "he is a resident (or that some member of his family is residing) on the land he applies to enter, and has made *bona-fide* improvement on the same." This seems to be an unjust discrimination; it is also absurd. Suppose a man comes to Western Nebraska from Illinois to look up a homestead. His family is left at their old home; he comes by rail, stage, &c., finds his land, establishes its boundaries, and then, without any conveniences at hand, he must establish a *residence*. The truth is, he can't do it, but in order to secure it he throws up a few sods, calls it a residence, and makes the affidavit required under a mental protest and reservation—practically swearing falsely. My suggestion is this, that every man who enters a homestead be required to swear that he has performed some personal act on the land by which he proposes to initiate title, and that he has also made commencement of residence on the same. Another suggestion is that where great distance or bodily infirmity prevent personal attendance at district land offices applications may be made in the county where the land is situated, before any officer authorized to administer oaths, having a seal, same as timber-claim entries. Now homestead applications and affidavits can only be made in the counties before the county clerk. County judges and notaries are ruled out, and clerks monopolize the business, much to the inconvenience of settlers. 2d. As to timber-culture entries, I have thought if they were confined to actual residents of the counties where the lands are located it were better. Too many trees are required to be planted. The first law placed the trees too far apart; the present law is on the other extreme—give us the half way.

7. Bottom lands along streams with some timber; soil rich sand loam, beautiful "divides" or uplands well adapted to both agricultural and pastoral.

8, 9, and 10. Have no suggestions. Present laws seem well adapted to promote actual settlement.

AGRICULTURE.

1. Climate is good; rainfall is increasing; usually have from 5 to 12 inches of snow in winter, but it disappears soon after falling.

2. Heaviest rains usually occur in April and July; most seasons then are sufficient for all practical purposes of farming. When drouths occur they are usually in June and August.

3, 4, 5, 6, 7, 8, 9, 10, and 11. Have no experience in irrigation. We have some streams which might be utilized for irrigation.

12. Not more than one-twentieth part.

13. Homesteads of a thousand acres might be selected in some localities which would be suited for stock ranges only, but these should be confined to cañons and bluff lands when ordinary farms cannot be made.

14. Most decidedly no.

15. About 5 acres. This is called a first-class stock country.

16. About 50 head.

17. Can't state.

18. Buffalo grass decreasing. Blue stem and other large grasses increasing.

19. No fences; cattle can't well be confined in winter on ranges by fences.

20. No.

21. Red Willow Creek, Republican River, and several smaller streams.

22. Ten sheep.

23. Decrease.

24. Not well.

25. Know of no conflicts.

26. Sheep from 100 to 500 head, and about same of cattle.

27. No suggestions.

28. Yes, very much. The surveys in the eastern half of the county have been done badly, *very* badly. Many townships have no evidence that any government survey has ever been made. The truth is, great fraud has been perpetrated in the government surveys, and as a result those who settle on these lands are obliged to have them surveyed. A resurvey ought to be made by the government, and the contractors who made the first survey ought to be prosecuted on their bonds and oaths on returns.

TIMBER.

1. Only small belts of timber along the streams. The varieties are cottonwood, box-elder, ash, elm, and hackberry.
2. The kinds of timber usually planted are cottonwood, box-elder, and ash, and cottonwood is considered the surest growth and quickest to mature. Ten years of growth give fine groves.
3. Timber lands in this county are all under claim by homesteaders and pre-emptors. Have no suggestions to submit. Have no suggestions on remaining questions under this head.

The other topics in circular not relevant to this locality, and no suggestions are submitted.

In closing these suggestions I desire to recur again to the subject of the public surveys. Some relief ought to be afforded the settlers in many portions of the western part of the State. It is an immense burden upon new settlers to be obliged to hire a surveyor to run out their claims before they dare build a house, and when so surveyed there is no certainty of correctness. There ought to be a resurvey of all the land west of range 25 west of sixth principal meridian and south of the Platte River.

Respectfully submitted,

ROYAL BUCK.

Testimony of Lewis H. Kent, lawyer and land agent, Orleans, Nebr.

The questions to which the following answers are given, will be found on sheet facing page 1.

1. Lewis H. Kent, Orleans, Nebr.; lawyer and land agent.
2. One and a half years in county and four years in State.
3. I have not.
4. By being in the land business.
5. About $50 for uncontested and $75 for contested.
6. Would allow the local register to put on entries, upon a relinquishment being made at the local land office.
7. Agricultural and pastoral.
8. Geographical division.

AGRICULTURE.

1. Climate good; long summer.
2. In the spring. Yes.
3. Nearly all of it.
5. None.
10. Water has been all taken up under homestead and declaratory statement laws, only under contests of the land.
12. About one-third.
13. Yes.
14. Yes, and the quantity should be limited.
15. About two acres per head.
16. About ten.
18. The growth of buffalo grass has diminished and blue-joint grass increased.
19. They do not fence. Yes, I think they can.
20. Yes.
21. Plenty.
22. About seven.
23. Diminished.
24. No.
25. The sheep raisers drive the cattle owners out.
26. About 5,000 head of cattle and 2,000 sheep.
28. Yes, great trouble.

TIMBER.

1. About one-twentieth of the land. Cottonwood timber mostly.
2. Cottonwood and maple.
3. Would sell it in small tracts of about 10 acres.
4. No; only as above.
5. Yes. There is a second growth.
6. Very great.
7. Considerable timber is cut for fuel by homesteaders
9. Yes, much more so.

Testimony of R. A. Kenyon, farmer, Hooker, Gage County, Nebraska.

The questions to which the following answers are given will be found on sheet facing page 1.

1. R. A. Kenyon; farmer; Hooker, Gage County, Nebraska.
2. Ten years in county and twelve in State.
3. I have, under pre-emption and homestead laws.
4. In seeing lands sold to speculators.
5. In my case I complied with the law and got my title within six months after proving up; others have not gotten theirs under two years.
6. The selling lands in larger tracts than 160 acres has worked detrimental to this part of the country.
7. This county is pastoral, with plenty of good water for stock.
9. The present system of survey is the best that could be had for this section of the country.
10. The only and best way, in my view, is the present method, in giving the lands to actual settlers in whole.

AGRICULTURE.

1. The climate has changed since I have been here; we have one-half more rain yearly than we did six years ago, but this has been a dry season; snowfall is light.
2. June and July in heavy quantities. Yes.
3. All.
4. None.
5. None.
13. Yes; one section.
14. Yes, it should. If it is not moneyed men will get it all, and make the rich richer and the poor poorer.
15. One acre. The best I have ever seen from Minnesota to Louisiana and from Nebraska to Vermont.
16. Twenty-five.
17. Not more than four.
18. Increased.
19. None. They can.
20. They would.
21. Springs generally.
22. Ten.
23. If not overpastured it has held its own.
24. Yes.
25. I know of none.
26. About equal. Cattle average 100 head, sheep 400.
27. None.
28. None.

TIMBER.

1. About one-half all young timber and spreading timber is being put out every year. The timber is on the streams.
2. Cottonwood, soft maple, walnut, and ash. I regard all essential. Cottonwood and maple have the quickest growth.
3. In such locations as mine in ten-acre lots by lease, for the reason that it would give the timber to those that most need it.
4. I would.
5. There is a second growth, and generally faster than first.
7. Lease, in small quantities.

Testimony of H. W. Parker, register, and R. B. Harrington, receiver, Beatrice, Nebr.

BEATRICE, NEBR., *November* 3, 1879.

Public Land Commissioner, Washington, D. C.:

SIR: In compliance with your request we give you our "views of the present land laws and the administration thereof."

1. The pre-emption act of 1841 should be repealed. The only use made of it, as far as our observation goes, is to prolong the time of keeping the land from taxation. A party will file on unoffered land and hold it thirty-three months, and then commute

his filing to a homestead entry and hold it for seven years longer before perfecting his title. A homestead claimant can commute his claim to a cash entry after six months' residence, and that is as soon as a pre-emption claimant can get title.

2. The act of March 3, 1879, requiring homestead and pre-emption claimants to advertise thirty days before proving up, should be repealed. In our opinion it is a useless act, doing no one any good except the printer, but causing the claimant useless expense and trouble.

3. The homestead law should be so amended that when a homestead or timber culture claimant relinquishes his entry in writing, the land shall be open to entry without further action by the General Land Office, the local officers making report at the end of each month the cancellations made during the month, and transmitting to General Land Office the written relinquishments.

4. The act of March 3, 1879, "granting additional rights to homestead settlers," should be amended. It discriminates against the soldier. A soldier who has taken less than 160 acres cannot make an entry under this act, while a citizen who has made an entry of 80 acres, paying $9 for the entry, can make an additional entry of 80 acres without paying anything, thus giving him 160 acres for $9, and the soldier who took 160 adjoining him had to pay $18. The citizen should at least pay as much for his 160 acres as the soldier has to pay. If any difference is made it should be in favor of the soldier. All acts for the disposal of the public lands, except this act, allow the register and receiver a commission on the sale or disposal of the land according to price of same. Why should they be required to do the work under this act for nothing? If the government wants to give the land away, all right, but it should provide for paying its agents for doing the work necessary. S. No. 490, providing that the fees allowed registers and receivers for testimony, &c., shall not be considered or taken into account in determining the maximum of compensation of said officers, should become a law, or else H. R. 5493, to authorize the Secretary of the Interior to make allowance for rent of United States land offices, should become a law, and the fees heretofore accounted for by the recorder and receiver for taking testimony, and covered into the Treasury of the United States, should be returned to them, or the rent paid by them refunded. Rent of offices and fuel should be paid by the government, or allow the recorder and receiver the rents for taking testimony, making abstracts, &c.

5. The timber-culture act should remain as it is. In our opinion it cannot be improved by amendment.

6. The grazing lands in the western portion of this State, which are unfit for grain raising, and only fit for grazing, should be offered for sale, and all not sold at time of offering should afterward be subject to private entry.

7. The system of public land surveys should be changed. It seems impossible to get a good job done under the present system.

Respectfully,

H. W. PARKER,
Register.
R. B. HARRINGTON,
Receiver.

Testimony of Moses Stocking, farmer, Wahoo, Saunders County, Nebraska.

The questions to which the following answers are given will be found on sheet facing page 1.

To the Public Land Commission, Washington, D. C.:

SIRS: A press of work, compelling much absence from my home since the receipt of your circular, is the cause of delay in attending to its many points, points requiring extensive and varied knowledge to enable one to approximate a satisfactory answer. But to the "questions."

1. My name is Moses Stocking; residence, Wahoo, county of Saunders, Nebraska; occupation, farming and stock raising.

2. Have lived in this county fourteen years, and in the State twenty-three years, and have had some acquaintance with the country since May, 1853.

3. Yes; secured a pre-emption right in Cass County in 1857, and a homestead in this county in 1872, and under the laws then in force.

4. That of my neighbors who have acquired lands near me.

5. Under the pre-emption laws the time has varied from one month to twelve months in non-contested cases. In contested cases the time is often much greater, occasionally running into the second or third year, and sometimes attended with much expense to the parties. The decision of homestead contests are equally dilatory. A case is now pending in Butler County—that of Albert Long for the west one-half of east one-half section 20, township 15, range 4, sixth principal meridian—which has been pending about eighteen months. Parties have made several trips to Lincoln, fifty miles dis-

tant, with witnesses. No notice of a decision had reached Long on the 10th instant. He still remains upon the land, which is about two-thirds improved; is justly entitled to it; is very poor and unable to litigate. The case is a hard one.

6. The land laws as they now stand, so far as I understand them, are far more perfect in the spirit and letter than is the practice of the officers who are intrusted with their administration. Land attorneys are a nuisance to the honest poor man, and should never be allowed inside a government land office. All that is required is capable and honest land officers.

7. There is no longer any government land in this county; all sold, as is a large portion of the railroad and school lands. The topography varies from level alluvial bottom to high rolling land, a portion being smooth table and another portion smooth rolling land. All is agricultural timber, very limited. The topography of the State, with the exception of some sand-hills, is quite similar to that of this county. The entire State originally comprised one grand pasture-field. Twenty-six years ago probably not more than one-half of the area, and that in the eastern part, was agricultural. To-day about seven-tenths is fairly such, due to increased moisture. The balance is still only pastoral, and of these three-tenths the next quarter century will no doubt have redeemed all, excepting perhaps the higher table lands in the west end of the State.

8. Cannot find the act referred to. The character of Nebraska lands already is pretty well determined, being nearly all sufficiently fertile for agricultural purposes, moisture alone being needed west of North Platte, and even there the bottom lands should now be classed as agricultural. The practical "rain belt" has moved westward about 100 miles during the last twenty years.

AGRICULTURAL.

1. The climate of Nebraska is mild for the latitude, and subject to sudden changes, but salubrious and healthy. Mean annual temperature for a series of eight years, according to two records, 47.57°; average snow and rainfall for same time, three records, 32.95 inches; coldest days, January 7, 1864, and February 15, 1866, 32°; rainfall of winter months, 3.71 inches; of March, October, and November, 4.9 inches; other months, 20.86 inches.

2. Rainfall, as shown in preceding answers, occurs mainly during the crop months and is all-sufficient—the last three seasons too much.

3. Ninety-nine per cent.

12. About 10 per cent. is better adapted to pasturage than to plowing, owing to roughness.

13. Yes; second limit to 640 acres, or even less.

14. No. For then the land would be taken by capitalists in large tracts for stock purposes, and thus keep settlers out. What the country wants is homesteaders and families. The country is desirable and sure to settle in time if held free for families. Allow the stockmen to use it until wanted by actual settlers, but never allow them to gobble the fee of the soil.

15. About three acres, but were the soiling system practiced two acres would do it better, and make four times the manure.

This section compares favorably with others.

16. There should be at least one bovine to each person in a family or nation. Nebraska has about one-twelfth less cattle than people.

17. Fifteen and sixty-seven hundredths to the square mile.

18. Increased—fully doubled in twenty years.

19. No. Only use a corral. It would not be safe to confine cattle in winter unless water, grass, and shelter were abundant within the inclosure.

20. Think so, as thin scrubs and low-grade bulls would be castrated, and encourage the using of good blood as breeders and sires.

21. Springs, creeks, rivers, and wells.

22. About ten of merino and six of cotswold.

23. Increased where not overstocked.

24. Yes; but it is not quite safe for the sheep.

26. Four thousand one hundred and twenty-five sheep, and 11,850 cattle. Sheep are mostly herded in flocks of 500 to 700, and cattle in herds of 50 to 150 head. Cows are frequently lariated near the dwelling-house.

27. I would encourage the completion of both the North Pacific and the South Pacific Railroads by moderate and reasonable land grants, and would limit the prices at which the lands should be sold by the companies. Had previous grants been thus limited all would have been well. Corporations should not be allowed to charge the settler a higher price than the government charges him for lands of similar quality and location. The completion at an early day of those roads has become a necessity to the country. They are needed to facilitate communication between distant parts of our broad land, and to promote the settlement thereof; and to move the crops,

which must soon be grown thereon. And again, they are greatly needed to facilitate the movement of troops, stores, and ordnance for the protection of the frontier settler against Indian raids, and to forever stop Indian wars. The Indian policy of our government is the most stupendous folly on earth—a farce which out-Herods the devil's glee at the sufferings of Christ upon the cross—a fraud of the first magnitude upon both races. Ask that policy where is Meeker? Where is the widow Decker's daughter and her little babe? Where the lady whose scalp with jetty flowing hair attached was found in the Sand Creek camp at the close of Colonel Chivington's fight? Where the victims of the Custer "holocaust?" Where is General Canby; and where, oh where, are the hecatombs of Minnesota's slain?

28. For an arable country like Nebraska, no better system of surveying than the present rectangular one can be devised. But the work should be well done, which was not the case in this county. Excepting upon township and range lines there probably is not one section which has straight sides Corners are from several feet to as many rods out of line. This cause coupled with the fact that the Pawnees pulled up and burned stakes, that the wild animals and the elements combined to tear and obliterate the mounds, renders it difficult often to find corners.

TIMBER.

1. Under the Indian *régime* owing to the devastating annual fires, nearly all timber was confined to the moist margins of streams, to the breaks and cañons of the river bluffs, where fires could not penetrate, and was usually of a short and scrubby character. Civilization has changed all this, and now trees grow most luxuriantly wherever planted and cared for. Originally about 2 per cent. of the area of this county might have been classed as timbered. The varieties were three kinds of oak, two of elm, two of hickory, black walnut, green ash, hackberry, lind, red and box maple, ironwood, boxwood, mulberry, white and yellow cottonwood, black cherry, and many varieties of shrubs.

2. Cottonwood, box and red maple, green ash, black walnut, black and honey locust, sugar maple, white walnut, chestnut, burr and white oak. Of evergreens, arbor vitæ red cedar, pines, firs, spruces, and larch. For ease of planting, rapidity of growth, and durability, the black locust would bear the palm were it not for the borer. Black walnut and green ash promise to be the most useful for mechanical purposes, and are fast growers. Box-maple is esteemed for shade, for wind-breaks, fuel, and sugar.

3. By sale in small parcels or lots to actual settlers. Gauge the size of the lots by the quantity of timber thereon, and grade the price by the quantity and character of the timber, and limit the purchase to one tract or lot. Five acres of good timber is enough for one family. If the timber is poor and sparse enlarge the area under a lease, the timber will be removed and land abandoned. Under private ownership the timber will be closely watched and guarded. Sell to actual settlers only, and on their oath as to settlement, thus barring all speculators.

4. Yes; classify and grade tracts as to price and quality as above stated.

5. Forests are not wholly felled here. The dead trees and those useful in the arts are taken out, affording more room and sunshine for the undergrowth, causing young trees to grow with increased vigor, but the varieties continue about the same. Soon there is an evident improvement in the character of the young trees—they becoming rapidly taller, and losing the shrubby appearance of the older growth.

6. Prairie or forest fires usually have their origin in sheer carelessness or in criminal wantonness on the part of settlers, hunters, and emigrants, the last being curious to see a big fire. In extent these fires often sweep over hundreds of square miles of country and are very destructive in their effects, not only to personal property among the settlements but to all forest growth, and occasionally to life; kill the grasses and damage the soil; increase the bleakness of the climate; destroy the insectiverous birds so useful to the agriculturist, and deprive the earth of its natural and much-needed winter covering, and all without one redeeming benefit. The prevention of such fires is a difficult task. The ordinary fire-guard is of little use in a strong wind. Ordinary roads and creeks are easily jumped. A system of fire-guards of sufficient breadth to insure safety would be a heavy burden upon the people. Owing to the difficulty of proving offenses, punishment by fine seems to have but little effect. Imprisonment no doubt would prove more effective. Let a portion of each fine revert to the informer or prosecuting witness, and it would do much toward detecting offenses. A too stringent law, bordering upon severity, would be non-effective, as the people would not execute it.

7. During the building of the Overland Telegaph Line and the Union Pacific Railroad a wholesale slaughter of public timber along the line of the Platte River was carried on. The best grove in this county, opposite the town of Fremont, was then destroyed, tree trunks being used for ties and the tops left to rot. This county then had no settlers to prevent it. Where timber was cut upon the north side of the Platte usually there was not such waste, for the tree-tops were cut into cord-wood and sold to the company to run their engines. The use of the public timber for mineral, building,

agricultural, and road purposes, or bridging, is indispensable to the carrying on of those branches of business. Therefore the sooner the government puts the timbered lands upon the market in small parcels, and limited, the less of the timber will be plundered. The average citizen would much rather buy at a fair price than to steal.

8. The party who fells a tree I believe usually claims ownership. But his neighbor thinks it a small crime to steal from a thief.

9. As they have the selling of all lands, their facilities for knowing the character of the land in their respective districts, and for obtaining information in regard to depredations are good, therefore they should be efficient detectives and ready prosecutors. But efficiency in this class of duties will require a very different class of men from those who sometimes get into land offices.

The foregoing has been very hastily written, and, being compelled to leave in the morning upon a business trip of several days, have no time to extend remarks or revise the matter thereof.

Respectfully submitted.

Testimony of E. F. Test, claim agent Union Pacific Railroad, Omaha, Nebr.

FREIGHT AUDITOR'S OFFICE,
Omaha, Nebr., November 25, 1879.

1. E. F. Test, Omaha, Nebr., claim agent Union Pacific Railroad.

2. Since 1868.

6. Yes. They should be distributed in larger quantities, and proof of settlement made the basis of ownership. A case in point is the Pawnee reservation, now Nance County, in this State, and the Society of the Boston Aid to Land Ownership. The wealth of the society represented $15,000,000. The society wanted to buy it in the interest of the workingmen, making proof of settlement the basis of ownership, starting towns, farms, and advancing the means to cultivate and improve the land. The present laws prevented, and the reservation is still largely unsettled. One of the land grant railroads has been pursuing this policy through other parties in Boone and Greeley Counties, and the said counties, one of them at least (Boone) has more than doubled its population in two years.

27. Encourage our churches and charitable institutions to quit pauperizing our poor people in the large cities and elsewhere by doling out food and clothing to able-bodied men and women, and urge them to move out on the public lands. Sufficiently large tracts might be set aside for such purposes and the churches and charitable institutions have their superintendents in charge to locate the poor people on the homes of their own, advancing the means necessary to start them, payable at stated times, and forfeiture to be the penalty for abandonment of their claims. In other words, let the government furnish the land, proof of settlement being the right to ownership, and the churches and the institutions of charity the money to settle and improve them, and give the poor people of our large cities, and elsewhere, the chance to build up homes for themselves and their children. It cannot be disputed that every new institution of charity brings in an increased list of paupers. Pauperism to crime is a natural step, and then government is compelled to support many of these people in our prisons. It is cheaper to make them good citizens and producers. The churches have had much to do with this pauperization in the past through mistaken efforts at charity. Colonel Robert Ingersoll says: "It has reduced Italy to a hand-organ." Will it do so for the United States? This idea I do not consider impracticable. It has been agitated by myself and others in this State for a number of years. The Roman Catholic Church has already adopted it and is meeting with success. The Methodist Episcopal Church might also adopt it to advantage, as they raised $5,500,000 for educational and missionary purposes in the centennary of its existence. Was it better than giving homes to our poor people?

I respectfully offer these suggestions to the honorable Commission for what they are worth.

E. F. TEST.

Testimony of C. H. Walker, real-estate agent, Bloomington, Nebr.

Referring to the circular inclosed to me from the Department of the Interior, I have to say:

1. My name is C. H. Walker. My residence is Bloomington, Nebr. I am now engaged in real estate. I was register of this land office from 1872 to 1875.

2. I have lived in this State since 1862.

3. I have acquired a quarter section of land under the homestead, also 12 quarters with agricultural scrip.

4. As register of the United States land office I had a pretty good opportunity to learn the practical workings of the public-land laws.

5. An intelligent answer to your fifth question involves so many contingencies it is very difficult to answer it intelligently. Sometimes returns come back from the department in reasonable time, but in other instances they drag. In contested cases much depends upon the attorneys or the complications that surround the case.

6. In the timber-culture act, the State horticultural society of this State asked Congress, by resolution at their meeting of 1878, to set apart one-fourth of every section for the cultivation of timber of those lands that are naturally devoid of timber. This recommendation was made by a class of men that give these matters much thought, and who have watched the operations of the law. This country needs more timber, and if one quarter of each section was withdrawn for all other purposes, in the end there would be a forest on every section. Again, I believe it would be to the advantage of every man taking a homestead if he was required to plant and cultivate a certain amount of timber, if the homestead was devoid of timber. The country wants more timber to assist in modifying the climate of the prairies, and there has been much talk and many plans proposed whereby its growth would be encourged. I believe, and I also express the conviction of many that I have talked with, that the government should require more in this direction.

7. In answer to question 7, an experience on the frontier for sixteen years has taught me that the country is undergoing a radical change in climate, and that what a few years ago—I mean seven or eight years ago—were classed as pastoral lands are now regarded as the best agricultural lands. By referring to the maps of the Union Pacific Railroad of 1870 to 1872, it will be observed that the entire Republican Valley in Nebraska was classed by them as pastoral lands, and yet within the last four years this county (Franklin) has taken the champion prize at the State fair of Nebraska offered for the largest and finest display of farm products in the State. My own opinion is that if let alone this question will settle itself, and that by experience is the only way it can be settled. I believe in a very short time it will all be agricultural lands, and that it should be held as such; that it would be a great calamity to the country if there was any change in the manner of disposing of the public lands, so as to build up a landed cattle aristocracy. Let the matter settle itself.

In answer, severally, to your questions 8, 9, and 10, I do not see how the public can be much better protected nor how the homeless can receive greater encouragement than under the present law. I can see how it would be to the advantage of men of great capital to be allowed to purchase large tracts to be held for their own purposes of grazing. They have the use of it now, and when disposed of it should be for the good of a greater number. As before stated, the present system of disposing of the public lands is good enough, and I do not see how it can be bettered by a radical change. I speak only for Nebraska.

C. H. WALKER.

Testimony of W. H. Beatty, chief-justice of Nevada, Carson City, Nev.

CARSON, NEV., *November* 21, 1879.

GENTLEMEN: Having received a copy of your circular requesting information in regard to the subjects to be reported upon by you, I would state that I have had no experience and but limited means of observing the practical workings of any portion of the public-land laws except those which relate to the location of mining claims, and more especially lode claims. I would therefore confine myself to the questions under that subhead:

First. In regard to my experience of mining and mining litigation, I have been a resident of Nevada for nearly seventeen and of the Pacific coast twenty-seven years, during most of which time I have been more or less conversant with the operation of miners' rules and customs. From 1864 to 1875 I was judge of the districts embracing Lander and White Pine Counties. Each of those counties contained numerous mining districts, with varying rules and customs, and in each a great number of mining cases were litigated during my term of office. I also presided, by special appointment or invitation, at the trial of several of the most important mining cases in Eureka and Pioche, and have thus had occasion to decide over and over again most of the questions connected with the location of lode claims. I have also heard the testimony of great numbers of practical miners of every grade of intelligence, and of many of the most noted professional experts and scientific theorists, as to the formation and characteristics of veins and other mineral deposits where the matter at issue was a question of identity or continuity of veins or lodes. In hearing applica-

tions for injunctions and in trying causes which were submitted for decision by the court without the intervention of a jury, I have frequently been called upon to make minute examinations, in company with experts, of the surface and underground developments upon every variety of mineral deposits and in all sorts of rock formations that are found in Eastern Nevada. Since January, 1875, as a member of the supreme court of Nevada, I have had occasion to review several cases involving a construction of the act of Congress of May 10, 1872, and to consider particularly the effect of that provision of the law (Revised Statutes, section 2324) which accords to the miners of the respective districts permission to make local regulations governing the location, &c., of claims.

Second. In regard to the defects of the law. The principal, the vital defect in the existing law is this permission to make local rules. There are, I have reason to believe, other important defects in the law, but as to most of these there are more competent judges, and I leave it to them to point out the evil and suggest a remedy. But as to the practical workings of the local rules and customs of miners, when allowed the force of law, I have very decided opinions, which I feel that my means of knowledge justify me in stating with some confidence in their correctness. I believe that the whole subject of mining locations is an extremely simple one, which may easily, and certainly therefore ought to, be regulated by one general law, the terms and existence of which shall be established by public and authentic records, and not left to be proved in every case by the oral testimony of witnesses, or by writings contained in loose papers or memorandum-books, such as are often dignified by the name of "mining records." I am convinced, moreover, that the tainting of every mining title in the land at its very inception with the uncertainty which results from the actual or possible existence of rules affecting its validity, perfectly authentic evidence of which is nowhere to be found, is a stupendous evil. Experience has demonstrated that such an uncertain state of the law is a prolific source of litigation, and no experience is required to convince any man of ordinary intelligence that it must have the effect of depreciating the value of all unpatented claims by deterring the more prudent class of capitalists from investing in them. That the subject is simple enough to be embraced in one general law is proved by the fact that the laws of the various districts, although differing in details, are in substance identical, and are substantially contained in the existing acts of Congress.

When placer-mining began in California there was no law regulating the size of claims or the manner of holding and working them, and local regulations by the miners themselves became a necessity. They were adopted, not because the subject was too complicated or difficult for general regulation, but because they were needed at once as the sole refuge from anarchy. The first and most important matter to be regulated was the size of claims, and the earliest miners' rules contained little else than a limitation of the maximum amount of mining ground that one miner might hold. That being determined, he was left to take possession of his claim and work it as he pleased. It thus appears that the location of a mining claim was nothing more nor less than the taking into actual possession a limited quantity of mining ground, and this was accomplished by simply marking its boundaries and going to work inside of them. But in taking possession of their claims miners sometimes failed to mark their boundaries as distinct or to do as much work on them as later comers, desirous of securing claims for themselves, thought essential to an actual possession. Hence arose disputes and violent conflicts. The next and the final step in the development of miners' law accordingly was the regulation of the mode of marking the boundaries or otherwise designating the locality and extent of claims and the *quantum* of work that must be done to hold them. As a fence around the claim was utterly useless, four stakes at the corners or two stakes at the ends of the river boundary of a placer claim were usually allowed to be a sufficient marking of its extent; but, in this connection, a written notice, descriptive of the claim and containing the name of the owner, was sometimes required to be posted on the ground and recorded by the district recorder. Then, as it was frequently impossible to continue work upon a claim on account of scarcity or superabundance of water, and as miners were frequently driven from the vicinity of their claims by the severity of the winter season, the rules went on to prescribe the minimum number of days' work per annum by which a claim could be kept good, or the maximum of time during which the miner might absent himself from his claim without being deemed to have forfeited or abandoned it. In rare and exceptional instances miners may have attempted to extend their regulations to other matters than those mentioned, but I risk nothing in saying that the above statement embraces the essence of all the miners' law of the Pacific coast relating to placer claims. After these regulations had been some time in force came the discovery of veins or lodes of gold-bearing rock in place, and to them the law of the placers was adapted with the least possible change.

First. The size of claims was regulated by allowing so many feet along the vein.

Second. The mode of making out or designating the claim was prescribed; and

Third. The amount of work necessary to hold it.

The principal modification of the placer-mining law as adapted to lode claims was

upon the second point. The placers were located as surface claims and were best marked by stakes at the corners; notice and record, when required, being deemed of minor importance. In lode claims these conditions were reversed. The exact course or strike of a lode was seldom ascertainable from the croppings at the point of discovery; and as the claim was of so much of the lode in whatever direction it might be found to run, with a strip of the adjacent surface, taken for convenience in working the lode and as a mere incident or appurtenant thereto, it was found to be impracticable to mark the claim by stakes on the surface, and hence the notice and record came to play a more important part in designating the claim. They came in fact to be all-important, locations of lode claims being commonly made by posting a notice in reasonable proximity to the point at which the lode was discovered or exposed, stating that the undersigned claimed so many feet of the vein extending so far and in such direction or directions from the discovery point, together with the amount of adjacent surface ground allowed by the rules of the district. This notice so posted had the effect under the rules of holding the ground described a certain length of time, commonly ten days, within which time it was necessary to have the notice recorded in the district records in order to keep the claim good. This was all that was required under the head of marking or designating the locality and extent of the claim, and it was thereafter held by simply doing the prescribed amount of work.

This was the sum total of the California miners' law, and it has never been materially altered or added to in Nevada, nor, so far as I am advised, in any of the other mining communities of the country. By reference to sections 2319 to 2324, inclusive, of the Revised Statutes it will be seen that it is all embraced in the act of May 10, 1872, which is distinct and specific in its provisions as to the size of claims, the marking of claims, and the working of claims. What room, then, is left for any local regulations upon the only points that the miners have ever assumed to regulate? Just this: The miners *may*—

First. Restrict themselves to smaller claims than the act of Congress allows.

Second. Require claims to be more thoroughly marked than would be absolutely necessary to satisfy the terms of the act.

Third. Require more work than the law requires.

Fourth. Provide for the election of a recorder and the recording of claims.

As to the first three points it may be safely assumed that no such regulations will be adopted in any district hereafter organized. Mining districts are organized by those who discover valuable ore bodies outside of the limits of existing districts, and these first comers will be sure to take all the law allows them to take, and will do nothing on their part to increase the difficulty of holding what they have got. Later comers, not being able to deprive their predecessors of rights already vested, will find their advantage in claiming any new discoveries on terms as liberal as others have enjoyed, and it will inevitably happen that the privileges of the law will be in no wise abridged. Permission to abridge them is therefore wholly superfluous.

In some of the older organized districts the local rules do restrict the size of claims; but in no case within my knowledge do they exact as much as the statute in regard to marking and working claims. Under the regulations restricting the size of claims in these old districts rights have vested which ought to be protected; but in amending the law, with a view to its prospective operation in old as well as new districts, nothing is to be gained by permitting miners any longer to regulate either the size of claims or the mode of marking them or the amount of work to be done on them. The only effect of such permission is to make the terms of the law upon these important points everlastingly uncertain, without the least prospect of its ever being improved.

The fourth point at present left open to regulation by the miners remains to be noticed. All the district rules with which I am acquainted provide for mining recorders and the recording of claims; but under existing legislation such rules are worse than useless. The statute, it will be observed, does not make any notice or record obligatory or define their effect. If the miners themselves made no regulation on the subject, claims would be located by simple compliance with the terms of the statute, which contains in itself ample provision for everything essential to a location; *i. e.*, size of claim and marking and working. Under the statute the vein is located by means of a surface claim, which not only can be but must be marked on the ground. When this is done all that the notice and record were ever intended or expected to accomplish is effected in a manner far more satisfactory and complete. In place of a very imperfect and often misleading description of the claim, there is a plain and unambiguous notice to the world of its exact position and extent. No reason exists, therefore, for retaining in the law a provision under which it may be made obligatory, by local regulations, to post and record a notice in addition to the marking of the ground. The monuments on the ground do well and completely what the notice and record do only imperfectly and in part.

It may be asked why, if this is so, do the miners, who ought to understand their own business, persist in requiring a notice and record. The answer is, that marking locations by such means has with a majority of miners become an inveterate habit; and

the custom, like many other customs, outlives the causes which called it into existence. For twenty years—from 1852 to 1872—lode claims were located without reference to surface lines, and, as above explained, their locality and extent could only be indicated by means of a notice. Notice and record were therefore an essential part of the system. Now, however, since the law has applied the system of surface locations to lode claims, they have ceased to be of any importance as independent and substantial requirements. But the miners have generally failed to perceive that there has been any radical change in the sytem of making locations. They cannot divest themselves of the notion that the surface is still a mere incident to the vein, and that they must hold by means of their notice fifteen hundred feet of the vein, wherever it is found to run, notwithstanding their surface lines, as marked on the ground, may not include so much.

This ignorance of the change effected by the act of Congress, and the force of habit, are sufficient to account for the retention by the miners of the old regulations providing for the recording of claims; but there is an additional reason which has much to do with it. When a new mineral discovery is made a district is at once organized by the half dozen or so miners who happen to be first on the ground. They generally take a sanguine view of the value of their discovery; they anticipate an excitement and a rush of new locators; if rules are made providing for the record of claims and a liberal compensation to the recorder, there will be a good office for one of their number; and it seldom happens that there is not some man among them who has influence enough to secure the office and the adoption of rules which make it worth having.

It thus appears, if the foregoing statements are correct, that upon three out of four points subject to local regulation by the miners they make no use of their privilege, and that the regulations which they do make on the fourth point, having no reason to support them, are simply useless and vexatious. If this conclusion is well founded my first proposition is established: that the whole subject of lode locations is so simple that it not only may be, but actually is, fully regulated by act of Congress. That the right of local regulation ought to be taken away, if it is of no practical value, is a plainer proposition than the first. The interest of the public would be subserved by cutting off a source of endless litigation, and the mining communities would be especially benefited by the enhanced value of mining property.

The magnitude of the evil resulting from the uncertainty of mining titles will, perhaps, be appreciated when I say that after a residence of seventeen years in the State of Nevada, with the best opportunities for observing, I cannot at this moment recall a single instance in which the owners of really valuable mining ground have escaped expensive litigation, except by paying a heavy blackmail. The statute, it is true, has swept out of existence the most prolific source of vexation and expense in making the owner of a valid location secure within his surface lines. Before the statute the only means of showing that a trespasser was within the limits of your claim was by establishing the identity or continuity of the vein between the point of location and the point where the trespasser was at work. The owner had not only to bring witnesses to prove the law of his title and the facts of his title to a claim, but was compelled to incur ruinous expense in making surface and underground tracings upon the vein and in employing practical and theoretical experts to prove that his claim actually included the part of the vein from which the ore was being taken away. The act of 1872 has, as above stated, done away with this evil to a great extent by making the owner of a claim secure of everything within his surface lines, except such orebodies as can be followed on their dip from a valid location made outside of his lines; and as to a claim of this sort the burden of proof is transferred to the shoulders of the person who, in following the downward course of his ledge, enters the land of another.

But another evil remains. In the nature of things there must always exist the necessity in the assertion of any mining title of proving compliance with the law prescribing the conditions upon which it may be acquired; but there is no necessity for leaving the terms and existance of the law itself to be the subject of proof by evidence, the best of which is always open to dispute.

As long as there are local regulations anywhere, and as long as there may be local regulations everywhere affecting the validity of mining titles, no man can ever know the law of his title until the end of a trial in which it is involved.

In districts where the rules are in writing, where they have been some time in force and generally recognized and respected, the law may be tolerably well settled. But there is often a question whether the rules have been regularly adopted or generally recognized by the miners of a district. There may be two rival codes, each claiming authority and each supported by numerous adherents; evidence may be offered of the repeal or alteration of rules, and this may be rebutted by evidence that the meeting which undertook to effect the repeal was irregularly convened or was secretly conducted in some out-of-the-way corner, or was controlled by unqualified persons; customs of universal acceptance may be proved which are at variance with the written rules; the boundaries of districts may conflict, and within the lines of conflict it may be impossi-

ble to determine which of two codes of rules is in force; there may be an attempt to create a new district within the limits of an old one; a district may be deserted for a time and its records lost or destroyed; and then a new set of locators may reorganize it and relocate the claims. This does not exhaust the list of instances within my own knowledge in which it has been a question of fact for a jury to determine what the law was in a particular district. Other instances might be cited, but I think enough has been said to prove that local regulations being of no use ought to be abolished.

Third. I am not sufficiently informed as to the effects of the practice referred to in this question to give a reliable answer.

Fourth. A vein or lode is contained in a fissure of the country rock. The strike or course of a vein is determined by a horrizontal line drawn between its extremities at that depth at which it attains its greatest longitudinal extent. The dip of a vein (its course downward, Rev. Stat., § 2322) is at right angles to its strike, or in other words if a vein is cut by a vertical plane at right angles to its course, the line of section will be the line of its dip. The top or apex of any part of a vein is found by following the line of its dip up to the highest point at which vein matter exists in the fissure. According to this definition the top or apex of a vein is the highest part of the vein along its entire course. If the vein is supposed to be divided into sections by vertical planes at right angles to its strike, the top or apex of each section is the highest part of the vein between the planes that bound that section, but if the dividing planes are not vertical, or not at right angles to a vein which departs at all from a perpendicular in its downward course, then the highest part of the vein between such planes will not be the top or apex of the section which they include. The strike or course of a vein can never be exactly determined until it has been explored to its greatest extent, but a comparatively slight development near the surface will generally show its course with sufficient accuracy for the purposes of a location. The dip having an exact mathematical relation to the course of a vein is of course undetermined until the strike is determined, but practically the line of dip is closely approximated by taking the steepest (the nearest a vertical) line by which a vein can be followed downward.

The top or apex of a vein is usually the first thing discovered. Sometimes a blind lode, so called, is encountered in driving a tunnel or sinking a vertical shaft, and then of course the top or apex cannot often be found except by tracing it towards the surface by means of an incline.

Of course there are irregular mineral deposits, departing widely in their characteristics from the typical or ideal vein which seems to have been in the mind of the framer of the act of 1872. To such deposits the foregoing definitions will not apply, and in my opinion great difficulty will be experienced in any attempt to apply the existing law to them. I believe however that instances of such formations are comparatively rare, none having fallen under my own observation.

Fifth. The intended rights of the discoverer of a vein are not properly secured by the existing law. I have in two cases (Golden Fleece Company *vs.* Cable Consolidated Company, 12 Nev. 329, and Gleeson *vs.* Martin White Company 13 *id.* 460) intimated my own opinion that the discoverer of a lode is not compelled under the act of 1872 to mark out his surface claim immediately in order to protect his discovery. I have said that he ought to have a reasonable time for tracing the course of the lode and that if he worked diligently for that purpose, and did not unreasonably delay the marking of his location, he would be protected in his claim to 1,500 feet of the lode against one attempting to locate on his discovery while he was so engaged in making the development essential to a proximably correct adjustment of his surface lines. In the same connection I expressed the opinion that a local regulation defining the reasonable time during which a claim of 1,500 feet of the lode might be held by notice and record and work done in tracing the course of the vein would not be in conflict with the law, but in furtherance of its objects, and would be favorably received by the courts. All this, however, is a matter of very doubtful construction, and it ought to be made certain by the terms of the statute. No such local regulation as that suggested has ever been made to my knowledge, and even if there had been, and it was perfectly certain that it was consistent with the statute, it is still extremely desirable, on the grounds stated in my second answer, that whatever regulation is made should be made by law and not by local and varying rules.

Sixth. Litigation has arisen and injustice will certainly result unless the law is construed to mean or is so amended as to provide that the discoverer of a lode has a reasonable time for tracing before being compelled to mark his surface claim.

Seventh. I have understood that parallel seams of the outcrop of the Comstock lode were located by different parties, but

Eighth. As I understand the law, in all such cases the older location takes the whole vein as soon as the identity of the two seams is established.

Ninth. It will very rarely happen that the outcrop of a lode will be wider than the legal width of claims. The width of claims will not be restricted by local regulations in districts where the outcrop is too wide to admit of such restriction, and I have never heard of

an outcrop wider than six hundred feet unless the lode owned by the Richmond and Eureka Consolidated Companies at Eureka, in this State, is an instance of such excessive width. But if such a case should occur, the lode could be located under the act of 1872; the surface claim would extend three hundred feet on each side of the center of the croppings. Under the surface the locator would have the right to follow his vein to the foot-wall on one side and to the hanging wall on the other; and, as the law never sticks at trifles, what he could do immediately under the surface he would probably be allowed to do on the surface itself.

Tenth. I know of no instance in which the outcrop of a narrow lode has deflected as much as 300 feet from a straight line drawn between the extremities of the surface tracings on the lode; they often deviate more than 25 or even 50 feet from such a line.

Eleventh. I am not conversant with the practice referred to in this question.

Twelfth. I have not seen an instance of the case supposed in this question; but, in my opinion, if B had obtained a patent for his claim, it would be no greater cloud upon A's title to the dip of his lode than would be constituted by any other title to B's surface ground, such, for instance, as an actual possession by inclosure and residence. Title to that part of a lode which extends in its course downward beyond the side lines of the surface claim, has this inherent defect: the owner of the lode in following it into the land of another must always assume the burden of proving the continuity or identity of the lode he is following with its top or apex within his own surface lines; so, also, if the owner of the land into which it extends attempts to mine upon the dip of the lode, he can only be prevented by making the same proof; and this whether such adjoining land has been claimed for mining purposes or for any other purpose that gives title to the surface.

Thirteenth. I have already stated in another connection that within my knowledge no title to valuable mining property in this State has been exempt from attack. The owners have been obliged either to buy up conflicting claims or encounter expensive litigation. But most of this litigation arose out of the defects of the old system of locating vein claims without reference to the surface, and the various uncertainties of the local regulations and mining records. The act of 1872 has effected a great improvement, and if it had been better understood and more closely followed by the miners, the improvement would have been even more marked. But the miners have gone on, or at least did for awhile, locating the vein and treating the surface as a mere incident thereto, ignoring the vital necessity of defining their locations by monuments on the ground. Most of the recent mining litigation has arisen from this cause, or from the alleged failure of locators to do the requisite amount of work on their claims, or from various causes antedating the act of 1872. As yet there has not been time for a great amount of litigation to arise out of attempts to follow lodes on their dip beyond the side lines of locations, or from attempts of claim holders to mine on lodes dipping into their surface lines from outside locations. These seeds of strife are, however, germinating, and

Fourteenth. There can be no doubt that the retention in the United States laws of the provision allowing locators to follow on the dip of their veins outside of their surface lines will occasion more or less litigation in the future. There will be actions to prevent owners from so following their lodes, and other suits to prevent owners of land from mining within their own surface lines.

But I feel bound to add that, according to my observation, the right to follow the lode they have discovered as deep into the earth as it is practicable to work it is a right upon which the miners set the highest value. Any infringement upon it would be regarded by the miners of this State at least with intense hostility; and although a system of square locations, such, for instance, as the old Spanish system, might possibly prove of superior advantage in the end, I am satisfied that its adoption would be regarded as a grievance by the present generation of miners, and that its first effect would be to discourage prospecting.

Fifteenth. I have drawn up more than one set of rules for miners about to organize a district. I did this for the first discoverers of the Eureka mines, but am not sure that my rules were adopted. I think they were too short and simple to suit. At any rate the district was afterward reorganized and new and elaborate rules adopted. It was a common thing for a half dozen miners (*i. e.*, locators) to organize a district, and on these occasions aliens participated as freely as citizens. They always chose a recorder, and sometimes a president. The president's duty was to call and preside at meetings and to authenticate their resolutions by signing the minutes in which they were recorded. The recorder's duties were more important. It was his business to make and preserve a record of the written rules of the district, to act as secretary of all meetings of the miners, keeping a record of their transactions, and especially to file and record notices of claims, for which purpose he was sometimes required to go upon the ground and note the locality, with a view to the prevention of conflicting locations and the floating of claims. Usually there was but one book for recording everything, rules, resolutions of meetings, and notices of location, and not infrequently this was a little book that could be carried in a man's pocket.

Sixteenth. I have already stated in my second answer that the fundamental idea of a mining location was the taking actual possession of a limited quantity of mining ground. Miners' rules were strictly obligatory upon one point only, viz, size of claims. For the rest they merely prescribed the acts which should be deemed to constitute or be equivalent to an actual possession of the claim. No miner could hold by any means more ground than the local regulations allowed him to take, but if he chose to ignore the rules in other respects, and to incur the trouble of taking and keeping actual possession of his ground, such possession was just as efficacious as compliance with the rules. The only reason why locations were so frequently made under the rules and so seldom by acts amounting to an actual possession, was that the former method was vastly more convenient and less burdensome. The rules dispensed with the necessity of doing a great deal that would have been essential to an actual, open, and unequivocal possession, especially of lode claims, which at their first discovery were seldom capable of definition by marks on the ground.

From this it will sufficiently appear that the posting and recording of notices of claims were merely acts of possession and had that effect. The notice posted on the claim defined it by verbal description and showed the names of the locators. But this notice was exposed to destruction by the elements, and to the danger of removal or alteration by strangers, and so its record was provided for, principally in order to secure permanent evidence of the date and description of the claim. For the purpose of proving the *date* of a claim the record, when free from any appearance of alteration, was very conclusive evidence, and, as to this particular, fraudulent alteration was almost impossible, owing to the fact that the book was filled with records of claims in consecutive order, and one could not be altered as to date without altering those preceding and following it. But as a description of the claim the record was generally worthless, consisting as it did of a mere copy of the notice, with a certificate that it was recorded at a certain date. The requirement of the statute that the record, to have any effect, shall contain a description of the *locus* of the claim is a great improvement upon most of the miners' rules formerly in force.

The effect of recording a notice within the time prescribed by law was to satisfy one essential condition upon which the claim might be held without actual possession and to keep it good during the time allowed for doing the requisite amount of work. Doing the work perfected the claim. If each successive step after posting the notice of claim was taken within the prescribed periods, the effect was to give the locator a good title relating back to the posting of the notice and cutting off all intervening claims. And when a notice was recorded after the expiration of the time allowed for that purpose the claim was still good as to all the world except intervening locators, and could be kept good, like any other recorded claim, by doing the necessary work.

Seventeenth. No one had a right to amend or alter the record of a claim; but alterations of mining records were in fact often made, sometimes with fraudulent intent I have no doubt, but much more frequently with innocent motives, the recorder and locators supposing that this was a proper way to correct mistakes of description in the notice or to effect transfers of interests among the locators or to their grantees or assigns.

Eighteenth. I have seen frequent attempts to prove fraudulent manipulation of mining records, and although they were rarely successful, the fact that they were made proves how little confidence there is in the authenticity of such records. It is certain that there is no adequate security against the loss, concealment, destruction, or fraudulent alteration of the records of many mining districts.

Nineteenth. I am decidedly of the opinion that it would be highly advantageous to abolish all mining-district laws, customs, and records; to put the whole law of locations into the statute-book, and to confide the making and keeping of the necessary records to public officers, whose fidelity is secured by bonds and their oath of office.

The record of claims, I think, ought not to be made obligatory but merely permissive, as a means of holding the claim (of 1,500 feet of the vein) during such reasonable time as the statute may allow for tracing its course with a view to the proper location of the surface lines. For the purpose of making such records I think it would be better, if practicable, to allow county recorders or registrars of deeds in the respective States and Territories to act as mining recorders, rather than to compel miners in all instances to resort to the United States land offices, which are often very remote from the mining districts.

Twentieth. I am not advised as to the feeling of claim-holders upon this question.

Twenty-first. I do consider it desirable to retain the leading features of the present law for the location of lode claims, at least in those sections of the country where the mineral deposits come fairly within the definition of a lode. For other districts another system of location may be desirable. But whatever system is to prevail in the future, I think there is no doubt that all local mining-district laws, customs, and records should be abolished. The mode of defining claims should be clearly prescribed in the statute, and so also should be the amount of work necessary to hold them and to entitle the holder to a patent. Nothing should be made obligatory in order to obtain a

patent except the discovery of a mineral deposit, the clear marking of a claim including the discovery and the doing of the necessary work. But if the present system of locating lode claims is retained, the law should be so amended as to allow the discoverer of a lode, if he desire, a reasonable time for tracing its course before marking his surface claim, and should protect him in the mean time to the full extent of his claim on the vein. This privilege should be conceded upon condition that the discoverer should post a notice of his claim on the ground and record it within ten days with a description of the *locus* appended. This being done, he should have, say, thirty days after the record to set the stakes or erect the monuments required for marking the surface claim. Until the location was so marked he should be required to prosecute the work of development with diligence.

I have no other specific amendments to recommend, but I wish to call attention to a class of difficulties likely to arise under the existing provisions of the act which ought to be obviated if possible. How this is to be done I confess I am unable to point out, but the matter is of too much importance to be ignored in revising the law.

Mining locators are granted the exclusive right of possession of their surface claims, and all veins, &c., the tops or apexes of which lie inside of their surface lines extended downward vertically, although such veins in their downward course may extend beyond the side lines of the surface claim. No locator, however, has the right to go outside of vertical planes conforming to his end lines, notwithstanding the true dip of his lode would carry him beyond. In every patent of mining ground a right is reserved to other locators to follow their lodes on their downward course into the ground so conveyed. (Revised Statutes, section 2322.)

This being the law the annexed diagram illustrates a few of the numberless difficulties that will occur in applying it to surface locations that have not been made in exact conformity to the true and ultimately ascertained course of the lode. The line O P represents the course of a lode extending due north and south, and is supposed to be drawn between its extremities at the depth of a thousand feet from the surface. The dip of the lode is to the west and the outcrop appears at two points *x* and *y*. The top or apex of the lode where it does not reach the surface is indicated by the dotted line connecting *x* and *y* and extending beyond in either direction. Long before any better means exist of ascertaining the true course of the lode than is furnished by its outcrop A makes a location at *x* marked *a a a a* and B makes a location at *y* marked *b b b b*. In due time their claims are patented. Then C discovers the lode at *z* and makes his location *c c c c*, and later still D and E make locations as indicated, north of A and south of B respectively. The straight dotted lines A *a* A′ *m* B*b* and B′*b* indicate the sections of the lode the tops or apexes of which are inside of the surface lines of A, B, and C respectively. The dotted lines *d a* and *e a* and *f b* and *g b* show the sections of the lode which are included by vertical planes conforming to the end lines of A and B respectively.

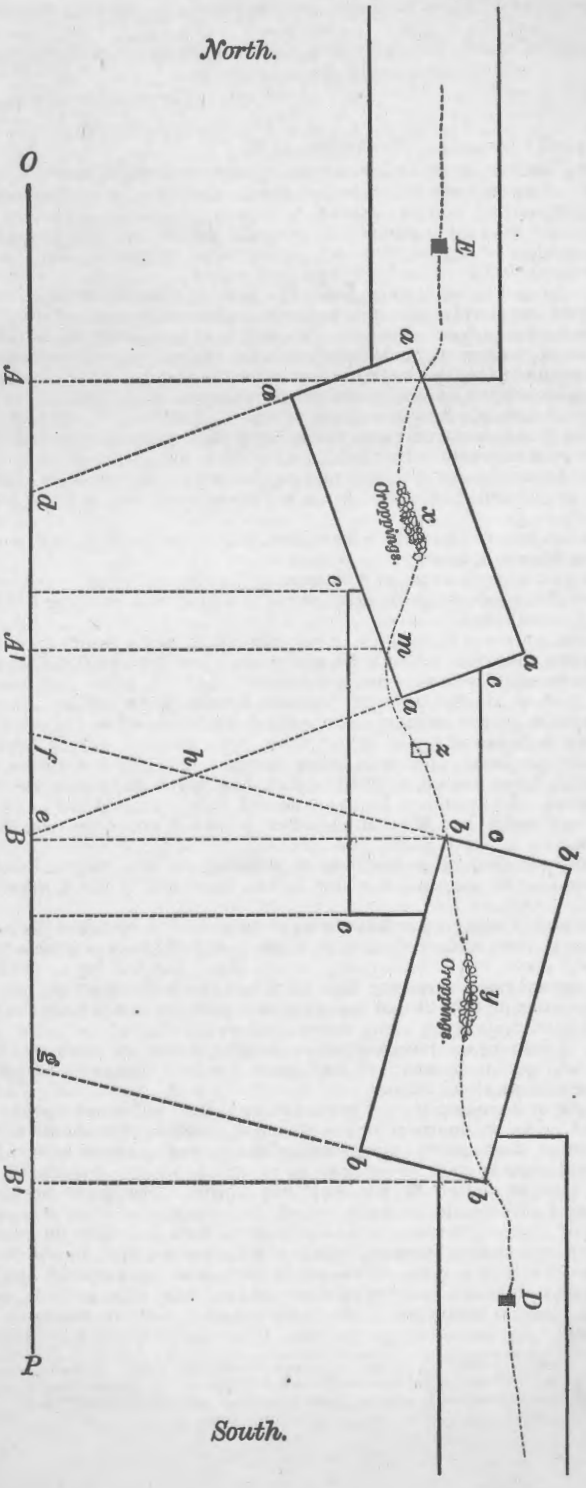
Now come the difficulties. According to my definition of top or apex of a lode, and under what appears to me the only admissible construction of the law, C, although he locates after the patent to A and B, is nevertheless the owner of all that section of the lode included by the lines A′ *m* and B *b*, indefinitely prolonged, notwithstanding it is mainly included from the very top in the prolongation of the end lines of A and B. C is the owner because he has located the top or apex, and A and B are not owners for the reason that their claims do not include the top or apex of this section. Supposing the lode to be valuable, it can readily be seen what controversies will arise as the progress of development begins to show the true course of the vein, and enlightens the parties as to their boundary rights. Even without the intervention of C, A and B would come in conflict at *h* in regard to the widening section *f h e*. But in the case supposed, C would restrict A to the line A′ *m* as his southern boundary, and B to the lind B *b* as his northern boundary. By this means A and B, being restricted by their end lines from mining on the widening sections A *a d* and *g b* B′, would be completely cut off—A at 2,000 and B at 3,000 feet from the surface. Then this further difficulty would arise, that the entire top or apex of the lode being included in the various surface locations of A, B, C, D, and E, there would be no means under the law by which the widening sections A *a d* and *g b* B′ could be located or granted. The only remedy would be to cancel the patents of A and B, and allow them to readjust their surface lines. Before this, however, another controversy would have arisen between B and C, and still another between B and D, in regard to the excessive claim of B on the course of the lode, which it will be seen extends to a length of about 1,600 feet, whereas the law allows him at the utmost but 1,500 feet. These hints will suffice to indicate the nature of the task which the commission have before them; and having no plan to suggest for meeting the difficulties in their way, I take my leave of the subject.

Twenty-second. I have formed no opinion upon this point.

Respectfully,

W. H. BEATTY.

The PUBLIC LAND COMMISSION,
Washington, D. C.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Testimony of Edwd. R. Chase, civil engineer, Elko County, Nevada.

The questions to which the following answers are given will be found on sheet facing page 1.

WELLS, ELKO COUNTY, NEVADA,
September 12, 1879.

To the Public Land Commission, Washington, D. C.:

GENTLEMEN: Your circular letter asking replies to certain interrogatories, &c., is before me. Holding in view the object of the Commission—*i. e.* the scope of inquiry adopted, and the method you have taken to obtain the information sought—I find it my duty to declare it as my opinion that you will gather but very imperfect information upon the subject of agriculture and agricultural interests; and I bespeak your most careful consideration of our interests and wants.

We are a simple and unlettered people. We have a profound faith in those maxims that teach us that our government guarantees to us justice, humanity, and "the greatest good to the greatest number." Believing so, and that the public lands are the people's heritage, and held in trust by the government for the people, we hold that every acre "is and of right ought to be" dedicated as homes for the people. "The people" expresses a vast, silent, and passive quantity—an immense organ upon which any tune can be played that you desire the keeper to have uttered. Play us all you wish, gentlemen, but don't let us break down or go to pieces, because you wish different tunes played at the same time; and remember, in considering the replies you receive to this circular, that this "vast organ" don't give the replies that some individual is playing it.

1. My name is Edward R. Chase. I am a farmer, and live in Clover Valley, Elko County, Nevada.

2. I came to Nevada while it was a Territory, and have not been out of it since 1864, and have never crossed a county line within it.

3. I have sought to acquire an 80 "homestead" title; no other.

4. I have had the amplest means of knowing the practical working of the land laws in Nevada and elsewhere.

5. I know from personal experience, after refreshing my memory from memoranda, that it takes more than ten years' time, and costs more than $400, to get a homestead patent to 80 acres—the case was not a contested one*. I know and declare that in another case, that of H. H. Chase, my brother, whose lands adjoin mine, who made the earliest location in the country, who settled his lands when his nearest neighbor was 50 miles off, who never lived off of them, who claimed only a homestead, who never permitted any laches and was never charged with any unfairness, moved onto his lands, in 1867, has traveled over 800 miles, has spent $500, and has, like myself, received no patent. I have never known a patent to be obtained but in two instances; in one case it cost more than $75; in the other I do not know the cost, but do know it cost over $50.

6. I can hardly say that there are defects inherent in the system, but think a few important amendments should be made in the law, and many corrections in the practice.

1st. In this country many valuable pieces of land would be taken as homesteads if they did not lay so low in the valley as to make it wholly impracticable to live upon them. We want farms in the valley and homes along the foot-hills. The law should not require an actual residence upon the land, but the final proof should go to show that the homesteader neither owned nor claimed a more valuable home anywhere else.

2d. As only those lands lying along water-courses are eligible as farms the strips are often narrow. Taken in quarter sections (contiguous forties lying side by side) the claimant does not get on an average half good land. Contiguity by corners ought to be permitted in homestead claims.

3d. I can think of no reason why a homesteader should go before the register and receiver. I cannot make the journey for less than $50. Section 2290 should be so amended as to read: "before the register or receiver or the *nearest* magistrate" (whose official certificate should state such fact)—"that he is the head of a family," &c. Section 2262 should be similarly altered. All laws that require a sworn statement to be made of or concerning lands should be made before the magistrate living nearest the lands. The certificate of the magistrate should state such fact, and that he knows the witnesses, that they are credible persons, residing in the immediate neighborhood (in cases of final proof) While it is more expensive to go before the register and receiver, it opens the door to fraud, in a country sparsely settled like this, as it is more difficult to perpetrate a fraud at home, where the facts are all known to everybody, than at the land office, where they are known to nobody. The official character of the magistrate

* The only issue presented was, are certain improvements on the land. The owner says they are—a fact never questioned. It is charged as one of the hardships of the system that the Commissioner did and does, without any reason or necessity, order expensive contests, and involve the cases in delay and cost.

may be established by the seal of the county clerk, if necessary. Pensions are paid and bounty lands issued upon proof taken similarly; there is no reason, and great hardship, in not permitting it to be done with the land office.

The desert-land act is open to the same criticism—or rather not the law, but the rulings of the Commissioner. It is a grievous "put" upon us to compel us to journey to the county-seat with two witnesses known to the clerk to be credible and who are acquainted with the land. The law says "we may file an affidavit." The Commissioner takes it upon himself to say before whom that affidavit must be made.

The timber-culture act is similarly restrained in its operations. The act declares that the initiatory affidavit may be made before an "officer authorized to administer oaths in the district." The Commissioner by a recent ruling absolutely ignores the law, and will not, as I am informed by letter from the Land Office, accept of a filing made before a local magistrate. Laws are to be construed according to the intention of the law-makers. When the framers of the law used the language, "an officer authorized to administer oaths in the district," they as clearly meant any officer authorized to administer oaths as they did that an oath should be administered. When they said, as in the desert-land act, "may file an affidavit," they as evidently did not mean to direct before whom it should be made as they did mean to direct before whom it should be made in a homestead application. When they use the language, "shall make an affidavit before the register and receiver," &c., what difference can it make to General Williamson, to the country, to the cause of justice? As it makes none, and by no possible contingency does it make the Land Office safer against fraud, we must look for the reason in some way as appertaining to the Commissioner himself. We complain and believe that the Commissioner of the Land Office is an enemy of the homestead act; that he has stood defiantly square across the path of the homestead settler and fought us off with all the diablery he could invent. Authorize one of your Commission to come down among the people and take the sworn statement of the first dozen farmers he can find in Nevada; my word for it, you will feel it your duty to go outside of the act prescribing your duties and to report a code of rules of practice that will relieve the Commissioner of the obligation of exercising any discretion. The wrongs and outrages the local officers have perpetrated upon the people will never reach you, responsive to this circular; the farmers are, as I have said, voiceless; many cannot write; few can understand such terms as parceling surveys, physical characteristics, humidity of climate, and codification of laws; they know if they could have been permitted to buy their lands as desert lands they could have obtained them much cheaper than under the homestead laws. Local rather than general changes should be made in the law. We are wronged, and need legislation to repair the wrong.

1. The rule of double fees and commissions going to our land officers on this coast is simply a venerable swindle. When the rule was adopted it cost so much to live here that it was deemed no more than right. If their pay is not enough, government ought to raise it. We get poorer lands; have to travel farther to get them than any people do.

2. Our lands within railroad limits should have never been raised to double minimum. It is a fact, patent and clearly beyond question, that farms near the road are of less value than those remote, and the value increases as we recede. Reason: our markets are in the mining towns off the roads. And again, when farm produce is high the road enters always into competition with us, and we nearest to them get it worst. At the present time they are delivering baled hay for eight-tenths of one cent per pound, and charging us farmers $2.45 per cwt. for iron, salt, &c.

Our Representative in Congress has always been in the interest of the railroad company; hence I could never get these facts before the Land Committee. If our lands were reduced to $1.25 per acre the railroad company would have to reduce theirs.

3. The railroad lands ought to be restored to market. I have recently given fully my reasons therefor in a letter addressed to the Commission in Salt Lake City, to which I refer. The rules of practice need to be changed in one important respect: A man who makes an honest, fair location, pays his fees, and performs all the obligations the law imposes upon him, ought to be protected against expensive litigation. Instance: Mathews took east half southwest quarter, 12, 36, 59, Elko district, under the desert law; it was on the bottom, and not eligible as a residence; he worked for a man, and lived in a house 100 yards off the land; he owned no other land. A Mr. Joseph W. Allen made an affidavit that it was not desert land; he did so in order to set up a claim and get into possession and gather a valuable crop of hay; he entered and took off the hay. The General Land Office ordered a hearing; I attended the hearing for Mr. Mathews; he brought nine of his neighbors, who all testified that it was desert land. There was but little conflicting evidence. When the testimony was in, occupying three days' time, the receiver, Judge Carpenter, demanded $50 of him, which he paid, as an estimate of one-half the expense of hearing, &c. The rules of practice declare that the expenses shall be borne equally by the parties. The land is not worth $100; and it is wholly against legal precedent to burn a man and then make him pay for heating the poker. If Mathews had known that he not only had to pay all his witnesses, his attorney, and $50 besides, he would never have paid the money or contested the claim. The rules

should be so altered as to have the hearing before a magistrate, responsive to printed interrogations. Keeping the facts in this case in view, no hearing should have been ordered until Allen filed affidavits alleging that the land was such "that no agricultural crops could be successfully raised without irrigation," or that "there were springs or other natural sources of water on the same to irrigate all or a larger part of the same." Then the fact of its aridity would have been put in issue, and those questions, and only those, should have been asked the witnesses. The hearing was ordered on the testimony of Allen and another that the lands were not desert lands, he understanding desert lands to be lands that nothing will grow on without irrigation; whereas, as it transpired, a little hay could be cut along the swale any year.

I do not believe there can be adopted any system of land-parceling surveys, as no geographical divisions can be made and to preserve the topographical system in use correction and township lines must be adhered to; and as there appears to be no grave necessity for permitting mineral-land surveys to disturb them, I should recommend that the correction and township lines should be run that all irrigable and timber lands should be sectionized. I should adopt the following classification: All lands are *desert* lands; all lands are *pasture* lands; *timber lands* are not irrigable, and are such lands as are more valuable for their timber than for pasturage or minerals; *arable* lands are irrigable lands and more valuable for hay or grain raising than for any other purpose; *irrigable* lands are lands that it is possible to irrigate. Mineral lands being lands that are of no value for agricultural purposes, can only be defined as non-irrigable lands that are more valuable for the metals contained within them than the timber that covers them.

I would hesitate to recommend any other system for the disposal of lands than the present. I would repeal the desert-land act; it is in direct conflict with our homestead theory; it is an offer of a section of land at $1.25 per acre, while the homestead settlers are restricted to 80 acres within railroad limits, and pre-emptors to 160 acres, at $2.50 per acre, of precisely the same lands. I would so change the present law as that a failure to come forward and show that the lands had been redeemed and the law fully complied with within thirty days after the expiration of three years would work a forfeiture and a vacation of the location and the lands become restored to market.

10. In my view the better system sought for the disposal of the public lands would be to restrict all to homesteads of 80 acres or a less quantity contingent upon five years' residence and cultivation. It rests quite within the possible that a system of artesian boring may make our desert lands productive, and it is impracticable and un-American to create large land owners. If our desert lands are of some value for pasturage, the easement should in equity go to the settler nearest.

SUBDIVISION—AGRICULTURE.

1. I should divide our seasons into the wet and dry. We get very little rain during the crop-growing season. Snowfall in winter supplies us with means of irrigation in summer.
2. Answered in the above.
3. Not one acre.
4. Perhaps 1 acre in 1,000.
5. Wheat, barley, oats, and potatoes.
6. Am unacquainted with water measure.
7. All appropriated, and people quarreling over possibilities.
8. I think my land is gaining in fertility (owing to the waste of alkali).
9. Crops can be raised at an altitude of 7,000, I think; they are raised over 6,000. I think the ranches in Secret Valley, Humboldt range, are over 7,000. It is the popular belief that the higher we get the safer we are from frosts, and that if we could farm the highest ravines we would be secure.
9. In our vicinity we have small streams and use all the water we take out of them for irrigation. There are no general or local restrictions placed on the use of water other than the laws.
10. All water has been taken up by turning it out of its channel, under the act of 1866, sanctioned by local custom and the decisions of our courts.
11. So far only upon questions of fact.
12. I think all lands should be called pasture lands that are not irrigable; therefore conclude 999 acres in 1,000; but much of the pastoral lands is of little value for pasturage, and when once fed off are nearly worthless.
13. No. No.
14. No. No. Grant them to the State in lieu of swamp lands; let us have them for educational purposes.
15. Don't know.
16. Two hundred.
17. Don't know, as great changes have recently taken place. Our county once car-

ried more than 100,000. Our ranges are destroyed, and I think we will not winter 25,000.

18. Declined. Very much; fast disappearing.

19. No, they do not fence; but control the courts and so far have pastured our farms off and prevented the question of free range from reaching the supreme court.

20. I think not.

21. Springs and creeks.

22. Don't know.

23. Disappeared.

24. No.

25. None; some scolding.

26. Ten cattle to one sheep. Bands of all sizes.

27. None.

27. Very little, I think.

TIMBER.

1. Very little; mostly nut-pine.

2. None; we have no fencing, and my planting has been utterly fed off with predatory herds.

3. If at all, in 40-acre lots for fuel.

4. No.

5. None,

6. No destructive fires.

7. No despoiling; all used for fuel.

8. No restraint; take all you need.

9. No; it would only be another source of revenue to the most corrupt set of officials ever known. The entire gap between the first register, Davis, and the last receiver, Carpenter, in Eastern Nevada, both of whom are unexceptionable gentlemen, has been filled with unworthy, unjust, bad men, that have oppressed and robbed everybody. No better men can be found in any department of government than the present officers in this section, but we all fear their removal on that account, and to leave the lands in the hands of men who can bounce us for nipping a load of fire-wood would be hell. When John S. Mayhugh was register of the Elko office I once received a business proposition from him to report Crawford of spruce anent, and others, and he would cinche them and divide. The same officer told me that he went to General Williamson in Washington to get some business done; he referred him to a clerk, and he had to stand blackmailing of the grossest kind. You have my authority and the data.

LODE CLAIMS.

1. Have litigated many claims; am or was a mining engineer; am a civil engineer

2. I have little useful knowledge on the subject.

3. Doubt the wisdom of it. Don't know.

4. Croppings. Line of strike as well as angle of dip change very much in the small veins of Eastern Nevada. No man can tell where a vein runs without following it.

5. When veins are narrow and near each other it would be the safer way to confine all within the limits of a superficial survey, because "faults" are so common and the slides so extensive that when a vein is once lost there is no defining it when found. It is generally assumed that the first one struck in the line of progress is the one lost. There is no certainty of it; lateral faults and dikes often obscure the question, and it is the principal source of litigation. I would make no survey a test. Let him who first discovers a vein locate under or above ground and define his rights thereto in the courts. If he thinks his neighbor is on him, trace him off.

7. Frequently; and have known them to run together, and have known them to do the opposite.

8. Answered, no.

9. No; I have never seen one. Ore is frequently scattered over much surface, but when the vein is reached within walls I think it will in all cases of fissure veins in Nevada be inside the limits.

10. Yes; not so frequently from the angle of dip as from slides.

11. Disadvantage, I think.

12. Such is unquestionably the evil of permitting false locations, and whether or not injustice has been done, it is clearly the case that it can be, and individual cases will not help the question, although there are many.

13. Yes.

14. They should be unquestionably permitted to do so.

15. Five or six, none of which are now important. It is usually done by prospecting parties, consisting of two or more, electing a secretary and president and adopting laws. Usually a copy of a code is carried on such expeditions.

16. Parties then record their "finds."

17. I know of no rule or precedent for amending it.

18. It used to be frequent; I do not know how to prevent it.

19. I have given the question mature deliberation. I see many objections to it. Prospectors find what they hope is good; they wish to secure it; other parties are prospecting all around them. Written evidence of some person authorized to make a record is the one thing needed. It is possible that a rule requiring all mines that the owners wish to preserve after one year or more should be placed on record at the local land office would do, but with the record the Land Department has made for itself I think the miners would make a mutiny.

20. There is grave doubt about it. The courts appear to be the safer, but involve much more delay and expense. I would not have confidence in the Land Office; others might.

21. "It is better to bear the ills we have than to fly to others that we know not of," &c. The above idea has crystallized in many languages, in many ages, in many forms of words. It is my answer.

22. Yes; I think this answered in interrogatory 19.

PLACER MINES.

I have never seen one; my information on the subject is limited to statements of cases made by others.

SUMMARY.

First send you each his individual check to the Central Pacific Railroad and Union Pacific Railroad Companies for the expenses of your junketings across the continent to attend Grant's reception, and be at liberty to give an honest opinion.

2. Ask an investigation into the charges brought in this communication against the Land Office.

3. Leave the present system and the present local officers in their places. They are honest. For God's sake let the General Land Office try to conform to that method of business. It may be difficult at first.

4. After reading the pre-emption law, the homestead law, the desert and timber culture acts, reflect that they were acts made by the people for the benefit of the people; that they were intended to be, and of right ought to be, carried into effect in the cheapest and most convenient manner consistent with the act, due regard being had to ample protection against fraud. Then you will find that the pre-emption and homestead acts should be at once altered, so that all verifications could be and should be taken before the nearest magistrate; that the desert act and timber-culture acts should be carried out in the same manner. The only remedy in the latter cases is to convince the Commissioner of the Land Office that his rulings requiring the affidavits to be made before a court of record is wholly unjustified by law, inconvenient, and unnecessarily expensive. The county clerk and district judge are no more federal officers than a justice of the peace; there is no law to compel them to do any such business, and in our county they wholly refuse to do so. Claims for bounties and pensions, for commutation and back pay, and for military and all other claims against government are established by affidavits made in the manner indicated, the official character of the magistrate being verified by the certificate and seal of the county clerk. The difference in cost to me or any neighbor of mine would be $40 to $75. Why, then, does the General Land Office exact it? In the belief of nine-tenths of the farmers, that they may be hindered and discouraged from seeking government lands and purchase lands of General Williamson's friends, the railroad company—poor ostrich!

5. Government lands within railroad limits should be reduced to $1.25 per acre.

6 Railroad lands should—all that were not positively conveyed by the government before three years after the final completion of the road—be made subject to settlement and pre-emption like other lands, at $1.25 per acre, payable to the railroad company, for all future time, let whoever may pretend to be the owner. All lands accepted by the railroad companies after that time were subject by the act to that contingency.

7. All lands on odd sections within railroad limits, not conveyed at this time, should be withheld. They were unquestionably a gift; they were granted to them provided that they should keep their telegraph line and railroad track in condition, so that they could pay their bonds in the manner they had agreed to. It was no legal consideration. If it had been, even, it was declined; because section 3 indicates when they were to accept it—when a section of 20 miles had been completed and accepted, then bonds shall issue, &c. The law cannot bear the interpretation they seek to give it; it would be unconstitutional. Congress had and has no power to dispose of the public land in such a manner. It would not be a "needful rule or regulation," and would be clearly against the "general welfare." When a latent ambiguity exists, a law is to be interpreted at all times consonant with the Constitution. A gift is a gratuitous offer; it cannot be *in futuro*. Not being based on a consideration, it cannot be enforced.

With great respect,

EDWARD R. CHASE.

Testimony of Gov. William A. Howard, Hon. Granville Bennett, and others, Yankton, Dak.

YANKTON, DAK., *November* 7, 1879.

The Public Land Commission:

GENTLEMEN: In response to the request of the Commission, I have the honor to submit the following remarks upon the subject-matter of your inquiry. These responses are prepared upon a few minutes' notice and are written off without review, but spring from previous thought and considerable experience.

1. I was for about four years the United States surveyor-general for Dakota Territory, and have executed numerous contracts upon the public land surveys within Dakota, besides examining, as inspector, the work of many other deputy surveyors. These duties have taken me over the whole of Dakota, except the extreme northwestern part, and over much of it repeatedly. I am forty-two years of age, was born in Indiana, and have always lived in public land States or Territories. Am a graduate of the University of Michigan, both from the literary and law departments, and have had some practical familiarity with surveys since I was sixteen years of age.

2. The public lands of the United States are an important trust for the people, and are to be used mainly for two purposes: (*a*) to furnish cheap homes for citizens; (*b*) to aid in fostering free public schools. There are mining interests, of course, to which I do not refer now; and the grazing interests are deemed agricultural. For all these purposes, especially for all agricultural settlements, the lands must be kept cheap. The policy of the nation has uniformly observed this necessity. There is no purpose to create much revenue from these lands. We do not doubt but this is the correct theory, and that it will continue to be the practice. This, then, demands an economical system of surveys for all agricultural and grazing lands. That necessity is at the door of the inquiry, from my point of view.

3. The present system of rectangular surveys is economical. The cost at present is but little over three cents per acre, including pay of deputy surveyors, the salary, office and assistants of the surveyor-general. This cost cannot be reduced in any part if the system is retained; and no other system that I have seen proposed can be substituted without a very great increase in cost, which would necessitate large appropriations of money, or a marked and very unpopular advance in the price of the lands. It would endanger the homestead system, now so popular and giving such excellent results in the Northwest and West. I fear that we should soon have a demand that all lands be sold at double minimum price, instead of given for residence and small fees.

3. There would be little use in a more accurate and careful survey unless more permanent and far more expensive monuments were planted to perpetuate boundaries. The present monuments are of wood or stone, further aided by mounds of earth and pits. There is a long remove between these and any other material. The next practicable materials are iron or pottery. I have not data as to probable cost of these in the field when used, but it must be many times that of wood or stone.

5. The present system of surveys is reasonably accurate and uniform so far as I know it. It conforms closely to measurements and tests otherwise independently applied in engineering operations for public works. The distance from Dubuque to Sioux City, Iowa, as traversed from railroad engineering and public-land surveys, agrees. That on the public lands was done by many different deputies at differing seasons, when they were exposed to dangers (one lost his life), and received small pay. The railroad engineering was by one party with most ample equipment and good pay, and was a continuous line. When Lieutenant Warren made a journey through Southern Dakota many years ago, he located some points astronomically. This was before public-land surveys. From these and similar data the first official maps were made. When the public-land surveys were extended over this region they concurred with those points so fixed, and connected, sometimes many miles, all topography otherwise obtained and mapped. Other like proofs of reasonable accuracy are obtainable in many places. This is true along the Northern Pacific Railroad. But the same or similar tests will show errors in land surveys. Sometimes these errors are bad. They arise from a gross violation of duty by deputies; from a lack of skill, or, more often, a great lack of integrity. But these errors are mainly local and limited. The rectangular system checks its own errors, and leaves its fractional excess or deficiency at regular recurring places. These errors are measured, ascertained, noted, and checked. I also testify my belief that these errors are largely of the past, and that now very creditable and accurate work is done. This the government can secure uniformly by an inexpensive system of inspection, now used in part.

6. Correctly executed, with posts of wood or the stone monuments (both used now by many, the post for section and the stone for quarter-section corners), the charred stake, and the mounds and pits, the surveys endure very many years. I think when so built, as I believe they now are by every deputy surveyor in Dakota so employed, and finished according to the law and instructions, they reasonably answer the requirements of an economical land system. If we had feudal estates and vast and

valuable private domains a more expensive system would be desirable. The present serves its purpose until the greatly increased value of the lands as private property shall justify private owners in replacing government monuments with costly and permanent ones.

7. The rectangular system should by all means be retained so far as agricultural settlement is expected to extend. Its nomenclature is perfect. No other could be substituted wholly for it. The distinctive features of that must be maintained for a popular system. It is quickly understood by native and foreign immigrants alike. Any departure in agricultural regions must, therefore, be but partial and subordinate to this, dependent upon it and assimilated to it. This supposes that in certain cases, as in small hilly tracts, bends of rivers, on shores of lakes, where the lands are only suited for pasturage and are exceptional, where considerable forests occur, and in similar cases, it would be desirable to have larger or irregular tracts. I further remark why the rectangular system should be retained, speaking especially as to Dakota Territory:

(*a.*) East of the Missouri River this system is largely extended and is advancing toward completion. The standard lines are run and established much beyond the subdivisions in places. The exterior township lines dependent on these are partially established also, and the subdivisions are irregularly advanced within these. A large area is sold and settled upon and cannot be disturbed. Thus the only feasible plan is to complete this system at least to the Missouri River.

(*b.*) The act of Congress organizing Dakota Territory and providing for establishing the office of surveyor-general therein is a sort of public contract with all settlers and with the people in their governmental capacity that this system should continue.

(*c.*) The same act reserves sections 16 and 36 in every township: "Are reserved for the purpose of being applied to schools in the States hereafter to be erected out of the same." (12 Stat., page 243.) This involves the highest interests and good faith, and I cannot see how it can be violated or its pledges fulfilled under any other system. Now, holding the office of superintendent of public instruction for the Territory, I know how large an interest this is and how important a place this inchoate resource holds in the just expectations of our citizens.

(*d.*) There are grants to railroads, mainly to the Northern Pacific Railroad Company, whereby alternate sections are donated for the building of that important highway. This line is constructed nearly to our western boundary, and the surveys within a grant eighty miles wide, with twenty miles additional for indemnity lands, are in every stage of advancement, from completion at the eastern border to partial beginnings far west of the Missouri River.

(*e.*) Our general and local laws, in fact to a considerable extent our local government operations, are based upon rectangular surveys. With slight exceptions the boundaries of counties, townships, school districts, and other subdivisions coincide with and are described by this system. Unorganized counties are declared partly in advance of surveys by theoretic lines soon to be run, so settlers may know upon what to depend in these respects. Our tax laws, our legal forms, and often the very jurisdiction of our courts, rest upon these lines. They are an indispensable public convenience.

8. With the exception of the Black Hills and the Bad Lands of the White and Little Missouri Rivers, and limited adjacent regions, and some undetermined area in the northern or northwestern parts, Dakota is a series of vast plains, over which this system can be extended as feasibly as over Iowa or Eastern Kansas or Nebraska. It therefore seems that over all but the southwestern part, and over much of that lying toward the Missouri, the rectangular system should extend. I do not here intend to say that it should not extend over much of the regions excepted.

9. Strongly convinced of the merit and the practical success, and even legal necessity of this system, and believing it to be now very excellently and faithfully executed, I would yet not object to a certain limited modification of the practical work. So far as the standard parallels and guide meridians are concerned, it would perhaps be as well or better to expend more money and greater care upon them, and to fix the monuments thereon with permanent materials. The standard lines as these are called are the real geographic lines. They are connected and continuous. The parallels are intended to be true parallels, having the curvature due to their latitude and the oblateness of the earth and to run continuously and without break east and west. The guides are less important and check between the parallels. If these lines could be run and established by careful triangulation and their corner boundaries permanently marked, the errors of the present system, which are not great now, would then be immaterial even for geographic and other considerations above the mere demands of parceling and selling lands. While saying this I yet contend that lines have been run and are now being run in this Territory—even in the Black Hills, over its roughest parts—that will stand severe tests. They have not all been so run, and I wish to see all the standard lines thus precisely established. But, I repeat, I do not regard it even practicable and by no means necessary to carry this to all the details. If in extending the standard lines thus by triangulation a region is found demanding by its mount-

ainous character the same care in its details or other departures from the general system, the change could be specially and locally made. I do not see any objection to pushing this system of standard lines over the whole interior, for it would thus furnish the convenient base lines and initial points conveniently at hand for all the modifications of the system required by the features or characteristics of any particular region, large or small. So I would preserve the rectangular system and its nomenclature and subdivisions wherever convenient or best adapted to the country as it is in nearly all Dakota.

10. The present system of administration under surveyors-general I would retain. It is easily shown, I think, to be most economical. The same work cannot be done for the same cost in Washington City. The survey office should be near the local land offices, and in the general region to be surveyed, where it can observe all the facts which bear upon the questions before it. Thus it should observe the volume and tendency of migration and the probable future tendencies of settlement. It should know something clearly of railroad and other enterprises which would affect given regions and require surveys. Not the least of its intelligent duties is to know the agricultural successes and failures, their causes and permanence. These all bear directly upon the question of surveys, and they can never be properly known except by a *resident* officer. As to mineral surveys, it seems that a surveyor-general and his local supervising office are a necessity. In no other way can the interests be accommodated. The interests subserved by the office are more local than federal, and all the bearings of the duties can be properly observed and weighed only by a local office. His responsibility to the general government can be as well provided for as if his office were in Washington City, while his public usefulness is far greater.

11. Dakota Territory has a larger body of unsettled but valuable public lands that are agricultural without irrigation than any other three surveying districts combined. It is nearly all agricultural. Its present crops testify this. East of the Missouri River 95 per cent. of it is so fit for agriculture, and a large part of this is first-rate. West of the Missouri a smaller per cent. is agricultural and a large part is grazing land. Even there close about the Black Hills agriculture has shown remarkable success.

12. The Black Hills I have examined and would like to describe, but time does not permit. I have no personal interests there now nor prospectively. I testify disinterestedly. The people are enterprising and of the best material, having only a small element of lawless persons. They have as good schools as many older regions. The teachers are educated and efficient, and the mental capacity of the pupils is rather above the average. I have visited nearly all the schools there. The country contains vast wealth, which is now rapidly developing. To me the examination opened wonderful resources, and I believe within a very few years it will be regarded as the most wonderful region upon the continent for wealth in gold. Its present showing deserves the consideration of the government.

These views, opinions, and facts are stated upon my knowledge and candid belief, and are convictions formed from eleven years' residence in Dakota. They are not influenced by any fancied or real personal interest, but rest on the facts and public interests. The rapid work in writing them leaves many other arguments that occur to me unmentioned.

The present settlement laws of the United States are as applicable to the lands of the United States in the Territory of Dakota as they were to government lands in the States of Iowa and Minnesota, excepting there should be new and stringent legislation enacted in regard to the care and preservation of the timber lands belonging to the government in the Territory. The mining region, known as the Black Hills, in the southwestern portion of the Territory, of course, comes under the present mineral laws of the United States, and would be affected by any changes in such laws the same as other precious mineral-bearing regions.

I have the honor to remain, very respectfully, your most obedient servant,

WM. H. H. BEADLE.

The following were all present and fully concur in the within: Gov. William A. Howard; Hon. Granville G. Bennett, Delegate in Congress; Major F. J. DeWitt; Judge W. W. Brookings; Hon. William P. Dewey; G. A. Wetter, register, land office; Lott S. Bayliss, receiver, land office.

Testimony of Robert M. Catlin, civil and mining engineer, Tuscarora, Elko County, Nevada.

The questions to which the following answers are given will be found on sheet facing page 1.

To the Public Land Commission:

GENTLEMEN: I have been instructed to answer such of the inclosed interrogatories as may be within the range of my personal information. Having been absent from

home for some time, I did not receive the paper as soon as otherwise I should have done; hence my delay in obeying the instructions therein contained. I will refer in each answer to the number of the question, without restating it.

1. My name is Robert M. Catlin; reside in Tuscarora, Elko County, Nevada; profession, civil and mining engineer.
2. Four years and a half.
3. No.
4. My experience has been confined to mining-lode claims.

5 and 6. About $325 for a lode claim, and the time varies from six months to three years. I cannot understand why (as is frequently the case), when an application is forwarded to Washington, after passing through the local land office, it should there remain so long without hearing something of it. If it is informal, the applicants ought to be notified at once. I have known patents issued before another which was applied for two years before it had been even heard of, and after a while the last, which should have been first by years, comes, and meanwhile the applicants have heard nothing. The above facts would give color to the impression prevalent here that when a mining patent is applied for it is quickest and cheapest to fee some patent lawyer in Washington (of whom there are many) claiming to have "immense facilities," &c. The present rules may be good enough, but there certainly is something wrong in their working, and mining men are beginning to feel that it takes so long to get a patent that it is hardly worth while to apply for one, as in nine cases out of ten they can work out the ore-body contained in their claim long before they can get a patent. Hence the government loses not only the price of the land, but also the mineral is rapidly being taken from the government lands by a sort of skimming process.

7. Elko County contains a large amount of grazing land and a great amount of mineral wealth. There are a few valleys where barley is grown by irrigation, and the timber grows in little patches in the mountain gulches. Very little timber.
8. In our vicinity, I opine, a general rule would be about the only way practicable.
9. The present system appears to work very well. I have been county surveyor.
10. Have never thought of any better plan.

AGRICULTURE.

I know very little about agriculture, as it is but very little followed here.

TIMBER.

1. We find wood in the mountain gulches and on the mountains, but it is not abundant. Willow, quaking aspen, and alder are found in the gulches, while white fir and a scrubby pine are sometimes found on the mountain sides.

LODE CLAIMS.

1. Have been United States mineral deputy surveyor for four years in Elko County.
2. I have found that locators make their locations in such a haphazard way that often it is almost impossible to tell where their claims were originally situated. They locate upon the first discovery of mineral, without much prospecting to determine the course of their ledge. Frequently they locate at right angles to the course of the ledge, and another comes along, and finding, as he supposes, a cross-ledge, locates in good faith. Soon, however, the first party finds the true course of his ledge and orders second party off, and, having pulled up his own original stakes, resets them, and second party has no remedy for it. May be he has gone on in good faith and expended his money freely, while first party lays back and lets him prospect, and when he develops the course of the ledge first party claims it, knowing that there is no record of the original course of his claim, and being able to prove priority of location and that the second party is on the same ledge and within distance of his location point, it frequently happens that great injustice is done. I have often thought that the law should require a locator to designate the courses of his claim. Nearly every prospector has a compass, and in case a surveyor is not available he can himself describe his boundaries with sufficient accuracy. In case a surveyor is available, as is usually the case in most camps, his records would save many a dollar to men who now are at the mercy of any prior locator whose location point is within a quarter of a mile of him.
3. If some such provision were made in the present law, I think conflicts under this head would be avoided.
4. I think the apex of a vein is the line such vein would make in its intersection with the surface, calculated from its true dip at each point. The course and dip may usually be determined within a year from location.
6. Occasionally, but rarely.
7. Very rarely; once or twice.

8. The claims have not been of much value and are not worked.
9. Very rarely; never in my experience.
10. Very often.
11. Frequently to disadvantage.
12. I have never known of it being done.
13. Sometimes; very rarely.
14. I think the present law adequate.
15. Never.
16. The notice usually only gives the number of feet, names of locators and of claim.
17. No.
18. No.
19. Yes.
20. Yes, much more satisfactorily.
21. I think of no other suggestion than that contained in No. 2.
22. Two years ought to be long enough.

Have had no experience in placer claims.

Respectfully,

ROBT. M. CATLIN,
Tuscarora, Nevada.

Testimony of B. F. Leete, Reno, Washoe County, Nevada.

The questions to which the following answers are given will be found on sheet facing page 1.

L. & M. EAGLE SALT MINE,
Reno, Washoe County, Nevada, December 6, 1879.

Public Land Commissioner:

DEAR SIR: I have imperfectly appended my answer to a few of your questions. The waters of the Truckee River flow to waste from October to May, about six months of the year, at least 75 per cent. of the annual flow. Of the balance not more than one-half is utilized.

From the inclosed printed slip you will gather my idea as to the food-producing resources of this State. They lie more in the waters of irrigation than in the land. A monopoly of the waters gobbles up everything in food-producing resources, makes farmer-boys tramps, reduces good men to desperate want. The conformation of our country is such that the Truckee River can be turned into dry basins and held from October to May and then drawn for irrigation. Let the waters of irrigation of the Truckee be appropriated to the State. Let the State have one-half million acres arable desert lands, proceeds of sales to be applied to constructing irrigation canals, State to maintain canals; let no man have more than 40 acres of irrigable land; that after five years' occupation and cultivation furnish him water at, say, $1 per acre per annum; proceeds to support State government; then will the waste water of the Truckee make the desert a happy and prosperous home.

For short,

B. F. LEETE.

JOINT RESOLUTION petitioning Congress to donate 500,000 acres of arable desert land to the State of Nevada for internal improvements, the proceeds of such land to be applied to constructing irrigation canals for the purpose of developing the food-producing resources of the State, because—

First. As a people we are buying our food from neighboring States.

Second. The permanent wealth and prosperity of the State lies in the development of its food-producing resources.

Third. The food-producing resources of this State lie in arable desert lands and the waters of irrigation.

Fourth. The arable desert lands in their desert state are valueless.

Fifth. Such lands can only be made productive and valuable by irrigation.

Sixth. That a holding or controlling of the waters of irrigation controls the food-producing resources of the State, therefore the waters of irrigation should be appropriated to and vested in the State, the State to construct canals and deliver the waters for irrigation, at such rates as may be fixed by the people from time to time, forever, thereby placing the production of food to his own use and benefit within the reach of laboring men, and for this State within this State: Therefore, be it

Resolved by the senate (the assembly concurring), That our Senators and Representatives in Congress be requested to lay this subject before Congress, to the end that a grant of arable desert land of at least 500,000 acres shall be had to this State, the proceeds to be applied to internal improvements in the construction of irrigation canals for

developing the food-producing resources of the State. Such land to be selected from any land eligibly situated for irrigation along the line of location of such canals, and within a belt of ten miles in width on either side thereof: *Provided*, That not more than 80 acres shall be conveyed by the State to any one citizen or person after actual residence and cultivation for a period of five years.

Testimony of Thomas J. Read, Eureka, Nev.

Thomas J. Read, Eureka, Nev. Been engaged in surveying mines seventeen years; since the passage of the mineral laws in 1866.

That for two years there was virtually a vacancy in the land office, and I had to look after the office in order to get my mineral work through.

I have got out or in progress more than 300 patents for mining claims, about one-thirteenth of all taken out in the United States.

The expense to obtain a patent for a mine 1,500 by 600 feet is $300; that includes land, advertising, and all expenses.

I have been over the entire land district and know it.

Would call the entire State of Nevada a mining and grazing State; agriculture is a mere incident; I know the district and State thoroughly.

The State is a succession of mountain ranges running north and south, with valleys in between.

The tall mountains, the Sierra Nevadas, are covered with timber fit for lumber, and the rest of the mountain ranges are covered with small timber, nut-pine, &c., used for fuel; the water-courses are small in number and limited in supply.

The rain and snow fall of the whole State is from 6 to 8 inches.

There has been no change in the rain or snow fall since I have been in this State.

I would classify the lands in Nevada by calling them timber, mineral, arid, and irrigable.

I would let this classification be done by the deputy surveyors in their field-notes and maps.

When townships are surveyed on streams or water-courses; where irrigation is practicable by the lay of the land, the deputy surveyor by instrument should ascertain the altitude, and that altitude should be carried out on all maps in the range of these water-courses; also should show by contour lines or otherwise the slope of the land, whether it could be irrigated or not. This map when returned to the district land office would be the basis for the sale of the lands, whether irrigable or arid.

The rainfall in Nevada commences about September 10 and lasts till May; this includes snows.

No part of the State can be cultivated without irrigation.

Most all the water in the State has been taken up.

The laws of the State and the decisions of the supreme court of the State give the water to the first appropriator to do as he pleases with it; provided he takes it out of the stream and uses it, he can change it from one piece of land to another and he must turn the excess back in the stream.

I have never known a valuable water-right but what there has been a conflict about it, generally costing more than the water is worth.

One acre out of 100 is agricultural by irrigation; 90 acres out of 100 pasturage; and 9 timber; the mineral lands are included in the timber and pasture lands.

A pasture homestead should be allowed on the arid lands for the purpose of raising cattle, say of 3,000 acres.

These arid lands should be surveyed and sold at not exceeding 10 cents an acre, and in unlimited quantities, protecting the present occupants of the ranges with their herds of sheep and cattle.

About thirty to forty acres are required to keep a beef in this land district.

The increase of a herd of a hundred cattle would keep a family.

The grasses in this State are bunch grass (which is the principal pasturage grass) and the white sage, which is made fit for use for the cattle by the frosts.

The grasses on the range have decreased, because the cattle and sheep eat it, roots, stock, seed, and all. This could be obviated if cattle men had the ownership or assured possession of their ranges. They could fence the ranges, either by fence or herders, and thus retain control of the range necessary for their band of cattle and keep interlopers off, and they could move their herds from place to place on the range, and thus secure a succession of grasses, giving it time to seed and reproduce.

Sheep and cattle will not graze on the same lands.

I believe in the retention of the rectangular system of surveys of the public lands, with the addition of, first, more permanency in corners and stakes, as in a long experience as a civil engineer I have frequently been called upon by settlers to rerun old survey lines, so that they could ascertain their lands, and have generally found the

stakes and corners obliterated because of the rotting down of the stakes and the tearing down of the monuments, and even the best deputy surveyor, under the present system of marking the surveys, can't make his work hold more than five years.

The government should provide iron or other metal permanent stakes or posts, say at the intersection of every four townships; and I suggest the improvement of the present system of surveying by the addition of triangulation, so that isolated tracts of settlement or other lands can be reached by the surveys without the great expense, as at present, of surveying the exteriors and subdivisions of many townships.

I suggest that the timber lands of the United States be let alone as they are now—I mean in the State of Nevada—because the amount of timber is so small as against the total area that it would not pay to survey it. When the timber in this district is cut clear off it comes again, but very slowly. The mahogany is one hundred and fifty years getting its maturity. It is a dwarf and does not average over 15 feet in height and about 8 inches in diameter. It is best for fire-wood. The juniper is not fit for charcoal and is only fit for fuel. It gets its maturity in about forty years. It is a scrub, seldom reaching more than 15 or 20 feet. The nut-pine is the most valuable tree of any outside of the timber on the Sierra Nevada, and grows on most of the mountain ranges. It is the most valuable for charcoal, and reaches its maturity at from forty to fifty years, and grows to the height of 20 to 25 feet. Charcoal is an indispensable element in smelting in this State. The forests of the trees above set out, unlike the pine forests of the Sierra Nevadas, grow at wide intervals. On one side of a mountain range you find a forest where the snow lies, say the north side, and then you go six or eight miles on the other side and find none. My observation is that the cutting off of these forests does not affect the rainfall of the State, not an inch. The mountains about the Humboldt which furnish the snow and rain for that stream are bald of timber.

I would place the jurisdiction over the public timber lands in the hands of the United States district land officers, who should be authorized by law to issue license to responsible persons to cut and use timber on the public lands, this for the purpose of protection, and providing that the smaller growth of timber should not be cut. The reason why I do not favor the sale of these timber lands is that every dollar added to the cost of smelting by reason of charges of wood for charcoal adds to the already great cost of smelting our ores of gold, silver, and lead, and would prevent the smelting of a vast amount of ores which are now worked at a very small and close profit. There are no fires of any moment in this district.

Persons just build a brush fence to mark the lines of a land claim for timber. This is respected under the local usages and customs.

I would suggest that it be left to the miners of a locality to adopt, as the formation shall warrant, either a square location with end and side lines or the location permitted under the present act of Congress, which I would reduce to 100 feet on each side of the center of the lode.

No official survey of a lode claim should be filed which overlaps on the surface.

The croppings I understand to be the top or apex of a vein or lode. The top or apex, the course, and angle or direction of the dip cannot be determined in the early workings of a vein or lode.

The intended rights of a discoverer are properly defined and protected by the locating of a claim in many cases under the existing laws, for the reason that if the ledge crops out for the 1,500 feet the miner can mark his monuments so as to give his side lines accurately, and in blind ledges they seldom run for any great distance, and are generally pockets, so he is not much injured by the blind feature.

The ledge on which is the Eureka and Richmond in this mining district is, say, in some places, 700 feet. The local law of this mining district permits the taking of 100 feet on either side of the ledge, so that in this case neither the Eureka nor Richmond would have been injured, because they would have had the whole ledge in width and 100 feet on either side.

I don't think it would be policy to change the present laws in regard to lineal locations of lode claims to fit the few cases where the ledge will cross the side lines and leave the man's ground after he has staked it. When a locator locates a lode claim, allow him to get a patent without the expenditure of $500 for work, for the reason that by the time he has expended his $500, if he has developed a good mine, he has simply opened up a way for jumpers and blackmailers. I have never known a valuable mine but what was burdened with serious and disastrous litigation.

The present mining laws of the United States are very good, and only need a few practicable additions and amendments.

I had experience in forming mining districts in Palmyra and in Washington districts in 1860 and 1863.

In organizing a local mining district the men who are present, sometimes two or twenty as the case may be, and need not be practical miners, hold a meeting, elect a president and secretary, adopt mining laws, setting out the boundaries of the district, elect a recorder and fix his fees. The recorder keeps a book in which is kept the record

of the meetings, which is the basis of the title to width and length of a lode. This book remains in his possession; he is under no bond, and the record could be altered by him at pleasure. The notice which the miner gives the recorder is a copy of the one posted on the claim, and the miner often floats this notice about until he gets what suits him. I have known these records to be altered by the recorders, and in some cases the books lost, burned, and destroyed. I knew this to happen in Belmont and Bullion districts in this State. There is no security against frauds of this kind. In view of all this I believe that all mining-district laws, customs, and records could advantageously be abolished, and the whole initiation of record title as to future locations be placed exclusively with United States district land officers, making provision for convenience of the miners at isolated places a great distance from the office.

The limitation as to possessory title under the mineral laws should not be enacted into a forfeiture; in many cases miners are too poor to pay for their claims and hold their possessory titles by doing work upon them as now provided by law.

I have cases of mining patents pending before the department at Washington for more than nine years. The average time in getting a mineral patent from this State is about three years. If we desire to hurry them by retaining an attorney in Washington and paying a large fee, we can get patents in from thirty to sixty days. This is all wrong; patents should be issued in their turn, and promptly, and no preference given either to attorney or principal.

Testimony of A. D. Rock, surveyor, Eureka, Nev.

1. A. D. Rock, surveyor, Eureka, Nev.
2. Thirteen years.
3. By possession only.
4. Only by observation and surveying
5. No answer.

TIMBER.

1. There is but little, and mostly slow growth—piñon and cedar.
2. None.
3. I would sell in small quantities to citizens by entry, after local surveys.
4. I would not; it would not pay for sectionizing.
5. No growth from old stumps; it would take fifty years.
6. One must have some timber.
7. To settle the country.
8. Is his by right of possession.
9. I think they would, with restrictions; not to incur expense in surveying.

LODE CLAIMS.

The local rules and acts of Congress are sufficient as now found. Supreme court decisions are generally about right, and generally satisfactory.

Testimony of David Van Lennep, surveyor, Winnemucca, Nev.

The questions to which the following answers are given will be found on sheet facing page 1.

Answers to questions submitted by the Public Land Commission.

1. David Van Lennep, Winnemucca, Nev., surveyor and assayer, United States deputy surveyor, Humboldt County county surveyor.
2. Eleven years.
3. Acquired title to public lands of the United States for other parties under the desert-land act.
4. By being in contact with parties acquiring the public land.
5. One difficulty presented in this county (it is very extensive) is the expense and loss of time of going to Winnemucca and Carson to make affidavits before the proper officers; also the necessity generally of employing legal advice to draw papers properly. I do not know of any remedy.
7. The county is cut by mountain ranges, almost all running nearly north and south, between which are valleys from two to ten miles wide, and through the latter the main

water courses flow or make sinks. These courses or rivers are fed partly by springs from the mountains, more largely by rains, but mainly by snow melting on the mountains. On account of the scarcity of water and the necessity of irrigation to obtain any kind of crop only a small portion of the land is agricultural, properly speaking; a larger proportion is pastoral. Grass is abundant on the hills and mountains; also in the bottom lands in ordinary seasons; at present, after two dry seasons, grass is very scarce everywhere; it is best on the mountains. There is also much mineral land, so called; a very small quantity of timber land. The timber is only fit for fuel and farm purposes, such as fences and out-houses; it is not fit for lumber.

8. Land that can be irrigated should be classified *agricultural*, provided the soil is rich and does not contain too much soluble salts, such as common salt, alkali, borax, &c.; *pastoral*, when producing natural grass and brush fit for cattle, provided there is no valuable mineral found thereon, and provided the sale as pastoral would only mean the surface, irrespective of mineral that might be discovered after the sale; *mineral*, to be only such lands as have mineral deposits or ledges bearing valuable minerals; *salines*, having a deposit of alkali, common salt, &c., &c., on the surface; these are considered worthless unless they have enough salts to gather.

9. Agricultural lands to be acquired in such subdivisions and quantities allowed now, with privilege to acquire pastoral lands besides in larger quantities but in same subdivisions now in use, with the option to take land in a different place or away from the agricultural land; *mineral* as at present; *saline* only when the salt is found in large enough quantities to gather, to be taken as placers.

10. By the above suggestions it is believed that more land will be acquired by actual settlers, at the same time making the acquirement of land as simple and economic to settlers as possible; increase the fall of rain and snow to about double the present rate and there will be a demand for land and homestead.

AGRICULTURE.

1. Climate good; rainfall scarce; length of season short, having frost almost every month in the year; snowfall in winter in the valleys moderate; more abundant on the mountains; drifts in the deep ravines, and when heavy gives a good supply of water for irrigation.

2. From April to October rain, or snow that melts away fast, falls in small quantities. The heavy snowfalls are liable to come in December, January, February, or March; best when they come in December and January, as the snow by freezing is more likely to last later as a supply of water for irrigation. The thawing of snow on the mountains comes mostly when needed, but frequently in too great abundance in spring and too little in summer.

7. The general supply comes from snow on the mountains. Melting of snow swells and overflows at times the rivers, such as the Humboldt, Little Humboldt, and Quin's Rivers; also creeks, such as Martin, Cottonwood, Buena Vista, Kayoti, and many others. By the end of August, and sometimes before that date, both rivers and creeks are dry one to four miles after leaving foot-hills; many do not reach the valleys. The Humboldt River is an exception. Springs are found in different localities; each irrigate a very limited amount of land. Most of the little springs in the mountains, in August, September, and October, run only a few yards from their origin.

8. Irrigation is comparatively in its infancy in the county, although settled for about eighteen years. Generally too much water is used and wasted. There is no idea or impression that irrigation impoverishes the land. Much land in this county has given rich crops of grains (cereals), year after year. Manure is not used, except for vegetables, &c. I do not know that crops are raised higher than a thousand to two thousand feet above the valleys. In cañons and small ravines between hills, these places are the warmest, and therefore better fitted for vegetables and fruit trees.

9. Generally all surplus water is wasted, as no care has thus far been taken about economizing it, and if a neighbor does not need the waste water, nobody attends to it. No regulations are in existence in the State or county about the use of water or waste water.

10. Water available for irrigation is all taken up; usually by the laws of the State.

11. The great scarcity of water, occasioned by drought the last two years, has been the cause of several lawsuits, the last and present year, in Paradise Valley, Big Meadows, and Kayoti Creek, near Unionville.

13. Not practicable. A settler wants always a small portion of agricultural land near his house, in a cañon, along a spring, &c., which could not be called pastoral.

14. I think it is to be only partially limited, to prevent speculation on one hand, and on the other to enable settlers to have enough land for their stock.

18. The growth has diminished.

19. Partially, mostly in valleys.

21. Rivers, creeks, and springs, both in valleys and mountains.

23. Has diminished.

24. They do to a certain extent, but sheep destroy the feed and render it unsuitable for cattle.

27. The lack of water for irrigation being the principal cause in the way of increasing the agricultural industry of this county, any means employed to increase water would increase also the sale of land. Whether this could be effected by the inundation of the Colorado Desert, forming an inland sea or lake, and thus increasing the humidity of the atmosphere of this county; or, by a more direct way, by grants of land at a reduced price for every success in bringing water to the surface by artesian wells, would forward that end very greatly. These grants might, to advantage, limit the time. It is probable that success would excite too much speculation.

28. In places much trouble is found, although few are entirely obliterated. This occurrence is in very sandy soil, which drifts by wind. Posts and mounds in the reach of cattle are apt to be destroyed. The cattle scratch themselves on the posts and break them; they also tramp down the mound. At times, in a new and unsettled country like this, ignorant and malicious men do not respect or take care of survey-posts around their own property. Generally, corner posts near an old Indian camp are destroyed; the mound is usually found.

TIMBER.

4. There is no timber land (properly so-called) in this county. On some hills scrubby cedars or junipers; on higher ranges some mountain mahogany—all in limited quantities; in cañons along the creeks, cottonwood, quaking asp, and willows. In the southern part of the county nut-pines, rather small, are found on a range of mountains, hardly good enough for lumber. All the trees above stated are used for firewood and farm purposes as timber.

2. No timber planted. Trees planted about houses and gardens are poplars, cottonwood, locusts, and fruit trees—thus far used more for ornament and shade.

LODE CLAIMS.

1. As superintendent of mines in this county; surveying mine claims for patents, and the interior of mines. Have been called as expert in mine litigations.

2. The mining law, as interpreted by the Commissioner, is complicated and difficult to comply with. It causes great unnecessary expenses in the obtaining of a patent. It should be so amended as to give a clear and simple interpretation. There should be a first and preliminary location when a ledge is first found, to allow time to locate in a permanent manner, after determining the course. The final location should be made by competent persons. It should also require the length of claim to be in the general direction of course of ledge; this to be found by taking a level as near as possible on the course. Locator should have the privilege of locating over 300 feet width from center of ledge in case the same outcrops beyond 300 feet from the center line of ledge. This provision to be only with intention to cover the outcrops by location, and prevent outsiders from taking advantage of the circumstance. The claimants of a claim should have the privilege to act by attorneys in certifying to papers required and necessary in obtaining a patent.

3. I have not had any case of that kind in my practice as surveyor. I should think it better to have such cases decided by courts of justice before filing.

4. The top or apex is the uppermost part of the ledge between the two walls, although these may be missing. Most generally the apex or top can, but the course and dip cannot be determined. Blind ledges are those whose top or apex are under solid ground, and which have not thus far been exposed to the surface.

5. They are not.

6. The law is usually complied with as near as possible with regard to these points. In case of a lawsuit advantage is taken of any weak point.

9. Do not know any wider than 300 feet from center of ledge; they are sometimes wider than district regulations allow. In the latter case the local laws are apt to be modified.

10. This occurs in outcrops of a ledge whose course is across a hill and dipping in the same at a small degree from the horizontal. The outcrops are frequently located and not the course of the ledge. If located by the course the outcrops would be found outside of the parallelogram of location.

11. To the disadvantage.

12. B can put A to cost and inconvenience. I do not know now any case to the point.

13. Such cases are of frequent occurrence. Blackmailing is not confined to the portion of the dip which has passed beyond the exterior lines of the surface tract. It would be too much labor or expense to try to do that with vertical veins.

14. I think it possible and also better than a contrary provision, as the original discoverer, in the last case, may derive but very little benefit from his discovery if his ledge is dipping at a small degree from horizontal, while an outsider, in such a case, would have the lion's share.

16. After a ledge is found, as soon as the discoverer gets an idea of the course, dip, and value of his ledge, say in two or three days (but if an excitement is existing in the district he is apt to locate immediately), he places a notice and monument to start from, and very indefinitely states the course of claim located. A copy of the location he takes to the district recorder, who records it and measures the claim a few days after, according to the laws of the district, placing the corner monuments, as stated by location, as near as he can by a pocket-compass, or, in absence of it, by guesswork. This proceeding is subject to many imperfections, and when the location turns out valuable ground the want of conforming to the laws of the United States creates much trouble, inconvenience, blackmailing, and resulting in very serious litigations, and not unfrequently the loss of the claim to the original discoverer.

17. It cannot be amended, if other claims have been located along the same, except by consent of subsequent locators.

19. I think, with precautionary measures, mining district laws could be advantageously abolished as to future locations, provided the United States land offices for mining claims be placed in more centers than at present for public lands.

22. Ought to be limitation—say five or six years.

PLACER CLAIMS.

1. Small gulch placer claims exist in this county; thus far no effort has been made to procure title for them.

Testimony of B. C. Whitman, of Virginia City, Nev.

B. C. WHITMAN, of Virginia City, Nev., testified at San Francisco, Cal., October 11, 1879, as follows:

I have been familiar with the mining laws of the United States for fifteen years as an attorney, confining my business almost entirely to the mining corporations. I think the present mode of initiating titles with the mining recorders is probably satisfactory, but the method that is primarily used in mining districts is very uncertain and unreliable. At the present time mining records are of record in the county recorder's office, and are just like any other titles. I speak of Nevada only, as I do not know anything about any other State. The original notices are drawn by ignorant prospectors, and frequently by persons who find it somewhat difficult to write the English language, and indefiniteness of description arises on account of their ignorance. At the present time we are acting under no especial mining district laws, but the mining notices are filed as prescribed by the laws of the United States, and are filed in the county recorders' offices and there recorded. The original locations of the Comstock were filed in separate mining districts; one in Gold Hill, and another in another place. All these notices have been transcribed, and the originals have been held in the office of the county recorders. These were originally drawn by the claimants themselves, with a great indefiniteness of description and date. You would see "recorded this day," and there would be no date. It was posted on the claim and filed with the local mining recorder. There was no security for the integrity of the records in the hands of the mining recorder. Those records will show the very great carelessness with which the business was done. For instance, in the notice of the Miller grant, as it is called, at least one-third of the names that were originally written upon the notice have been scratched out and other names substituted; properly enough, because the names of most of his friends were written there, and as those friends did not come to time he would scratch out their names and insert others. He used the names of his friends to take up a number of additional feet.

The Miller claim as originally located was 3,600 feet. The district law then allowed 300 feet for each locator, and it in terms restricted a man to about so much, but in fact a man located as many feet as he pleased by using the names of other parties, and often without their previous knowledge, and then he would go to them and have them deed to him what he had located for them. Locations are often made in that way, and then deeds taken by the original locator from the others. Locations are now ordinarily made in the name of one person, because he can now take 1,500 feet.

The county recorder is under the same responsibility for copying mining titles as he is for copying all other records. He is elected by the people and gives bonds to the State, and is the custodian of the records of the county. A certified copy of his record is the basis of title. If he sends a false certificate he could be punished under the statutory law for falsifying his records, because it is under the State law that he is made the custodian of those records. The mining law allows this notice to be recorded, and if an error, intentional or otherwise, were committed in the certified copy, I do not know whether that would make him amenable under State law or not. I think the initiation of the law ought to be in the United States in the first

instance. As long as they keep control of this land they should have control and disposition of it from the beginning to the end.

The present system is anomalous and burdensome. The location and size of the claim should be regulated by the United States. If the United States has supreme control, it should either exercise it or give up the control of the land. I think it advisable to require a miner to commence with an official survey wherever it can be done. I think the law ought to prescribe that the survey should be made within a certain time after the location has been made. I do not think it would be burdensome, because the surveyor generally accompanies the prospector or follows closely after him. He follows there for custom. It is seldom, if ever, the case that a man cannot have his claim surveyed within thirty days after his discovery. The difficulties would be obviated by allowing him, in proper form, to locate his claim upon the surface and posting his notice thereon, and then allow him to file his notice with the surveyor, permitting him to ask for a survey, and that survey dating from the date of his application. I think sixty days at the outside would be sufficient time in which to have him apply for a survey. My personal opinion is that no surveyor ought to be allowed to make a survey over an overlapping claim. It is not infrequently the case that a claim which has been located, so far as you can gather from the notice of the discovery, and so far as you can gather from the oral proof, runs in a northerly or southerly direction, but when the United States surveyor is called upon to locate it the claim has swung around into an easterly and westerly direction.

It is very difficult to see the true direction of a claim, because parol testimony is becoming extinct in old mining districts. It is very expensive, too, for witnesses know their importance and charge very high fees for testifying.

There is a great deal of trouble arising from claims being swung around and their direction changed, and the only way of overcoming it is by the original location and the testimony of the work which the parties have done.

Parol proof in a mining camp is not very difficult to obtain. The witnesses in our district would stand very favorably, because they have testified often, and we can tell pretty well whether they are telling the truth or not.

Question. Do you think it well to require the discovery of a lode before location is admitted?—Answer. No, sir; I do not understand the object of such a provision of law. Sometimes valuable mines after they have been found are blind lodes. Croppings on the surface of a country are false indications in the value of lodes. There are many transformations which affect the croppings, but do not affect the ledge underneath. I think if a man has made his location and is willing to go on and work it, that he should be entitled to whatever is within his lines. I think the government should provide a different style of location from what they have now. My theory is that a better system of location should be adopted for every mining region, but I know nothing about the expense that would attend it. The Comstock is a square location, with vertical side lines. The advantages of that location would be, in the first place, to prevent a great deal of litigation that follows when two or more ledges unite, and there is no division of them afterward. Nearly all our mining litigation arises from this cause, and experts are very apt to take sanguine views of the ledges of their respective patrons. They become interested in the case, and I have known jurors to decide upon a case where the ledge was no thicker than a knife blade. I have also known them to reject where the lode was very thick. The Comstock ledge is now looked upon as the centering of deposits from all the croppings from a mile around.

Q. Is not a certain line of claims recognized as being the Comstock lode, and is there not in front of those recognized as being on the lode a multiplicity of other locations?—A. Yes, sir; and the result is that parties having no lodes on their own grounds strike the dip of those other lodes, and set up adverse claims. It is possible under the present law when a man has located a valuable lode for any other party to sink merely for the purpose of striking the dip of that lode. In such a case as that difficulties must necessarily occur. There is that kind of trouble now in the Comstock district. The Chollar Potosi had the Custer location; the Julia has the patent for its grant, and has extensive works. The land office refused to entertain a protest of the Chollar Company, saying so far as could be ascertained the Julia lode was a distinct body of ore; but if the Chollar Company ever in their workings proved the connection between the two lodes, then it would pass to the Chollar and its location, so that if it is proved to be the Custer lode, the Julia patent would be voided. In our State courts such cases are frequently passed upon by experts; in some form or other by the testimony of experts as to the theory of location or otherwise. They must satisfy the jury of the connection between those two locations. It is only a question between a practical location and a theoretical location.

Q. What size would you have a square location?—A. I think the square location should be 1,500 feet square; that would be a fair allowance. They give now 1,500 feet in length, with a surface ground of 300 feet on each side of the lode. I think if they give a man 1,500 feet square he will have a mine if there are any mines in the district; but I would have all local laws conform to United States laws. There should

be no interference between the two. I think the square location would have no injurious effect upon deep mining; on the contrary, I think it would improve it, have a good effect, always provided that the United States survey and fix the monuments. A man could go in there then feeling that he owned that piece of ground, and I think every prospector would be willing to avail himself of that and go to work on that supposition. The history so far as I know of every mine and mining company is continued litigation and expense by adverse locations. With a square location there could be no litigation. Mining men would be more willing to invest in a square location than they would in what we call ledge locations.

Q. Would parties be willing to develop the mines, with a possibility of getting outside of their location?—A. I think parties would undertake to mine with the possibility of working outside their lodes. They would at least have a right to the ore deposit as it is, any way. I have no fixed opinion about the size of a mine; it might be made larger. Of course I understand that that system of square location would not be satisfactory for a ledge like the Comstock lode, or a lode of that width; but it is impossible to have a sliding scale of location. You must have some absolute rule, and I am inclined to think that an absolute rule of square location would be more satisfactory than any other. The locators on the Comstock lode have been obliged to litigate, and they will have to go on litigating. That was the great question in the celebrated Eureka case. They claimed that they were on a great lode, and, anywhere within the end lines, had a right to follow that lode. They defined the mining word "lode," accepting the miners' idea of it. There were several patents in that case, and they didn't settle anything at all. The patent for the square location settles something absolutely. In the event of the square location being made, my idea is that a party shall have from the surface down to the nethermost depths. If he finds a deposit of ore he is fortunate; if he does not find it he is in bad luck; but he should not go outside of his lines. Within his end and side lines he is entitled to everything. Each man would then understand just what he has got. Of course there would be a great deal of digging around underneath, but that would be simply a matter of trespassing. I would allow another party to locate on the next claim, and to go down to any depth to find a dip of the ore if he wanted to. I am not a practical miner, but I have talked with many men who are, and that is their idea about it.

In mining districts you frequently will find small lodes running parallel to each other, and I think a man should have everything he finds inside his location. They take the whole district now in Bodie. There are supposed to be half a dozen lodes. No one of these lodes is wide enough to warrant anybody in exploring it. Then from the dip of these lodes it appears that some of them may combine, so that they have been obliged, in order to protect themselves, to locate half a dozen lodes for the purpose of getting one mine, and, as they are distinct ledges and one man located them, this causes confusion of title. There was a case in one of the Nevada districts where they had located two or three different claims. An adverse location having been made there, that matter came up for decision and a very important question arose: whether the work done upon one of these claims applied to all of them; the court holding that it did, because it was all taken up to make one mine. The adverse claimants argued that one of these locations had been abandoned, because the legal amount of work had not been done upon it. It seems to me if the square location had been applied to the Comstock lode it would have been better. In the event of the square-location system being adopted, you would have to repeal the tunnel law. I do not see but that, under the present law, when a party locates a tunnel another party has a perfect right to go and locate a claim of 1,500 feet over the tunnel, but before the tunnel discovers anything; and I understand the rule of the Land Office to be this—that the party running the tunnel is entitled to locate 1,500 feet upon any ledge that he may discover in his developing, but the width of the location shall not exceed that of his tunnel, if nobody subsequent to his location gets outside of the lines of his tunnel and makes a previous discovery of a "blind lode."

Q. You say that they may make a previous discovery; that is, make this discovery on the surface before he has made one underneath?—A. What I mean is this: A starts a tunnel; that tunnel is ten feet wide, and he is prosecuting work on the tunnel. B comes here and sinks a shaft and finds a lode and locates it, and A strikes the same lode in his development; then B takes the lode. As most of the tunnels are very expensive, that renders the tunnel law practically ineffective for the purpose of prospecting. There are a great many instances of this at Bodie. I have never known anybody to discover anything, except in one or two cases where they claim to have discovered lodes by means of tunnels; I never knew any lodes actually worked that were discovered by tunnels except in those instances at Bodie. The tunnelers claim to have discovered a valuable lode to which there is no outcrop and upon which they have located a claim of fifteen hundred feet, to which they are entitled. In regard to the two or three other so-called discoveries, there is more or less litigation. In the event of the square location there would be no necessity for the tunnels; the square location is supposed to give a man just what there is in his claim, and nobody would be allowed to go in

on him. I think the tunnel law has been an advantageous law in California for the purpose of discovering old river-beds, but if a person had a square location he would have a right to run a tunnel in that, if that were the easiest way to get to his ore, if he did not interfere with anybody else's rights. There would be no need for the tunnel law to enable him to take up a mineral claim.

Q. Suppose the law provided for square location and the title initiated in the form you have indicated, would you require the proving up on the title within a certain length of time?—A. I think the limit of time within which to prove up should be increased, and I think the party should be compelled to get the title from the government, and all merely possessory titles should be extinguished. One year, I should think, is sufficient time for proving up, and at the expiration of that time a man should be merely required to establish that he had made his location in accordance with the provisions of the statute, and that he had done the work upon the claim as required by law. Under the present law there is no proving other than the location of the party and certificate of the deputy surveyor; and while these gentlemen are generally very accurate about it, of course there are cases where they are mistaken.

Q. Would you have the law specify what the character of the improvements should be?—A. I think not, sir, except that the character of the improvements should be actual work or actual expenditure conducing to the development of the mine. I believe that the courts have decided that buying machinery is an expenditure, and I do not see why that should not be accepted as such.

All over this country claims have been abandoned absolutely and nothing done upon them for years. Eventually some enterprising person comes in and makes some discovery, and then the old locator comes back, and they can almost always succeed in getting a case sufficiently strong to bring about a compromise. Now, if a party is compelled within one year to make his application for title, and a strict forfeiture is provided for non-compliance with the law, it would do more to improve the country than anything else. That forfeiture should be merely a cancellation of all rights, and abandonment should be conclusive proof. The law should provide for the extinguishment of possessory rights of all parties to the land. The old possessory claims should be placed upon the same footing, so that in course of time there would be some common law in operation.

I think the mill-site privilege should be continued, because the square location might not be a very convenient location for the mill-site. I do not think that there is any necessity for a party to make proof that he has got a mill or intends putting up one. Let him make his application, and then the government might agree to give him an absolute title upon proof that he had commenced and progressed to a certain extent with the work.

I do not know that any mill-sites have been taken up for the timber or other values to be obtained from them; that is, from the land. All the saw-mill sites I have known to be taken up have been for actual use. I do not think there is any necessity for a law restricting the distance of mill-sites from the mines. It might depend upon many contingencies as to where the mill-sites should be put. For mines that are down on the Carson River they used a mill down on the Washoe; it must have been 50 miles from the mill to the mine in that day. Of course no man is going to claim a mill in any district that is practically too far off from his mine. In Eastern Nevada there are places where they haul 30 or 40 miles to the mill, and it has always been a question whether it was cheaper to haul ore to the mill or water to the mine.

Q. In the event of mill-sites being continued, should the restriction of the non-mineral land be continued?—A. That is a question which requires a good deal of thought. I should be inclined to think that there is no necessity for any of those provisions in regard to the classes of mineral or non-mineral land. Practically, if the simple provision that is placed upon each patent is carried out, I think surface locations need not conflict with mining locations. There is a great deal of surface land that is in neither class, since part of it is mineral and part non-mineral land. It should be used for surface purposes. I do not see any particular reason for drawing a distinction between mineral and non-mineral in districting. There have been a few instances where mines have interfered with the possession of the surface. There was one in the case of the Chollar mine. Their location was prior to the location made by parties on the surface, and the mine coming up near the surface, the occupant of the land was ordered to move; but he did not do so, and his store dropped down into the depths one night. This is the only case I have known where the rights conflicted.

Q. Would you reserve the subterranean rights?—A. The sale of one thing should not include another; the sale of the surface should not include subterranean rights. I think if a man bought the timber land, and if he wanted to make a mineral location, he ought to be compelled to make another location. As the case stands, I see no reason why the two should go together; why the surface rights and subterranean rights should not be sold separately.

Q. Should not the publication of the objection provided by law to the mineral application be conclusive upon the government as to the right of the applicant?—A.

The present system is exceedingly onerous to the applicant. In the first place, they require an abstract of title; that costs sometimes thousands of dollars to obtain, besides taking a great deal of unnecessary time. That abstract of title may, under the present system of the Land Office, be of some use, but there are other cases where it is not of any use; that is, in the case of contested patents; he has to furnish an abstract of title that can never be of any use, and after this abstract is furnished the office frequently refers the whole thing to the State courts, and the State courts decide upon the title between the two. The proof must be made over again. This lies in the archives of the Land Office, and I cannot see that it is of any use. In many cases it is absolutely impossible to get an abstract. In early days they made that transfer by putting a party in place on the ground. The courts have held that to be as good a title as if a man had a paper title. It is frequently the case that when abstracts come up they are necessarily incomplete, because it is impossible to make them complete, and it seems to me that the application is always necessarily between the Government of the United States and the applicant, and it should be conclusive as to the intention of the applicant. He is obliged to go into the State court, and the judgment of that court is conclusive in the Land Office. The Land Office looks into it in the first place merely to see that it is a *prima-facie* case.

Q. How would such a provision as that of section 15 of the act of March 3, 1851, do?—A. I think some provision of that kind would be effective.

Q. Do you think that it would be wise to invest the executive officers with a larger jurisdiction as to the *prima-facie* validity of the adverse claim than they now enjoy?—A. A man makes an objection under oath, and I think that is enough. I am inclined to think that is as well as we could have it. He makes his objection under oath, and he has to file his abstract of title with his objection. I do not see any reason for filing that abstract of title. My idea is that if he makes his proper sworn averment that should be sufficient, in view of the fact that he has, after a certain time, to prosecute that averment. If he does not prosecute that averment with reasonable diligence, I think this matter should be left with the courts where the case is tried. I think it is right to leave it there for the action of the court if it is not prosecuted with reasonable diligence, and I do not think any other person ought to be allowed to interfere with it. It is hard to say what reasonable diligence is, and the court is the proper tribunal to decide it.

Q. In your judgment, should the conveying of mineral transfers be with the executive officers the same as with all other land cases?—A. I cannot see any reason for making a distinction. I never could understand why they should inject this question of courts into a proceeding which after all does not involve any questions of law, and which is an administrative proceeding. They are simply questions of facts, to which there can be very little objection under proper statutes. Taking them up to a court tends to additional expense and delay without producing any good or economical results. The question comes up about location, and one court will hold parties to a strict compliance with the statutes, while another court will hold that anything which indicates the desire of the party to make a location is substantial compliance. If these matters were before the Land Office, there would be a ruling, and there could not be a very great conflict of opinion, because it ultimately comes before the supreme power of the Land Office. I think it would be a much better system and a saving of expense to have the whole question from the inception of title to the end go directly through the Land Office, as all other land cases do, and that the patent, when issued, should be conclusive upon the question of fact. Of course, it would also cover many questions of law. The patent should show that the applicant had done everything he was required to do in order to get a patent title from the United States.

There is another thing; it has been decided by the Commissioner of the General Land Office that under the present statute a man may make more than one location upon the same lode. It was decided in reference to the iron mines of Colorado. That decision has been made, but whether it is to be a decision without contest I do not know; but it seems to me that if that statute is altered, it should exclude the party from making more than one location upon a lode. It may be that this is a proper decision under the present language of the statute, and I think that result ought to be prevented by putting in an enactive word. I would give a party but one right of pre-emption in mining cases, the same as is now done in agricultural land cases. The government gives a party a certain right, and it does not intend that he should hog everything. My recollection is that that decision was made four years ago. The decision goes on to say that the statutes of the United States do not prohibit a person from making more than one location upon the same lode; therefore, if it does not prohibit him from making more than one, he may make fifty if he may make more than one.

Q. Do you not think that a more perfect system of surveying of mineral claims could be adopted?—A. I cannot answer that; I am not sufficiently a practical surveyor.

Q. Does the present system lead to great uncertainty?—A. It would ultimately, but it does not now because live witnesses are at hand. I think it would be well if the

mines could be located with absolute certainty. Frequently the second owner cannot find the corners, even if he went to the surveyor who first laid out the ground; and the chances are that the present surveyor would miss it a little, and in case of controversy it would cause trouble.

Q. Suppose that a party takes up a square location with a dip running off in a certain direction, and then that dip turns and runs out the other way; what would be the situation?—A. The situation would be pretty bad, but I do not think it would be any worse than the situation is now. I think the individual miner and prospector would be safer. He might occasionally lose his lode, but I think the individual loss would be overbalanced by the public gain.

I have a proposition I want to suggest. In the State of Nevada I know, as a matter of fact, that parties have necessarily, not through any fraudulent intent, cut timber upon the lands of the United States. I presume there are a great many instances where it has been fraudulently done, but you cannot distinguish between the two. I think it would be no more than fair to provide that where lands have been denuded of their timber (in the States of California and Nevada at any rate) that if the parties who had committed the act, either by themselves or by their agents, should come forward within a reasonable length of time and pay $2.50 per acre, as a matter of indemnification, they should be released from any action; but they do not want, of course, to be liable to subsequent action for the recovery of damages. It seems to me it would be very well to have the statute perfectly clear upon that subject. It would give parties a right to clear themselves from any criminal and civil proceedings by paying to the United States what it asked in the first place.

In Nevada the wood was not cut for export, but for actual necessities in carrying on the business of the country. It has been burned in furnaces, and a great deal of it is under ground. It has been used for the purpose of development and improvement. If a man cut and sold it and made something out of it, and if he now paid the government all that he would have been required to pay in the first instance, I think the government has got all it could ask. Under the rulings of the Attorney-General, after a party comes forward and pays $2.50 per acre, this is simply a payment of the penalty, and the government is entirely at liberty to follow the lumber and take it wherever it can be found. I understand, further, that they claim the right to sue, in addition, for damages. I do not know, then, what the payment of this $2.50 is for. I do not think the Attorney-General very clearly understands what it is for, either.

Q. Would it not be better, instead, to make a law whereby these parties could procure this timber either with or without sale, and without committing trespass?—A. Undoubtedly. There are many cases where the trespasses have been necessarily committed from time to time. For instance, the State owns certain lands; application is made, and the State authorities say we cannot sell the land because they have not been surveyed, and they cannot be taken up; or the party goes over to another tract of land. Many of these trespasses have been committed by agents without any understanding on the part of the principals. The agent is put upon the proper piece of land and told to cut on that land; and all at once it is discovered that he is cutting timber upon another piece of land. His employer finds it out, and it is claimed that he can be held responsible for it, and I presume he can. I refer to past trespasses. The parties ought to have the privilege of offering to pay $2.50 per acre for stumpage, and all criminal proceedings stopped. If that was a fair price originally it should be a fair price now.

Testimony of Harvey Carpenter, receiver, and James McMartin, register, United States land office, Eureka, Nev.

EUREKA, NEV., *November* 3, 1879.

HARVEY CARPENTER, receiver, and JAMES MCMARTIN, register, made the following statement:

Papers in the land office should be reduced in number; all fees should be abolished, and registers and receivers should be salaried.

Eureka is a mineral district. All mineral district recorders should be abolished and claims filed in the United States district land office. All mining contests should be tried before the United States district land officers.

Registers should have a seal, and should be authorized to subpœna witnesses to testify in land matters; as it is now many rights are lost because witnesses refuse to testify. Registers should also be authorized to perpetuate testimony. There should be a provision of law that settlers in final entries should be permitted to make their final proof, on forms, before a district or county judge.

This district is enormous; embracing the counties of Lincoln, Nye, White Pine, Eureka, Elko, Lander, and part of Humboldt. It traverses the entire length of the

State and is 200 miles wide, so that settlers, either in contests or in making final proofs, bringing witnesses from extreme ends of the district are compelled to go to greater expense than the lands cost in the land office. This is a great evil; registers and receivers should be authorized, when proof has been taken in contests, or abandonments of homesteads or declaratory statements, to at once, upon the reporting of such cases to Washington, admit filings for legal settlers. While the report is pending at Washington, which is frequently a year, troubles inveigh, and fights take place over the land.

I see no reason why a person should not be permitted to file as many declaratory statements or homestead applications as he likes, as there is nothing in the present law to prevent it. It is only a ruling. Every time a person files a declaratory statement or homestead on a piece of land the value of it is thereby enhanced, and an incoming settler gets the benefit of his improvements. It takes entirely too long at present to get a patent, and registers and receivers should have more authority.

We believe in the rectangular system of surveys, as all understand it. Settlers complain of the absence of stakes; they rot and are torn down, and the mounds and pits become obliterated. Stakes are frequently moved by settlers for illegal purposes. In a cattle country like this cattle rub against the stakes and paw the mounds down. The settlers in many cases have to hire surveyors and go to great expense to find the boundaries of their land. There should be some permanent system of monuments established, say at the corners of townships. It is almost impossible after five years to find a stake or mound. Triangulation to such isolated tracts of farming lands could be introduced to great advantage.

There is some agricultural land in this district—say one acre to a hundred—and there irrigation is necessary. The water in the district, which proceeds from springs, streams, and snow, is all taken up either by cattle or irrigation. In this district it is all pasturage land except this bit of agricultural.

It takes from 30 to 40 acres of land to sustain a beef. This district is overstocked, and the grasses are diminishing.

We believe in a pastoral homestead, say of 3,000 acres, on the arid lands of the district, leaving the present settlement laws in effect on lands which can be irrigated. Our water-right laws are under State law, and decisions of our district court give the first right to use of the water to the first locator, to do as he pleases with it. This gives him control of all the lands for agricultural purposes in his section.

No laws affecting the arid lands, either their sale or disposition, should be passed which will interfere with or injure present herds of cattle and sheep in this section. The actual occupants at present on the ranges by local custom should be permitted to permanently occupy them, either by purchase or permit from the United States Government, and be protected in their right to them. These lands should be surveyed and preserved for cattle ranges.

We think the best interests of the government and occupant would be subserved by the survey and sale of these arid pasturage lands. They should be sold in quantities on the basis of thirty acres to sustain a beef, and first to the present occupants of land, who could establish by oath before the register and receiver the number of cattle and sheep held by them at the date of the passage of the act. We think 10 cents per acre ample for them. Five sheep count as against one beef for grazing. One hundred cattle would sustain a family.

There are many contentions between sheep and cattle men about sheep going on cattle lands, they claiming that cattle will not graze on the lands grazed on by sheep. The government should at once settle all these matters as to the sale of lands, &c., for the sake of peace and quietness and to prevent further trouble. There have already been some men killed, others wounded, in controversies growing out of the sheep and cattle question. Giving each stockman the right to a specific range would do away with all this trouble. There is no lumber timber in this district properly speaking, what there is being only fit for fuel and charcoal and mining purposes. No timber has been planted here. The entire control of the timber lands of the United States should be put in the hands of the United States district land officers. In this district any person who wants the timber takes it. A man will go into the timber, build a fence around a large quantity, perhaps miles square, and by local law such an inclosure holds it. They post a notice upon it and record the claim in the county recorder's office. The timber that yet remains should be surveyed and sold to any applicant in unlimited quantities. The charcoal made from this scrub timber is indispensable for smelting. It is generally made by Italians and Swiss. There are estimated to be 3,000 Swiss and Italians engaged in this business within a radius of 40 miles of this town. They cut all the timber clean. The government should sell the timber free from the land. Prosecution for timber depredations as laws are now is impossible. The timber is mostly composed of very small nut-pine, piñon, and juniper, and is of no value for building purposes.

There should be some improvement in the description made by deputy surveyors of the topography of the country, and they should be required to take altitudes. Much land is now marked non-mineral which is mineral, and *vice versa*.

The present notice of intention to prove up is vexatious and useless and should be discontinued. The requiring of thirty days' publication has worked great pecuniary loss to settlers and prevents no fraud. Men who file on mining claims should be required to prove up and get title in one or two years at the furthest.

We have but 6 to 8 inches rain and snow fall in this entire district.

The desert-land act permits location on unsurveyed lands. The settlers should be compelled to give more accurate descriptions than now of their claims, so as to prevent them from moving around on the land.

We consider this a mineral and grazing State. Agriculture is only possible by reclamation of the land through irrigation. Where there is no water there can be no agriculture, and the land is already irrigated to the full capacity of the water supply. Our people utilize their water with great care. Reservoirs are practically useless because of the great evaporation, which is about one inch a day.

In contests for declaring vacant lands under the pre-emption and homestead laws, the person who brings the contest and has to pay for it should, being a legal settler and occupying the land, be protected by the government and have the first opportunity to get the land when it is restored to settlement. This is not the rule now.

Testimony of E. S. Clark, surveyor-general of Nevada.

E. S. CLARK, surveyor-general of Nevada, testified as follows:

I have been surveyor-general of the State for ten years. I am in favor of the retention of the present system of rectangular surveys of the lands of the United States. The system is well known to every settler, and they can find, with ease, the location of their lands.

Some system of permanent monuments should be established by the government at the intersection of townships. The wooden stakes are destroyed, some are burnt for fire-wood, and others rot away. Where cattle run over them neither mounds nor stakes last.

The deputy surveyors do not get enough pay for their work at present; the old prices of four years ago should be restored, as fair pay gets good work. I think there should be an inspection of surveys under contract, to be paid for by the government. I favor the retention of the contract system for convenience; a paid corps of surveyors would be a great expense. All my deputies use the solar compass. I think a great improvement could be made in the method of the description of the lands by deputy surveyors (in fact, a classification of the lands, taking the height of streams as the level of possible irrigation, by following the stream in the several townships and giving its elevation) by the government furnishing aneroid barometers or other instruments to ascertain elevations. It would not add much labor to the work of the deputy and would be a guide for the district land officers in the disposition of public lands. We do not survey anything but arable lands, and there is a great deal yet unsurveyed. The fees in mineral surveys are not, in my judgment, too high. Here we charge $30 for office work.

The timber land should be surveyed and sold. I would sell it in unlimited quantities. Private ownership would be the best protection for the timber. A homestead or pre-emption filing should not be allowed on the timber lands of the Sierras, as men will cut the timber and then abandon it; these lands should be graded in price according to the quality of the timber.

The United States district land office should be given jurisdiction over, and control of, the timber lands for the purpose of uniformity.

I think applications for location of mining claims should be filed in the United States district land office, and all local mining districts abolished. I think mining claimants should be compelled to pay up for the lands and get title.

I would not survey or molest in any way the arid lands of the State. I would let them be used in common by herds of sheep and cattle, under a system of comity as now established among themselves.

I call this State a mining and grazing State. Agriculture, solely by irrigation, is an incident. We have grass on the high lands—generally bunch-grass; in the large valley, white sage; all good for cattle, who don't touch it until the frost comes and sweetens it; then the farmer calls it winter food. The water privileges in this State are pretty nearly all taken up. Parties make application to this office for survey of their claims; the surveys are ordered and are made; the papers are filed in this office on return and approved; some are here that were made four or five years ago. Some law should be passed or rule made forcing these people to make appearance in a reasonable time to the district officers and make payment for their claims.

There should be a law passed prohibiting a surveyor-general from ordering a deputy

surveyor, on application of a claimant, to make a duplicate survey of the same mineral ground when it has once been abandoned.

In this State when a mineral claim overlaps another previously surveyed, the deputy surveyor in his field-notes excludes the surplus ground, and the conflict is shown by metes and bounds the same as a regular survey.

Our incidental expenses of this office are very large and irregular; we should have $3,000 per year for incidentals; we used to have, four years ago, $4,000. The salaries of this office are too low; they should be increased to the same as the California office, as living is twice as high here as in California.

I think fees should be abolished in all matters between the public and the lands and fixed salaries be paid the officers.

Testimony of Capt. T. C. Ford, Virginia City, Nev.

VIRGINIA CITY, NEV., *November* 1, 1879.

Capt. T. C. FORD, collector of internal revenue, testified as follows:

I have been connected with the Internal Revenue Department for eleven years, and know the State of Nevada pretty well. I consider this State a mining camp and a mining and grazing State. Agriculture is a mere incident here, and then only with irrigation. I do not favor any survey and disposition of the arid lands of this State for the next twenty years, because the lands would fall into the hands of monopolists. In my opinion it is impossible to segregate the arid from the irrigable lands. I hear of no trouble nor agitation on this point among our cattle and sheep men.

I would survey and sell the timber lands. The government should get as much for the timber lands as private persons and corporations. I would not limit the quantity that should be sold to an individual.

Testimony of I. E. James, Virginia City, Nev.

I. E. JAMES, civil and mining engineer, of Virginia City, made the following statement:

Have been twenty years on the Comstock Lode, and have done most all the underground work on the Comstock up to two years ago. The present United States mining law is a pretty good law, except that parties have been permitted to locate non-mineral lands as mining land, to the detriment of actual miners. No person should be permitted to locate a claim unless they have mineral. Exploration should be free and permitted on all mineral lands, but no location should be allowed without a party having struck mineral in the place. Under the present law a man may locate a claim 600 by 1,500 feet and hold it against a person who is actually in use of it. Frequently men are compelled to locate mining grounds around their shafts, knowing them not to be mineral, and hold them by doing the work required by law—$100 per annum—so as to keep them from being located by other parties. At Yellow Jacket shaft, which is 2,500 feet east of the apex of the Jacket ledge, the company were compelled to buy at a high price a mining location which should never have been permitted to have been made, because there was no mineral upon it, and, to get ground enough for their dump and works, were compelled to purchase another claim, on which claim the company are compelled to do $100 worth of work per annum to hold it. Otherwise it would be relocated for no other purpose but to extort money (blackmail) from the company; so no location of a mining lode should be allowed except where mineral is in place. The same thing occurred at the east shaft of the Overman, and cost the company a great deal of money. A good mine results in blackmailing suits and jumpers.

I think all mining claims should be recorded in the United States district land office for safety for title, provided convenience be made for miners at a distance, at present on record in the county recorder's office, where the title is kept.

The time required now to get mineral patents is too long. There have been delays in mining patents before the department uncalled for. I know of the case of a man who made application for a patent to the department. The papers were duly forwarded by the local officers some four years ago. In answer to several letters to the care of the Land Office he received a note from an attorney at Washington saying that if he would send a certain sum of money to him he would get his patent. He refused, and when Schurz came in he wrote him, and soon got the patent.

A man should not be compelled to pay up in a given time for his mining claim. In many cases men are too poor to get a patent for their mining lands.

The proposition for the location of mineral claims in squares I have not considered.

I think the timber lands adjacent to the mines should be sold in unlimited quantities and the price graded. Timber should be sold separate from the land. There is some destruction of timber by fires, but a small amount, however. Men who own the timber lands are very careful of them. It is absolutely impossible to mine without timber. The timber lands of the United States should be placed under the control of the United States district land officers. If the timber lands are not sold, persons should be licensed to cut it by the district officers. Lands which are known here as timber lands are taken solely for the timber. The land in some cases contains mineral, and is valuable to the government for mineral purposes.

The tunnel act of the United States is very absurd, and the law, as interpreted by the Land Office and in California courts, means simply a right to the width of the face of the tunnel. The law is of but little use as it now is.

When I first came on the Comstock, in 1860, wood was $16 per cord. Lumber, square timber and all, was $23 to $25 per thousand. This was after the mills were built. The railroads and flumes since then reduced cord-wood to $10.50 and timber and lumber $17.50 delivered.

The mining law now requires that a man shall maintain conspicuous monuments at the corners of his claim. This is now sufficient.

There is no definite width to the Comstock lode; you may say it is from 300 to 700 feet wide. The foot-wall of the Comstock lode is well defined. The true hanging wall is broken and is not well defined.

In regard to locations of mines the law requires that the ends of all locations shall be parallel. This is well enough, except where two adjoining claims may be located with diverging or converging lines. In case the lines are divergent, the law does not admit of the location of the gore between the diverging lines. In case of the converging lines following the dip of the vein, the government having issued a patent to each claim, a conflict would arise where the two converging lines crossed. The law should be changed so as to allow of a location without parallel end lines, so that in cases where there was not 1,500 feet in the locations, and the lines diverged in following the dip of the vein at a point where they became 1,500 feet apart, then they should be made parallel. There are claims on this lead where, in course of time, conflicts will probably grow out of lines crossing.

Testimony of John Skae and F. A. Trittle, at Virginia City, Nev.

JOHN SKAE, mine owner and manager, testified at Virginia City as follows:

The mining law is good enough as it is, but parties have obtained many fraudulent patents under it. I think the local mining districts should be abolished, and all claims be recorded in the United States district land office.

There is a great deal of expense and trouble at present in getting patent title. In the case of the Sierra Nevada, the company I am president of, we were offered patent for our mine for $5,000 by an employé of government. The other adverse parties paid $5,000 for a patent (the Union) and took therein 300 feet of our grounds. We started to litigate, but compromised sooner than be at the expense of contesting the matter. I have been on the Comstock lode since 1859. A square location without conditions of protection to mine owners and actual miners is unfit for the Comstock lode. An actual square location would stop mining here at once.

F. A. TRITTLE, banker at Virginia City, heard the above statement and confirmed the same:

I have been all over the State, and consider it a mining and grazing State. All agricultural land would have to be irrigated, and it is a mere incident. I would not sell the arid lands, as no man could pay taxes on such land and make a living. The government lands should be examined by government officers and classified, and arid lands put aside for grazing. It would be a good plan on the part of the general government to give these arid lands to the different States, because the State authorities know best what to do with them. The general government should set aside in this State enough lands to be sold to establish a permanent school of mines on the Comstock lode. The government should also give the State an allowance of lien lands in place of 16th and 36th sections for school purposes.

Testimony of B. F. White, Beaver Cañon, Idaho.

B. F. WHITE testified at Beaver Cañon, Idaho, October 7:

I have lived in Malad City twelve years. I was its recorder and treasurer for a long time. Idaho is hardly an agricultural country. About 1 acre out of 75 could be cultivated. The timber is all confined to the mountains. About one acre in a thousand is timber; it is mostly arid pasture land. In this county taking the entire area, it would take 100 acres to keep a beef. The grass is very scant and poor. Sheep are destructive to grass. They would soon kill out these ranges so that they would not be good for anything. The ranges are deteriorating. The ranges to-day in this county will not sustain one-twentieth of the live stock they would ten years ago. If these lands were in possession of the people, either by use or purchase, it would be much better. It is the only way to save these pasturage lands. They would then get better beef and more of it. I think the pasturage homestead is a first-rate idea. It would settle the country up as fast as it is susceptible of being settled. I have often thought of it, and I think it should be done. The large cattle owners ought to be protected, either by leasing the lands to them or allowing them to purchase. Idaho is mineral and pastoral, and these two interests must be protected. They are the wealth of this country. Cattle men are the only ones who take any interest in preserving the grasses. They now make some endeavor by uniting their herds and by pasturing alternate sections to preserve the grass.

The water rights are very well taken up. The water law here is: the first man who gets it keeps it, and the man who first takes it out retains the use and control of it, so far as natural needs are concerned, and then it goes back in the stream and his neighbors are entitled to the surplus. The only way any amount of water could be taken out is by uniting capital. The government should encourage irrigation by giving the companies proposing it each alternate section of land, or by offering some inducement.

The only mining district here is the Cariboo district. It is simply developing now, but there are good prospects of finding good lode claims there.

This is rather a poor county. The timber here is ravaged by fire all the time. No one now has any particular interest in it, and nobody cares for it. Something should be done to preserve the timber. I would put the whole matter under the district land offices, just as agricultural lands are, and I would arrange for the sale of this timber, in some way, so that persons would have some interest in it. They must preserve it. It is set fire to by Indians in order to run the game out; prospectors set fire to it and travelers are careless about their camp-fires. All the timber here is pine; there is no hard wood. No timber has been planted here yet. This arid land that is not susceptible of irrigation, I think, is worth about 5 cents per acre; that is as much as the government can expect to get for it. I think individuals should pay for the surveying, but that expense is as much as the government can expect from them. I think these questions should be settled at once. Now is the time. If it is not done there will be difficulty when the future population comes in. So far there has been no direct conflict between the cattle and sheep men. Cattle cannot stay where sheep will. If properly taken care of, 100 cattle will support a family. There is not much fencing here. You cannot fence cattle during a storm. The only way to fence a winter range would be to fence the bottom land where there is shelter for the cattle. I would not sell these lands in unlimited quantities, but would allow a man to take them in proportion to the cattle he has at the date of the passage of the act giving authority to sell them. The wealth of this country is in its herds, and always will be.

I think the rectangular system is a very good one; but there is very much bad work being done. Men cannot find the corners after one or two years. The stakes are destroyed, and the cattle paw the heaps of dirt down.

The supply of water here does not increase. Some years we have an abundance of water when we have had heavy snows, and then again when we have late snows we have little water; the streams then go almost dry. The Malad Valley has heretofore always had a splendid supply of water; but this year it has had so little that the crops have dried up. I always considered that the rainfall had gradually increased, until these two years past; but my experience for two years has contradicted that idea. The melted snow ordinarily provides enough water to ripen our crops. There is no dependence to be put on the rain. We raise all the cereals and all the vegetables that grow in a northern climate. To irrigate 100 acres right, and to irrigate it when needed, it would take 100 miner's inches of water flowing twenty-four hours. Different kinds of land take different amounts of water; it depends of course upon the kind of land. Irrigation enhances the value of lands by bringing in fertilizing salts and minerals. Lands that grow wheat crops year after year would not begin to grow the same crops in any other country. They would not wear as well without fertilization. Take this sage land: it looks as though it would not raise white beans; and yet it would raise fine crops of wheat for ten or twelve years without fertilization.

I do not know much about mines or mining, but I would place all questions pertaining to such matters in the hands of the registers and receivers of the local land offices,

I would permit the right of appeal to any local district court if there were two claimants to a piece of land. It is worth ten times more than a piece of land is worth to go to law about it. I think the papers in the land office could be much simplified and condensed. Everything connected with the land office is too expensive. The very routine you have to go through tends to confuse you in a hundred different ways; whereas if you had it simplified, and could have a case settled right at home in the local land office or in the local courts, it would cost much less. In proving up men have often to go five hundred miles to do it. The whole thing should be simplified. That is my experience after hundreds of entries.

Testimony of William G. Town, register, and E. S. Crocker, receiver, United States land office, Evanston, Wyo.

EVANSTON, *November* 4, 1879.

WILLIAM G. TOWN, register, and E. S. CROCKER, receiver of the United States land office, testified that they have been register and receiver ever since the organization of the above-named office.

The Evanston district embraces three counties extending, approximately, 400 miles from north to south, and 200 miles from east to west.

It is our opinion that the forms, &c., of papers in the land office should be simplified; registers and receivers should have a seal, and should have power to subpœna witnesses and perpetuate testimony. Our experience has led us to the conclusion that fees should be abolished, district land officers paid regular salaries, and that settlers should not be required to pay fees, as such, but that all fees should be embraced in the acreage cost of the land. As it is now local land officers have very little executive responsibility and are really only outside clerks of the department. This should be changed and they should be clothed with some official authority.

In cases involving contest or abandonment on desert, swamp, or homestead lands, it requires three months, on an average, to forward the cases to the department, and to have the case cleared up there and returned. The register and receiver should have authority to act in such cases and to send up the papers or file them, in their discretion, and let the legal qualified settler file at once; as it now is, the wrong man sometimes gets the land. A person should have the right to file as often as he pleases, on a desert, swamp, or homestead claim, because the land is enhanced in value by his improvements, the government does not lose anything, and the man himself does not eventually get more than one homestead. In our opinion miners and agriculturists should be allowed to file a thousand claims, if they so desire, until each gets a tract to live on.

More than a year ago we sent up cash entries for patents that have not been issued yet. All land cases should be patented in turn.

The present homestead and pre-emption allowance of 160 acres per settler is totally and entirely inapplicable to the lands in this district, which are of such a character that a settler and his family would meet certain starvation on any such sized tract.

The lands in this district are timber, mineral, and grazing. All the grazing lands are arid. There is no rain and no snow and but few running streams. The stock water comes from springs and streams. There is no agriculture to speak of in this district, all supplies of food other than the article of meat coming from California, Utah, Colorado, and the Eastern States. The timber in the mountains is mostly spruce and aspen, and cottonwood grows along the banks of the streams. We are informed that the north slope of the Black Hills is covered with beach, walnut, and pine. No timber has been planted in this district. Taking all the lands in this district we should say that 1 per cent. or less was in timber, and the rest, even the mineral lands, grazing. The timber lands should be surveyed and graded and sold in unlimited quantities, with this restriction or regulation: that the purchaser should clear off all dead timber so as to prevent fires, and that no timber should be cut for speculative or manufacturing purposes that was not over 8 inches in diameter. With a view to preventing fire, all dead timber now on the public lands should be given to any person who would remove it. The timber should be sold separate from the land, the title to which should remain in the government.

The United States district land officers, who live with the people and know their wants and ways, should be given full jurisdiction over the timber lands.

Settlers should not be prevented from cutting poles and posts for fencing, but they should be required to cut them out of the thick undergrowth so as to give the remainder of the timber a chance to grow. The destruction of the timber at this time is fearful. Twenty-five times more is destroyed than is used by the people. At the present rate, fire alone will utterly destroy all the timber within this district in five years. When once started they generally sweep clean, burning not only the standing and

dead timber, but the young growth and seeds as well, and the timber does not come up again. Fires are started either by the Indians driving game, or by white men through carelessness and recklessness. Persons can go on the timber lands and cut what timber they like, and much is unlawfully cut.

The arid or grazing lands should be surveyed and sold in quantities to suit purchasers at a price not to exceed 10 cents per acre. Pastoral homesteads of from 3,000 to 3,500 acres should be established by law. One hundred head of cattle in this country will keep a family; 25 to 30 acres of this land will feed a beef. Under constant sheep or cattle feeding the nutritive properties of the land gradually decreases, but if stockmen had specific ranges under their permanent control they could then move their cattle from part to part, and the grass, which is mostly bunch, could be preserved.

No law should be passed which would destroy our present cattle or sheep herds. They form the wealth of this country, which is solely adapted to grazing purposes. If the government does not sell these arid lands it should permit the present cattle and sheep owners to lease or occupy them under some law or regulation based upon the number of cattle and sheep they own at the date of the passage of the act, and the district land officers should issue permits to occupy quantities of land on proof of the size of their herds being made, and the same officers should have the power, as now, to take evidence of abandonment, and permit other occupants to go on the disused lands. The desert land act works well in this district; 640 acres is ordinarily sufficient to make effective its purpose.

The present system of surveying the public land is effective, and should be retained. The people are used to it, and can easily find their lands. More durable monuments and corners should be erected, and deputy surveyors should be held to strict compliance with their contracts. The boundary line between Utah and Wyoming was run in an improper and unskillful manner; posts are not set as required by law, and are missing in many places for miles consecutively. They are generally broken down by cattle. Wooden stakes should be done away with and metal substituted and driven into the ground so as to protrude therefrom about six inches. They would not decay as wooden stakes do, and the cattle would not be able to break them down.

There are no perceptible climatic changes in this district. There is a necessity for distinct cattle and sheep ranges, though cattle will graze on sheep lands for at least three seasons. In some parts of the district all the water that is available for stock has been taken up.

The final notice to prove up should be abolished.

There are about 100 townships plats in this office; in about two-thirds of the townships there is not a settler. We need surveys at present badly, and the sixth standard meridian line should be run so that townships can be surveyed and subdivided. This standard would run through Bear River Valley, which is the best part of the district and is well settled.

The best part of the district is occupied by the Shoshone and Bannock Indian reservation, which is about 75 miles square and contains from 1,500 to 2,500 Indians. This reservation contains a great deal of mineral—gold, silver, &c. There is no game in it and the Indians have to be fed by the government. They should be allowed 160 acres for each family and the rest of the reservation should be open to settlement.

Artesian wells have been sunk to the depth of 500 feet here, but were failures. There is one petroleum-oil spring in the northern part of the district and the oil obtained therefrom is used on the Northern Pacific Railroad for lubricating purposes. It flows about 30 gallons per day.

Coal extends from the line of the Northern Pacific Railway up to the Yellowstone.

This district could sustain fifty times as many cattle as are now in it.

All mining districts should be abolished and all claims recorded in the United States district land office, which should have authority to try all contests in mineral cases.

Experience has shown that square location in mineral (lode) claims would stop litigation. If made square the claim should be larger than 1,350 by 1,350.

The mining laws are very indefinite and complicated and are but little understood. They should be repealed and simpler ones substituted.

Testimony of Laurence F. J. Wrinkle, mining surveyor, Virginia City, Nev.

1. What is your name, residence, and occupation?

Laurence F. J. Wrinkle; Virginia City, Nev.; mining surveyor

LODE CLAIMS.

1. What experience have you had, and where and in what capacity, in the business of mining, mine surveying, and mine litigation?

Employed in United States surveyor-general's office, Navada, about three years.

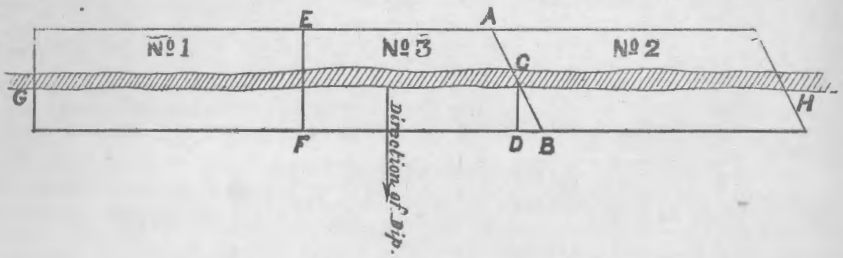
Have been mining surveyor principally on the Comstock lode about nine years. Have also within the last three or four years prepared, either wholly or in part, the mining applications for United States patent of about a dozen claimants.

2. What defects, if any, in the United States laws, their operation and administration as applied to lode claims, do you know, either from your own experience or from observation?

(1) The law is not sufficiently strict in requiring the location to be properly marked upon the ground. (2) Permits location records, which are often indefinite, because the descriptions of the claims are made by persons who do not understand how to describe them so a stranger can find out where they are situated. (3) Does not require the locator to see that his monuments are kept in their proper places upon the ground. (4) Does not require proof of having done one-hundred dollars' worth of holding work upon the claim during the year to be recorded, nor to specify *where* on the claim such work has been done.

As far as my observation goes, a very large part of mining litigation springs from disputes as to the actual position in which the original location-stakes of claims stood upon the ground (after such location stakes have disappeared, and the recorded notice of location merely describes the claim with reference to said stakes, with little or nothing to show how the actual position of those location-stakes is to be found in case they are removed or destroyed), and from disputes as to abandonment or failure of the prior locator to do the holding work required by law, such disputes arising in great measure on account of the laxity of the law in the particulars above mentioned.

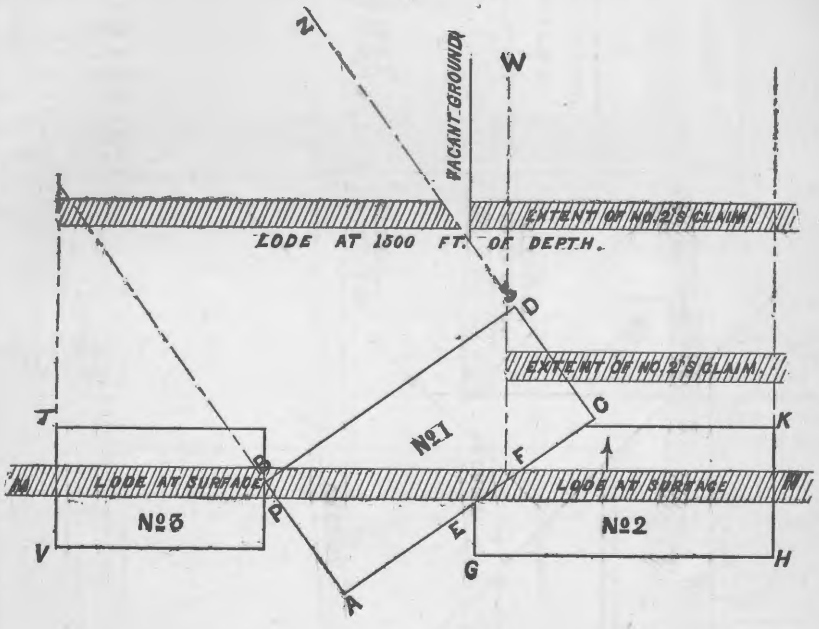
Another defect, in my opinion, is the provision which requires the end lines *in all cases* to be parallel. Take, for example, the case where No. 1 and No. 2 locate on the same lode, G H, leaving an intermediate portion of the lode less than 1,500 feet in



length, which No. 3 locates. No. 1 has made his end lines parallel with each other, and so also has No. 2; but No. 2's end lines are not parallel to No. 1's. Now, under the rulings of the General Land Office, if No. 3 makes one of his end lines coincide with the end line E F of No. 1, he cannot make his other end line coincide with A B, the end line of No. 2, but must run it in the direction C D, parallel to his other end line E F, leaving the triangular portion D C B, which nobody can locate, although the claim of No. 3 may be much less than 1,500 feet.

A still further defect is that the law does not indicate (at least, not fully) how the rights of contestants are to be determined in case a prior locator has mistaken the course of the ledge, which, instead of running lengthwise of his location, proves to run diagonally across it and into a subsequent location. The following sketches will show more clearly the cases I would call attention to: (See diagrams marked "Case A," "Case B," "Case C.") I have given to each contestant the ground to which I imagine he is entitled; in fact, I have decided the cases for myself, whether rightly or wrongly is immaterial, as far as the object of illustrating the want of clearness in the mining act is concerned. In "Case A" the prior location, "No. 1," runs diagonally across the lode M N, one end line, A B, crosses the apex of the lode at P, and the lode passes out of the location at the point F on the side line A C. A subsequent location, "No. 2," is made, of the which the end lines are G E and H K. How are the claims of No. 1 and No. 2 to be adjusted? In the case of The Flagstaff S. M. Co. *vs.* Helen Tarbet (reported in Copp's Land Owner for June, 1879), the court, in speaking of a person who (similar to No. 1) locates crosswise of a vein, says: "If he does locate his claim in that way, his rights must be subordinated to the rights of those who have properly located on the lode. Their right to follow the dip outside of their side lines cannot be interfered with by him. *His right to the lode only extends to so much of the lode as his claim covers.* * * * Though it should happen that the (crosswise) locator, by sinking shafts to a considerable depth, might strike the same vein on its subterranean descent, *he ought not to interfere* with those who, having properly located along the vein, are pursuing their right to follow the dip in a regular way. So far as he can work upon it, and not interfere with their right, he might probably do so, but no further; and this consequence would follow *irrespective of the priority of the locations.*"

Now, since the end line A B, crosses the apex of the lode, "No. 1" is entitled to follow the lode in depth along the vertical plane of said end line; but from the point F, where the vein leaves the claim through the side line, I think the above-quoted decision would indicate that "No. 1" is only entitled to follow down the dip of the lode; that is, "No. 1" would be bounded at the end next "No. 2" by a vertical plane passing through the point F at right angles to the course of the vein until such plane intersects the plane of the other end line C D, at S, then from S "No. 1" would be bounded by the plane C D S Z of the end line C D. "No. 1" should be limited by the plane of the end line C D Z in place of allowing him to follow indefinitely the plane F S W beyond the place of intersection, S; because, if he were allowed to do so, he would eventually acquire much more ground than he originally located.

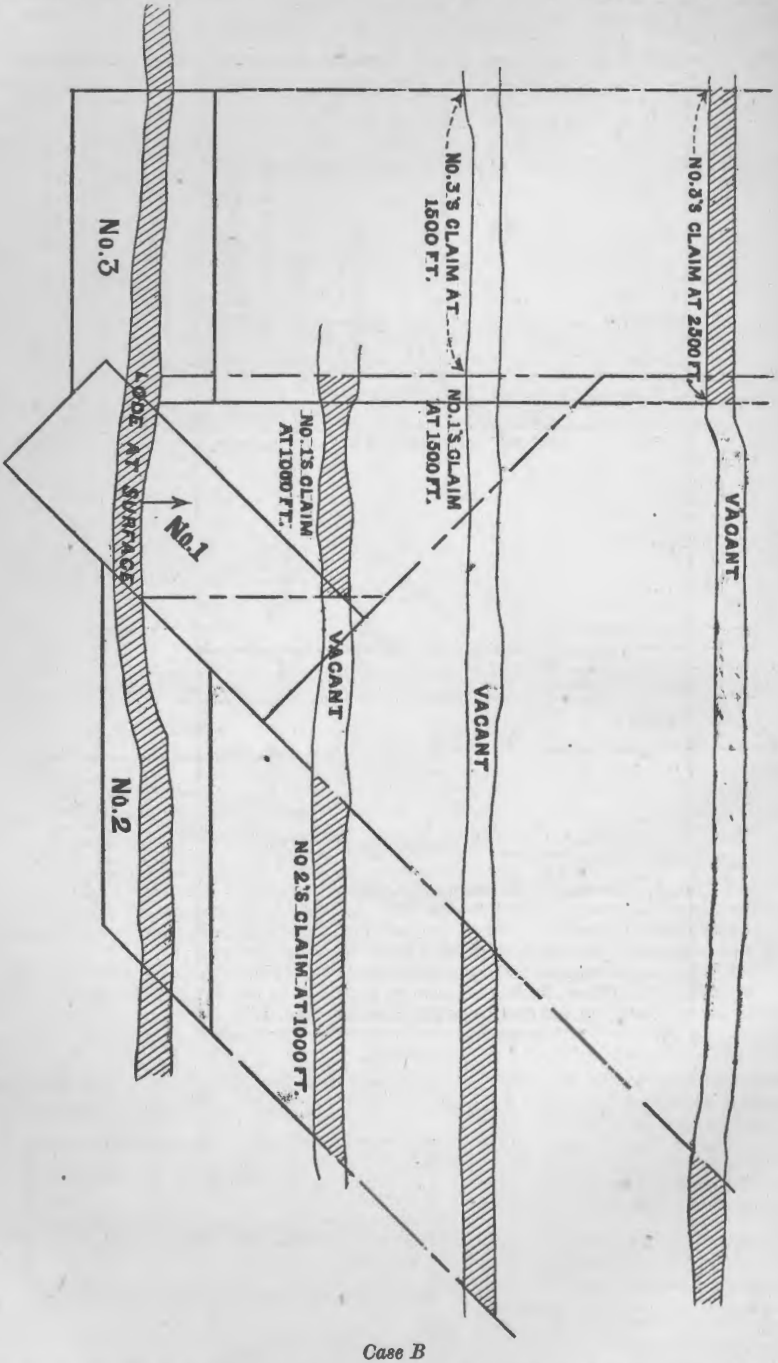


Case A.

"No. 2" must, towards the surface, relinquish a portion of his claim and respect the boundary fixed between "No. 2" and "No. 1," but with increase of depth "No. 2" may finally reach the plane of his original end line G E, beyond which he must not pass, and a piece of vacant ground will then be left between "No. 2" and "No. 1."

"No. 3" having to respect the boundary plane of "No. 1" on one end, and his own end line V T at the other, finds his claim to diminish in depth; but he can only blame himself for not locating his end lines parallel to "No. 1."

In case B, "No. 1" has not succeeded in crossing the apex of the lode with either end line; adopting the rule followed in Case A, that he is only entitled to follow

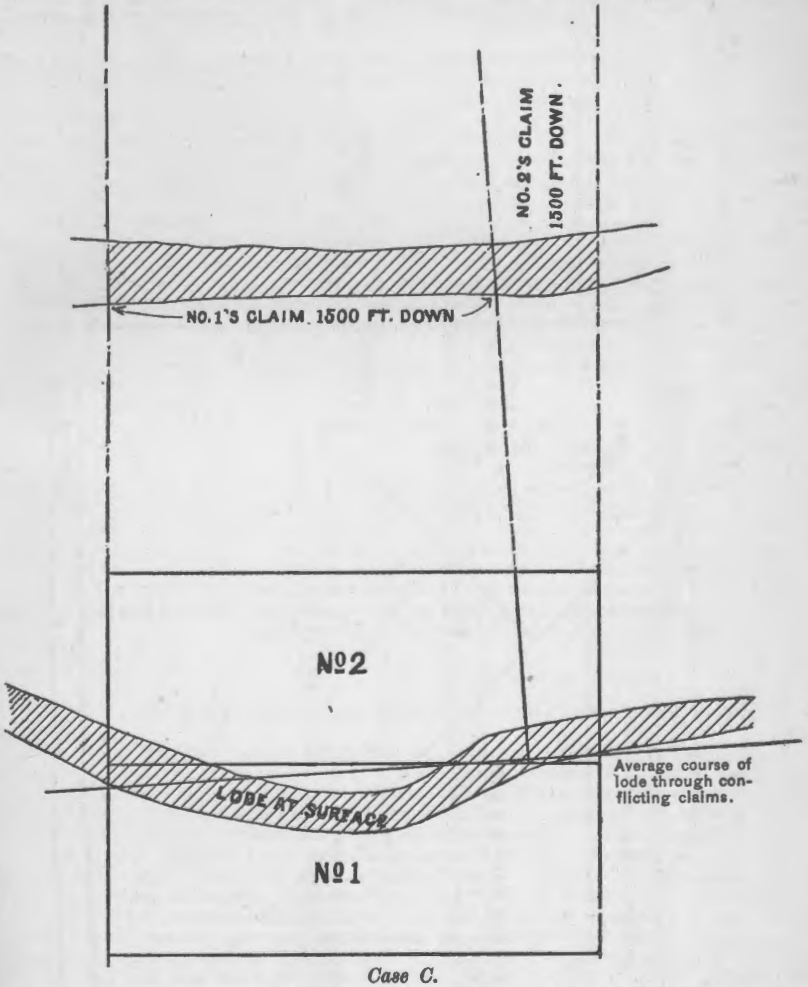


Case B

the dip of the lode between vertical planes at right angles to the strike or course of the lode, said planes passing through the extreme points of the lode intersected by the side lines of his location until he is intercepted by the plane of

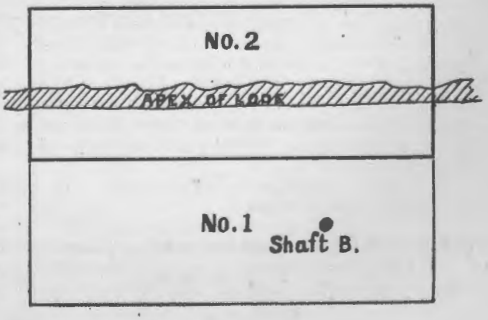
the end line established by himself; thus "No. 1," the prior locator is in depth shut out altogether. But on ascertaining this state of things he is at liberty to make a new location, taking in some or all of the vacant ground shown on the diagram, provided such new location does not conflict with the rights of third persons.

Case C is a modification of cases A and B, readily understood from the diagram.



Case C.

There are locations in this district which will probably in the future give rise to the questions presented by cases A, B, and C, and perhaps the law should indicate the rule to be followed in deciding them. If so, a fixed method of determining the average course of the ledge through the ground in controversy would also need to be prescribed.



Another case which *might* arise and work injustice under our present law (although I am not aware of such a case having actually occurred) is this: "No. 1" discovers a lode some distance below the surface in the shaft B, and makes his location "No. 1"; afterwards it is found that owing to the dip of the lode the apex is all within the sub-

sequent location "No. 2." Does it not follow from the decision in the case of the Flagstaff S. M. Co. vs. Helen Tarbet, above quoted, that "No. 2," who has "properly located along the vein," shall hold the same against the prior discoverer "No. 1," who has not properly located? Should not the law be amended to allow "No. 1" in such a case a certain limited time, say 60 days, to ascertain the true direction and dip of his vein, and make a proper location? Requiring him, however, to immediately file a record notice of such discovery, stating what length along the vein he intends to take on each side of the shaft.

4. What do you understand to be the top or apex of a vein or lode? Can or cannot the top or apex the course and angle or direction of the dip, always be determined in the early workings of the veins or lodes?

In case the vein outcrops at the surface, I would call any portion of such outcrop the top or apex. If the vein does not reach the surface, then the highest point to which the vein or lode can be traced is the apex (not necessarily the nearest point to the surface, but the absolute highest point), using the term vein or lode in the sense adopted in the case of the Eureka Consolidated vs. Richmond. If the vein does not outcrop on the surface, the apex is only to be discovered by exploration. The course on the surface, owing to inequalities of elevation and of the dip of the ledge, often varies from the course shown by a level underground. The dip may change to be steeper or flatter from one level to another. Generally in making locations no systematic effort beyond surface observation is made to ascertain the apex and course of a ledge; reliance is placed on luck very often in that matter as well as in the matter of finding pay ore in the claim.

5. I think all rights a discoverer or prospector actually secures (although in some cases not all he intended to secure) under his location can be properly defined and protected by the present law with some few amendments. I think a prospector who locates a claim and strikes a lode which turns out to belong to his neighbor, because the top of the lode is in the neighbor's claim, has no more reason to complain of the law than he would if he failed to find ore in his claim. In the same way a man who locates across a lode instead of along it—the law gives him the right to locate 1,500 feet along the lode—but if he makes his location, in the exercise of that right, in a way to cover less than 1,500 feet, he can only blame his own ignorance or want of luck. Let it, once for all, be understood that the location must cover the apex of the vein throughout the length of the claim, and more attention will be given to this matter by locators and purchasers. In general, a man can hardly be called a discoverer of a lode if he is ignorant of its position on the surface, or he may discover 500 feet but not 1,500 feet.

6. Litigation has, but not to my knowledge any injustice.

7. Yes.

8. No.

9. Yes.

10. Yes; but the locator might have made his location follow the windings of the lode.

11. In general, I believe it makes no difference to the locators upon true lodes how many locations are made upon barren ground. I apprehend that, at the outset, especially in a new mineral district, it would be a difficult matter to draw the line between what are locations on real lodes and what are locations upon barren ground. This facility of making alleged mineral locations has enabled individuals to monopolize the surface-ground in front of certain claims on the Comstock lode, which Comstock claims required the ground for shafts, &c., and had to pay a few thousand dollars extra for the ground to the "wild-cat" owners. Comstock owners have thus compromised with these claimants instead of availing themselves of the Nevada statute (which allows non-mineral lands to be condemned where necessary for the effective working of a mine), except in the case of the Oberman Company *et al.*, which procured the condemnation of the "Yankee" mining claim for a site for the Forman shaft. Litigation in this case is still pending; this litigation, if persevered in, may help to determine what, under the law, constitutes a valid mining claim. In a mineral district, small seams may very often be found yielding low or tolerable assays of precious metal, and occasionally these small seams lead to workable deposits of ore, though ordinarily the contrary is the case. Many of the barren "wild-cat" locations cover such small seams. Between the United States and the claimants of alleged mineral ground, it would seem to be to the interest of the United States to dispose of its title and receive pay for the same. Let those who wish to prevent the sale of United States land as mineral prove its non-mineral character in every case. Greater strictness in requiring the full amount of the annual expenditure, and a provision analogous to that suggested in reply to question 22, would do away with many of these wild-cat locations.

12. Yes, litigation is liable to occur. The legislation of the mining States, I believe, provides for such cases.

13. As to the first question, I reply, yes. As to the other question, I am sure the bulk of the litigation in this district arose from the causes specified in reply to question

No. 2, and from disputes as to whether the Comstock lode was only one vein or several parallel veins; the locations about which most of the litigation has occurred having been made under the act of 1866 or previous thereto.

14. Accepting the definition of a lode as given in the decision of the Eureka Consolidated *vs.* Richmond as the true one, which I think it is, "the variety and complexity of mineral deposits in rock in place" enters but slightly into the question. The question really will be whether the "lode" (as thus defined) can possibly be traced by means of its walls, as they continue downward beyond the side lines of the location; when the dip of a vein can thus be followed downward, it is quite possible also to ascertain the apex of the vein merely by following the dip upward instead of downward; and whoever has the apex must have the whole vein. Of course, where there is any doubt as to whether the mineral is contained in a regular "lode" or in an irregular deposit, litigation to bring forth all the facts of the case must ensue. I do not believe any law can be devised which will entirely shut off litigation; cupidity will always be able to devise ways to attack valuable mining property.

To give the right to the discoverer of an ore-producing vein to make a square location of 1,500 feet on a side, with the right to all the mineral included within vertical planes passing through the lines of such location, not permitting such locator to follow the dip beyond his lines might prevent some of the litigation which now arises. But would not litigation on new points arise to take its place? And would not such a system have drawbacks that would counterbalance whatever advantage might follow immunity from litigation? One of the drawbacks is, that while the lucky prospector or discoverer might reap a greater reward than now for his exertions, since by discovering a comparatively unimportant vein he might secure a much richer vein lying within 1,500 feet, of whose existence he had no knowledge at the date of location; in fact, he might, by the discovery of a small outcrop, easily monopolize a large portion of a valuable mining district, shutting out many just as diligent and meritorious prospectors as himself—the present law giving the discoverer all he actually finds—while the square location might make him the constructive discoverer of a vein a thousand times more valuable than the one he really found, yet, on the other hand, the square location would place the actual ore producer and developer of mines at a disadvantage as compared with his privileges under the present law. By square locations a few impecunious individuals might monopolize a whole mining district and thus retard its development. Capital would also be more afraid to invest than now, because every vein with a dip would have an artificial bottom (where the vein passes out of the location), and the real bottom is now very often reached too soon.

The annexed diagram shows how such a law would have worked on the Comstock.

The red lines A, B, C, D, represent the boundaries of the first series of square locations, and C, D, E, F the boundaries of the second series of square locations that would have had to be made on the Comstock lode, and the dotted red line shows the eastern limit of the present workings at an average depth of probably 2,400 feet below the croppings. The places shaded red upon the map and marked bonanza indicate all the ore-producing ground thus far found within the limits of the supposed second series of square locations. As it would be manifestly impolitic to let such square locations be valid until ore was actually found within their limits, the majority of the Comstock companies would now be drifting around without secure title to any ground, which circumstance would render it difficult to collect assessments to prosecute further explorations. As an illustration, consider the case of the Sierra Nevada and Union. The Sierra Nevada and Union bonanza was discovered by the Sierra Nevada Company at a depth of 2,100 feet; this company vigorously explored the full length and breadth of their location at different levels through the Sierra Nevada shaft, doing all the work by assessments, and most of the time through very unpromising ground, with no encouragement except the fact that the lode still continued and the hope that finally an ore body would be reached. Could the Sierra Nevada Company have raised money to spend on such work if there had been any danger of a stranger sinking a shaft and striking the ore before them, and thus depriving them—the grantees of the original discoverers of that portion of the Comstock lode—of the fruits of all their labor, as would be possible under a square location law? As a fact, the Union shaft, which was started and sunk 1,300 feet by an outside company in the hope of finding a ledge east of the Comstock, would certainly have reached the ore before the Sierra Nevada workings if the then owners of said shaft had been incited to energetic work by the chance of securing a part of the Comstock lode. The Union shaft reaches this ore body at a depth of about 2,250 feet. Yet in all probability if such square location law had been in force, neither the Sierra Nevada shaft nor the Union shaft would ever have been sunk, nor the bonanza, worth millions, ever found. For before the present Sierra Nevada shaft was started an older shaft was sunk 800 feet and the vein prospected therefrom at different levels, all the way through barren ground; if to this fact had been added uncertainty as to the further depth to which they might go before being cut off by some more fortunate explorer, the costly hoisting works over the present Sierra Nevada shaft would never have been erected, and the ground would

have been condemned in popular estimation as utterly worthless and barren, and it would have been impossible to raise money for any mining operation in that vicinity.

Another complication which I imagine might arise under a square location law is this: The first discoverer of an ore body being entitled to make his square location in the most advantageous way, in the case before us the Sierra Nevada Company, having reached the ore long before the Union, would locate directly in front of said Union Consolidated Company's workings, cutting them off altogether after they have spent years exploring the barren upper portion of the lode—a hardship and injustice beyond any likely to happen under our present law.

Moreover, it necessarily follows that if a miner were not allowed to own his ledge beyond his side lines, that portion beyond would be subject to appropriation (to the extent of 1,500 feet square) by the first one who would sink a shaft, strike the ledge, and discover ore therein. It is not a sufficient answer to this to say that the original locator would have an equal chance to sink and explore beyond the side lines of his location; because the simple sinking of a vertical shaft is not subject to so many delays, difficulties, and dangers as attend the opening of a mine from level to level throughout its length and breadth, and the extraction of such ore as may fortunately be found, the raising of which ore of course delays sinking. The case of the Savage and Hale and Norcross companies may be referred to as an example. These companies have worked along the vein to a vertical depth of about 2,500 feet below the outcrop and (as shown by the dotted red line on the diagram) have nearly reached the easterly limit (red line E F on diagram) of the second series of supposed square locations. At this depth a tremendous influx of hot water occurred in the Savage mine, flooding it and the Hale and Norcross. Very expensive pumping machinery was put up by each company for the purpose of disposing of the water. After the expenditure of more than a million of money and more than two years' labor, they have with the aid of the Sutro tunnel drained their mines. This contest with the water strained to the utmost the resources of these companies; during the time that they were struggling with that element which has caused the abandonment of so many productive mines a company of adventurers might have sunk a shaft, say in the position of the Requa shaft, down into the Comstock lode. Would it be fair now to give such adventurers an equal chance with those companies to search for ore and enjoy it when found? So, two or more companies of adventurers might sink shafts near each other in front of the Comstock lode, the company that found ore first would survey the other shafts into their location, at once a waste of capital and a fruitful source of litigation.

Furthermore, the party sinking a shaft over the dip of a vein, beyond the limits of a prior square location, would enjoy another advantage over the original locator working down on the dip of a vein, in the possibility that his shaft might develop, at a lesser depth, an outlying vein or a seam or feeder of the vein originally sought, which might yield ore, thus securing to the owner of the shaft his location 1,500 feet square, and at the same time destroying the prospects the original locator had of being able to follow his lode beyond the side lines of his location; and in case such original locator, fearing the above result, were himself to start a shaft for prospecting beyond his side lines, he would have to weigh his chances of competing with rivals in choosing the site of the shaft instead of considering its advantages for the economical working of the vein in the future as is now done; witness the Forman, Requa, and Osbiston shafts, which are located far beyond the line of the second series of square (1,500 feet wide) locations. That the above objection has foundation in fact may be seen by referring to the Silver Hill and Justice claims, shown on the diagram, at the south end of the Comstock lode. In front of them lie several claims containing ore; one of them, the Cook and Gray, has yielded more than forty thousand dollars' worth of ore. If square locations had been allowable, this ground in front would naturally be located somewhat as shown by the yellow shading (occupying the whole of the second tier of square locations), and thus the Silver Hill and Justice mines would be cut off from further working. But under the present law, which suits them very well, these mines, which probably so far have no more than paid expenses, although they have yielded about two million dollars' worth of ore, thus benefiting the community, being now possessed of machinery well calculated for deeper workings, continue their explorations in the hope of finally finding a bonanza which will yield a profit on all their expenditures.

To show how litigation might in another way arise from square locations, I have placed in their true position upon the diagram a few of the "outside claims" that abound in the neighborhood of the Comstock, namely, Scorpion, the Leviathan, and the Sullivan. The heavy lines show the present limits of these locations, and the yellow shaded lines what they would probably have been (1,500 feet wide) under a square location law. These claims all have promising ledges of their own, and may, by further exploration, find ore. The Scorpion has a United States patent. Under the present law they are a detriment to no one except, perhaps, their owners. But under a square location law, and the stimulus of a prospective slice of the Comstock, they might possibly all be soon induced to yield sufficient ore to render them valid square locations, and their

owners would become the owners of all mineral within their boundaries to the center of the earth, with what results to Comstock mines the diagram shows.

Señor Gamboa, in his Commentary on the Spanish Mining Laws, mentions a case where the pious claimants of such a square location took the priest out to bless the pit out of which the ore which made the location valid had been taken in order that success might attend their further explorations. It afterward was found they had salted the pit. I fear, if we should introduce such a law, many an honest miner would have occasion to curse such pits From the numerous lawsuits referred to by Gamboa, I should infer that litigation was rather frequent under the Spanish (square location) laws he treats of.

The truth probably is that a square-location law would work passably down to a limited depth, beyond which the interests of deserving miners would suffer. The Mexican-Spanish (square location) law was suitable for its day and generation, but that day has passed. When said law was framed 600 or 800 feet was an astonishing depth to work a mine. About that time a Mexican drain-tunnel, pushed with every resource of skill and energy, was advanced toward the Biscayna vein 2,500 feet in five years. The Sutro tunnel commonly advances more than that in nine months. The Mexicans reached a depth of 1,500 feet in three hundred years; we have gone down 3,000 feet in twenty years. With the rapid improvement of labor-saving mining machinery and engineering appliances, poorer veins than the Comstock will, in the near future, be worked as rapidly to as great and greater depths than the Comstock, and perhaps richer veins also, yet to be discovered throughout the vast extent of our mining regions. Moreover, the present law is an indigenous product, the legitimate offspring of our institutions and the peculiar circumstances of our own miners, based in great part upon their local regulations. It has undergone a gradual process of development and improvement by statutory enactments and judicial decisions, from the commencement of mining on this coast up to the present time. Such gradual amendment should continue to be made as experience shall show its necessity, but we should make no radical change from the present system, which is so well calculated to encourage and protect mining to the greatest depths attainable by the resources at our command.

19. The mining law should be uniform. I think all mining-district laws and customs could be advantageously abolished, leaving the mining acts of Congress alone; but the district recorders could hardly be replaced by the United States land officers, because new districts are constantly being found remote from settlements, and to abolish the office of district recorder would lead to inconvenience, confusion, and expense, which locators generally cannot afford. Certain changes in the mode of locating and recording, suggested in reply to question 21, would remove some of the objections to district records.

20. I think not, because very often, as compared with land contests, the questions to be decided are more complicated, the property in controversy more valuable, the evidence of possession, &c., is often conflicting, requiring to be sifted by a jury; the judges of the State courts are elected by the people, more directly amenable to them for misconduct, and generally better versed in the law than the local United States land officers, while appeals to Washington, which would constantly be made, would be more expensive and dilatory than litigation in the local courts.

22. I think the most practicable way to induce locators to apply soon for United States patent would be to lessen the expense of getting such patent. Publication of notice might in some cases be dispensed with, as suggested in reply to question 21. The price of the land is not much of an object to the government. It would be rather harsh, I think, to forfeit a claim for neglect in this respect.

21. The amendments I would suggest refer principally to fixing the locations, as follows:

The location.—The center line of the location shall be marked by a line of posts or monuments placed along the course and windings of the lode, as near as can be ascertained, said posts to be not more than 300 feet apart and within sight of each other, beginning at one end of the claim at a post marked the "beginning post;" said posts or monuments to be uniform in appearance and substantially erected to a height of at least 4 feet above the ground and conspicuously and permanently marked with the name of the claim; and each intermediate post shall also have marked upon it the distance in feet from the beginning post to that particular post; and the locator shall place upon the beginning post and maintain thereon, until United States survey of the claim shall be made and recorded as hereinafter provided, a memorandum, giving the name of the locator, date of the location, length of the claim, and distance from said beginning post to each intermediate post, also the width claimed on each side of the center line thus established on the ground; the location, to be filed in the proper district recorder's office as soon as possible, shall give all the data prescribed for the above memorandum at the beginning post and shall fix the position of said beginning post and such intermediate posts as may be available, by reference by distance and direction to near and prominent permanent objects; said notice of location to be signed by the locator and one or more witnesses, who shall testify to the fact of the

posts being set and marked according to law. Then, within one year of making such location, the locator shall procure a survey of his claim to be made by a duly qualified United States deputy mineral surveyor, who shall personally see to the placing of the corner posts of the claim under the regulations and instructions of the Commissioner of the General Land Office. The end lines of the claim must be at right angles to the course from the beginning post to the first intermediate post, except where the claim begins at the end of another claim upon the same vein, the end lines of which have already been fixed by United States survey, in which case the end lines shall coincide in direction with those of said prior United States survey; and also except where the claim embraces all the ground lying between two other surveyed claims, neither of which has been located by the present locator, in which case the end of his lines may be made to coincide with the end lines of such adjoining claims, it being understood that the center line of such United States survey must begin at the beginning post of the claim (unless said beginning post is within the limits of a still valid location described by a prior United States survey), and follow the line of posts set on the ground to mark the location for a distance not exceeding 1,500 feet, nor extending beyond the last post set on the location line, even if it is at a less distance than 1,500 feet from the beginning post, and although the location notice may call for 1,500 feet. It shall be the duty of the United States deputy mineral surveyor to file a copy of the plat and field-notes of such survey in the proper United States surveyor-general's office for his approval, without unnecessary delay, after he has been paid for such survey. And, after approval, no further survey will be required when the locator or his grantors apply for United States patent for the claim. The United States deputy mineral surveyor shall, after such approval, also furnish the owner a full and accurate description of said United States survey, for record by the owner in the proper county recorder's office. Until such record is made, any person otherwise qualified shall have the right to enter upon and take actual *bona-fide* occupation of whatsoever part of the surface ground embraced by such location as may not be actually occupied by the locator with *useful* mine workings or buildings, and may use such surface for any purpose whatever not conflicting with the locator's right to the precious metals; and the exclusive possession of the locator shall only extend to that portion of the surface ground not thus occupied prior to the record of said United States survey in the proper county recorder's office; provided, however, that the locator may, if he chooses, dispense with the preliminary location of the center line and initiate his claim by causing the above United States survey to be made. The date of the survey will then be the date of the location, and such date shall be the time when the corner posts are actually placed in position on the ground by the United States deputy mineral surveyor. Record is to be made in such case in both district and county recorder's offices. And in case such survey is made and recorded as directed within one year from the date of the location, the expense of such survey, to the extent of $50, may be counted as part of the $100 worth of "holding work" required by law for that year, the locator, however, to make his own terms with the surveyor regarding payment.

A penalty should be imposed for removing or defacing the posts of a United States survey of a still valid location.

Any party having an adverse claim to any portion of the ground included in such United States survey may bring suit in the proper court at any time within two years from the date of record in the county recorder's office of said United States survey, in order to determine their right to the ground in controversy; if they fail to bring suit within such period of two years their adverse claim will be barred, provided the posts of said United States survey have been kept standing in their proper places on the ground during that time, and conspicuously marked with the name of the claim and the number of the United States survey. An affidavit by the owner or his agent of continuous possession, with that of two witnesses of the fact of said United States survey posts having remained standing in their proper places during two years from the date of record of said survey, with certificate from the clerk of the court that no suit has been brought for any portion of said claim during that time other than what has been decided in favor of the applicant, and the usual abstract of title and certificate of work done, shall entitle him to United States patent, on payment for the land and the necessary plats and descriptions from the United States surveyor-general's office, without putting notice in the newspaper and on the claim as now required; but the claimant may have the option of publishing notice of application for patent at any time as heretofore.

Affidavits by the owner or his agent and two witnesses must be filed in the county recorder's office at the end of each year from the date of location, specifying the value and kind of labor and improvements (for "holding work"), and the precise locality upon the claim *where* such labor and improvements have been done; also, the date or dates *when*. And a failure by the claimant to comply with the regulations as to keeping memorandum on the claim, marking and preservation of posts and monuments, and record of affidavit of "holding work" done on the claim, shall render said claimant liable for

damages to any person who, without notice, relocates the claim or any part thereof, and is put to useless expense through the neglect of the aforesaid claimant.

No United States mineral survey shall be made over any portion of a prior United States mineral survey, unless the claim embraced by such prior United States survey be proved to be abandoned or forfeited, and personal notice or by publication shall be given to the claimant of such prior United States survey that a new United States survey is about to be made.

Testimony of H. M. Atkinson, of Santa Fé, N. Mex.

SANTA FÉ, N. MEX., *September* 2, 1879.

H. M. ATKINSON, surveyor-general of New Mexico, made the following statement:

I am in favor of retaining the rectangular system of parceling the public land. It is cheaper than any other system, and the settlers understand it. Owing to its simplicity, it is a very easy matter for them to find the corners if they are properly placed. I think the system can be improved. For instance, establish certain time points, either by astronomical observation or triangulation, for the sake of accuracy. If the points are not near together they could be more cheaply determined by astronomical observation. I would suggest that at perhaps every fourth township a very large monument of stone be placed, similar to those used for Territorial boundaries. They should be of some durable material, such as a metal stake, perhaps corrugated iron would be advisable, but the present system of subdivision and exteriors I consider preferable to establishing them by triangulation. I favor triangulation for the purpose of getting over deserts, mountains, or other obstacles where chaining cannot well be done or townshiping or subdivision is not desirable, yet keeping up the distances as though it had been done by chaining. My idea is to get something permanent, no matter what you may settle on. The system of triangulation is of course more accurate, but it would require a large additional expense to change the system, and then it is not only the direct expense, but it would be an expense to the settlers, for they would have to employ surveyors.

The wooden stakes now used are frequently destroyed by different means. The cattle rub against them and paw them down and they rot away. I think the monuments ought to be of stone or of metal, or of something durable and lasting.

I would suggest another improvement. If the deputy surveyors would take into the field with them aneroid barometers and take the elevations and depressions, it would enable them to establish the contours of the country. It could be done at very little expense, merely the time and the cost of a barometer.

In order that the classification of the land into mineral, agricultural, arid, &c., as now required by law, should be more accurately made, I think a geologist competent to determine the character of the land should accompany each deputy surveyor's party. This geologist could be selected either by the General Land Office or the surveyor-general. The deputy surveyors under the present system do the work cheaper than it could otherwise be done.

All the land ought to be surveyed, for this reason: the classification which Congress makes results in this, that small portions or townships are surveyed (the arable portion or irrigable portion), leaving the balance unsubdivided and to be subdivided at some future time. It costs just as much to make a plat of a fragmentary part as it does to make a plat of an entire township. It makes double the work subsequently. Frequently men want it for the timber outside of the arable portion, or for grazing land. These grazing lands are of no earthly use for agricultural purposes, and there is no reason why they should not be surveyed and utilized for stock-raising. I think if I owned that land I certainly should want to receive some income from it. I would dispose of it to men who could utilize it, and the government should do business on the same principle. It gains nothing by holding these lands; they will not for many years become arable. Frequently we survey the whole exterior lines in order to get the inner boundary of a fractional township. The average cost of surveying the exteriors of a township is $8 per mile, or $190 to $200 for the exteriors.

We have two classes of land, mineral and arable, and a considerable portion of irrigable land. There are from 3,000,000 to 8,000,000 acres of arable and irrigable lands unsurveyed, lying in every section of the country. Except by hunters and prospectors, very little is known practically of the southwestern portion of the Territory above Silver City and on through to the Arizona line. A good portion of this land in the mountains is timber land. Fine timber is also found on the mesas. There is mineral all through the Territory, though it is comparatively undeveloped. We have almost all the economic minerals: gold, silver, copper, iron, lead, mica, &c. There has been more substantial prospecting done in the last six months than has ever been done before. Wherever ledges have been struck valuable deposits have

been found. There ought to be some modification in the mining law. Do away with these district local usages and have one United States law or system of laws to govern all the mineral districts. There ought to be a law passed putting the filing of mineral claims in the hands of the registers and receivers of the various land districts, and then they should appoint deputies in those counties of districts that are a long way from the land office. The present law should be amended in this respect, and the record of these filings should be "noticed." The United States, in agricultural and other classes of land, retains the title to the land from the minute of survey till the issuing of the patent. Why should this not be the case with mineral land? It would simplify the whole matter to keep it in the hands of the government. As it is, one mining district has one set of rules, and another, right next to it, has a different set of rules, making it very annoying and giving rise to vexatious litigation. If the law was universal everybody would get to understand it and become familiar with it.

Question. Do you know what the "apex" of a lode is?—Answer. I suppose it to mean where the lode appears on the surface, but I believe the courts do not so consider it. I think the claims should be confined to their side as well as their end lines, giving each one 20.66 acres. As the mineral resources of New Mexico are just opening up, I think some legislation ought to be enacted to obviate endless mining litigation.

In regard to the pastoral lands I am in favor of having them surveyed, graded in price, and offered for sale at private entry in as large amounts as the purchaser desires; and yet for some reasons it might be well to limit the amount.

Q. Would you be willing to allow an actual settler to take up land sufficient to keep a herd that would support his family in the same way that a man is allowed to take up an agricultural homestead—a sort of pasturage homestead?—A. I should think that a very good thing, though I never thought of it before.

There is one thing I should like to speak of. I think the small Mexican settlements, occupying little tracts of land along the streams, as they do now, ought to be protected; and in order to protect them in their rights I would provide that they should either take it as town sites or else they should pay for the land as other people do, in legal subdivisions, which could be again divided into subdivisions of 40, 20, 10, or even 5 acres, to accommodate the small owners, or else divide them up in such a way as would least affect the present boundaries of their claims. I would not, however, destroy the regularity of the present system of surveys. These people have no title from the United States to their lands, but they have lived there a long time, were the original owners of the land, and they should be protected.

Q. At what price would you sell the pasturage land?—A. It depends altogether on the proximity to water. They should be graded, perhaps, from 25 or 30 cents to $1.25 per acre. This grading could be done on the classification made by the deputy.

The water rights are not all taken up in this Territory. There are plenty of water rights which could be taken on the Pecos. There is sufficient to irrigate with on that stream. In so far as the country is settled the water is taken up, but all the country is not yet settled.

The proportion of agriculture to stock-raising is about one to four in favor of stock-raising as against agriculture; that is, as to the value of the product. As regards the capital invested, I think that there is about $20,000,000 invested in stock-raising against $4,000,000 or $5,000,000 invested in agriculture.

Of late there has been a very perceptible increase in agriculture and there has also been an increase in stock-raising. They are bringing stock in here from California, Texas, and other places, and these pasturage lands are becoming very desirable. They will bring almost as much for that purpose as they would ordinarily for agricultural purposes. I consider 30 acres of land a liberal estimate for preparing a beef for market, and one beef will equal five or six sheep. There is room for more cattle here yet; millions of acres are still unused. This year has been an unusually dry season, but the rainfall here last year was nearly 16 inches; at Mesilla it was about 8 inches, and at Silver City it was between 16 and 17 inches. This was a little dryer than the season before I came here. This year there has been a perceptible decrease, but the general rainfall seems to be increasing. From the suppression of the forest fires the vegetation is, I think, increasing. There is a great deal of timber here; the mountains, foot-hills, and mesas are covered with pines, aspens, cedars, &c. These timber lands are not much injured by depredations, and a great degree of caution is exercised by the people in regard to forest fires.

Q. What disposition would you make of these timber lands?—A. I would sell them. I can see no advantage in holding them. I would sell them under the present legal subdivisions in any amount a man wanted, for if I wanted 1,000 acres for milling purposes I would get it in some way. I do not believe a graduated method of cutting the timber could be established here, though I think everything possible ought to be done to encourage the growth of the timber. I think the supervision of the timber lands should be placed in the hands of the register and receiver, as they are right on the ground all the time and can exercise a more intelligent jurisdiction over it than any one else.

They could administer the laws better than an outside agent. There is a much larger scope of this country that is capable of agriculture than is supposed. My impression when I came here was that a very small part of it was fit for agriculture; but the prospectors in the south and west are showing up considerable areas of arable land.

Q. How would you prevent this land from being taken up as pasturage land at a low price?—A. I would reserve the arable portion from private sale and dispose of it under the homestead law. I would abolish the pre-emption law.

Q. Why?—A. Because the homestead law has a pre-emption feature in it already.

Q. How could you classify the land?—A. That could be done by the deputy surveyor and the geologist, who should be appointed to go along to classify the land.

Q. And how could you determine just what was irrigable land?—A. Wherever there was water accessible the surveyor would know that so much of the land near by was irrigable.

Q. And how could you make a practical division so that these gentlemen here by looking on this map would know what is irrigable and what is pasturage?—A. From the information collected by the surveyor in making his plats, I would have the draughtsman simply note—say, here is a section—I would have him note that this 40 acres is arable, at $1.25 per acre; this 40 acres is timber, of commercial value, so much per acre for that; and that 40 acres is, perhaps, grazing land; and another 80 acres may be arid or be mesa land. In subdividing they run around the entire section, and they can form a pretty good opinion of the entire section from the observations they then make.

Q. You would have this classification made by the deputy surveyor and the geologist appointed to go along with him, who would measure the streams and determine how much water there was in them annually, and then mark the limits to where the water could be carried?—A. I think he could determine that approximately by his eye. If he made a mistake and it is not arable, still I should classify it as arable, for there is a probability of its being so. I require them to measure the streams now, and their notes show everything—the depth, height, &c.

Q. Suppose it should turn out that there is not water enough for all this land that you have determined to be irrigable, and you sell it to citizens of the United States, and it turns out afterwards that there is not enough water?—A. Well, it is their lookout. If they buy something and pay $1.25 for it, and it does not turn out as they expected, it is their lookout.

Q. But you classify the several pieces of land for the citizen?—A. The citizen should go and make an examination beforehand.

Q. If the government undertakes to sell a piece of land as irrigable, the government ought to know whether it is irrigable or not, and it takes the money of the citizen under the supposition that it is irrigable, does it not?—A. They do under this system.

Q. Suppose a man buys land low down on the stream as irrigable land, and pays for it; along comes another man who buys land higher up and takes all the water. How would you arrange that?—A. That is something I have never thought of.

Q. What is your present law of water rights here? Does the first man who occupies the land take all the water, returning such as he does not need to the stream again?—A. Yes; that is the local law here, I think.

Q. Do you think that there will be any difficulty in adjusting these conflicting interests and conflicting rights?—A. There might be eventually, perhaps, something of that kind. You cannot have any general law that will not operate harshly in some instances. When the government makes this classification of land I go down there to make my settlement near the mouth of a stream or valley. I take my chances of settlers coming in above me and absorbing a good portion of the water. That is something I don't think you can regulate. You can only have a general rule that the water shall not be wasted.

Q. Why should the government not sell a man the water right, when it sells him 160 acres of irrigable land? It is known how much water is wanted for a certain quantity of land. Why not let this water right run with this land forever? If the government finds that it has not enough water in the stream, let them stop selling the land as irrigable land, and sell the balance as pasturage land.—A. Perhaps that would be a good idea. I have not given that subject any consideration, and can only jump at a conclusion.

Q. Do you think a general system of irrigation ditches could be constructed in this Territory with profit?—A. I think they could in some sections—on the Pecos and Rio Grande Rivers. There is an immense area that can be irrigated there.

Q. Does it destroy the land or improve it?—A. Irrigation improves the land; it enriches the soil.

Q. Does it increase or destroy the growing capacity of the land, year by year?—A. That I cannot say. They have raised here, for years and years, crops, without fail and without fertilization.

Q. Don't the grazing capacity of the land decrease, year by year?—A. That depends on the size of the herd.

Q. If the land is well stocked, does it not take more grass to graze that herd each year?—A. Yes; I think it does.

Q. Are there conflicts between the sheep and cattle men?—A. Yes; all the time.

Q. Where do you sell your stock?—A. In Chicago, Kansas City, New York, Boston, and England. It is driven right to the depot and shipped.

Q. Can grapes be grown in New Mexico?—A. Yes, sir. I think this Territory will be one of the finest grape districts in the country. It will be the Rhine of America.

I should like to say a word about the Spanish-Mexican grants. There are about 140 such grants filed in this office and others are being filed every year. Just how many exist I cannot state. They are coming in all the time. They date back into the sixteenth century. Now, I think the rights of the parties holding these grants should be settled and the remainder turned over as public domain, so that when settlers come in here they will know whether they are on government land or grant land, and the improvements they have made, often of value, will not be jeopardized. This should be settled immediately. There ought to be a limitation fixed by law for the filing of the claims and proving up.

Testimony of W. H. McBloome, of Santa Fé, N. Mex.

SANTA FÉ, N. MEX., *September* 3, 1879.

W. H. MCBLOOME, deputy surveyor, made the following statement:

I think the system we have at present is very simple and effective. The permanent stakes of stone or iron would last longer than the wooden stakes which are used at present, and would be very much better, but they would probably cost more. If it is desired to reach a remote point from one whose position is known, and it is not desirable to survey the county between the two points, triangulation can then be used to advantage. A much better grade of work would be done under the present system if the pay was better. There is not a sufficient amount paid for running the lines. I object to any change, because I think we are now getting the best possible survey for the money paid. It is simple and easily understood by the people. There are very few surveyors who run outside of the limits of error. We are allowed 300 links for error in townshiping and 100 links in subdividing. The surveying could be made more accurate by cutting down the amount of allowed error 50 links and by increasing the price for the work done.

Testimony of John C. Davis, register land office, Santa Fé, N. Mex.

UNITED STATES LAND OFFICE,
Santa Fé, N. Mex., September 2, 1879.

To the Land Commission:

My duties as register of the land office at this place has called my attention to the land laws and their workings, to the climate, water supply, and the different grades into which the lands of this Territory are naturally divided.

First. The greatest present want of the Territory is to have the private lands (which consist of Spanish and Mexican grants) segregated from the public domain, and to this end would recommend the immediate passage of the bill introduced into the Forty-fifth Congress known as Senate bill No. 376, limiting the presentation of claims to three years, and after that time forever barring them. This would leave the government 50,000,000 acres of land or more for settlement. This accomplished and a liberal appropriation for surveys we should get along very well with few exceptions under the present laws, but would recommend radical changes in the laws for the disposition of the public lands in this Territory, notably the repeal of the pre-emption law and the act of March 3, 1879, requiring notice and publication before final proof in homestead and pre-emption cases; would retain the homestead law with the pre-emption feature or right to commute, and increase the homestead privilege to 320 acres and allow any number of filings desired by the applicant, he each time surrendering his receipt with the proper relinquishment indorsed thereon, but would confine him to one final proof and patent. I would recommend the continuance of the desert-land act of March 3, 1877, as well adapted to these people and country, and the construction of the law should be liberal. I see no reason why a man should be compelled to irrigate every foot of a section of land, when it will suit his purposes better to use it as a grazing farm and introduce water accordingly.

Second. The physical characteristics of this Territory are such as to make a classification of the public lands a necessity; would recommend they be classed as arable,

irrigable, timber, pasturage, coal, and mineral lands; the arable lands I would dispose of in tracts of, say, 3,000 acres at 10 cents per acre; the irrigable lands, I see no reason they should not be sold at $1.25 per acre; timber lands I would sell in 160-acre tracts at $2.50 per acre; pasturage lands in unlimited quantities at 25 cents per acre. I am not prepared to say I would change the present coal-land laws. The mineral or mining laws should be greatly condensed and simplified; miners' camps and local customs done away with; a law so plain everybody could understand it, and all initial and other filings should be made in the district land office and nowhere else. The present area, 600 by 1,500 feet, I think ample.

JOHN C. DAVIS, *Register.*

Testimony of John C. Davis, Santa Fé, N. Mex.

(Copy of Senate bill No. 376, for ascertaining and settling private land claims.)

SANTA FÉ, N. MEX., *September* 2, 1879.

JOHN C. DAVIS, register land office, made the following statement:

Question. Have you any suggestions to make concerning improvements in the present method of surveying the public land?—Answer. I think there might be improvements made. I should heartily concur with the suggestion that we have an expert, a geologist, or any very competent man, with the survey and that the land should be properly classified and entered on the plats filed in this office, in order that the register might at a glance know just what kind of land there was in a township. As for these corners, I would suggest that they should be made of some very durable material and put up in such a way that settlers could find the quarter-section corners without trouble.

Q. Do you have many complaints on that score?—A. We have had a dozen men here who were at a loss to know whether they were on surveyed or unsurveyed land, and upon examination we found that the stakes had been destroyed. The result was that in order to determine where they were, they had to hire a surveyor at a cost of $10 per day.

Q. Don't you think that the forms now used in homestead and pre-emption cases could be immensely simplified?—A. I do.

Q. Don't you think that pre-emption proofs, that is the entry, could all be combined upon one sheet of paper?—A. Yes, sir; I do. I think the three affidavits could be put upon one sheet. I think also that the provision about speculation, &c., is all humbug. The pre-emption act, too, ought to be abolished, as the homestead has already a pre-emption feature in it. It would simplify the matter very much. The amount of homestead land should be increased. I would make it 320 acres.

I am decidedly opposed to the affidavits and notice of intention to prove up. I will show you an instance. Three Mexicans came in from San Miguel County, a distance of 150 miles, at a cost of $50 to $75 apiece, to prove upon their homesteads. I had to tell them, "There is a new law; you cannot prove up; you must send me a notice, and then you can give me $5 or $10 to pay the expense of printing that notice for five weeks, and then you can come back and prove up if there is no adverse claim." I do not believe that the affidavits or "notice" prevents perjury but increases it.

There is another thing I should like to speak of. We have plenty of cases on the books here where homesteads were entered in 1870, and they stand intact on the books to-day. I wrote to these parties but I could not get any response from them. I could not cancel them although there were people who would like to have filed on the land. I cannot cancel them even now till I get notice and know what they propose to do. They probably moved out of the county years ago but the land stands on my books as occupied. The probability is that half a dozen men have been on the land in the mean time.

Q. When you have the proof of the abandonment or relinquishment of a homestead you send it to Washington, do you?—A. Yes, and about a year from that time we get a return from Washington—the cancellation of the abandoned homestead. In the mean time the land is occupied by the person who has bought the home of the person who abandoned or relinquished it. That man ought to have the preference to anybody else and this is our ruling in the case of canceled homesteads, but that is not the ruling of the department. When the cancellation is made a certain time ought to elapse so as to allow the incumbent of the ground an opportunity to make his claim. Under the present law I must get a return from Washington before I can sell it. Now, I get a notice of cancellation; a man comes in here and makes application for entry on that land; I accept his entry but next week a man says I was living on that land before the cancellation was made and before that man filed on it, and he has never lived on it. In that case I should be inclined to think that the man who has lived on it should be entitled to the ground. But it is not law; still I think it should be so. I know of one

case in Washington where a cancellation was made and a man was living on the ground, but another man slipped in and made the entry, thus depriving the man who lived on the land from making title, and the department ruled in favor of the man living on it. I think the right to cancel it ought to be in the hands of the register and receiver as they are the persons best capable of judging, as they are right in the locality. I think, too, that the register ought to be authorized to go out of his office to take proof and testimony, especially here where the districts are so large. I had permission procured from the department to go down into Colfax County and it was of great convenience to the people. It is very expensive for poor men to come away here in order to make their proof.

In the case of pre-emption, settlers are allowed to prove up in six months, and they are also allowed thirty months. I think the register should be allowed to declare forfeited any pre-emption entry of thirty months' standing, the parties, of course, having received due notice.

Q. What good reason is there why a man should not file one-half dozen times until he makes at last a final entry and proves up?—A. None. I think a man ought to be allowed the homestead privilege until he finally makes a permanent homestead. There is no damage done if he does not consummate his claim. I think he should be allowed to file till he gets a home, for this is the object of the law.

There is a good deal of what we call agricultural land in this country, in our district. We have some fine rivers and bottom lands. There are large tracts of arable land that can be made useful by irrigation still left in this country all along the Pecos River, and in the upper portion of the country, in the San Juan district, there is as fine farming land as there is in the Territory. There is plenty of water. I am told that in the Animas Valley the settlers have filled up the township. Irrigation, of course, increases the bearing properties of the soil; at least it is said by those who pretend to know that it is equal to manure, and as an evidence there is land along the little Santa Fé Creek that has had a crop of corn every year for 100 years, and there is no diminution in its fertility.

Q. How much of the land in this district is pasturage land?—A. I should say that three-fourths of the land in this district is pasturage land, and about one-half of the total acreage of the Territory is in this district. If a man has 200 head of cattle he is bound to have 3,000 or 4,000 acres of land. Senator Dorsey owns all the springs on 160 acres, and this controls the whole 10,000 acres back of it. I think he would buy all the land if he could get it for 10 cents per acre. I think there is much of the land here that ought to be sold for 10 cents per acre. I would grade the land at 10 cents, 50 cents, $1, and $1.25 per acre. The classification on the maps would be the basis of this graded price. I would sell the pasturage land in as large quantities as the purchaser desired. If a man will take that land at any price you are pleased to name and put large herds of cattle on it, it is doing somebody some good, and perhaps there is no other way the land can be utilized. I think the men who are there now should be protected and have the first chance to buy land in proportion to their herds, otherwise the cattle men would be broken up. Twenty acres of land will do at one time and 30 acres at another time to support one beef. I do not think 30 acres too much as an average acreage for one beef.

Q. Do you favor the pasturage homestead?—A. Yes; I would be in favor of the pasturage homestead giving 3,000 acres to each actual settler. There are some water privileges left, and there is land with springs on them. I believe as Mr. Atkinson does, that the Mexican and Indian should be protected in their claims by making smaller subdivisions.

Q. What are your views in regard to the timber land?—A. I would sell the timber lands in limited quantities. I would not give any man over 160 acres of timber land, but divide them around; $2.50 an acre would be a fair price for timber land. I would protect the timber to the fullest extent possible. It would be well to make a limitation to the amount to be cut off, if you could enforce it; but I cannot see how you could. I would limit the quantity, that it might go to as many persons as possible. The registers and receivers in the various districts should have jurisdiction over the timber lands, as they have over every other class of land. He could stop depredations, &c., better than any one else. I think the law ought to be changed in that respect, and I think everything possible ought to be done to check the squandering and wasting of the timber.

Q. What suggestions have you to make concerning the mineral lands?—A. I don't know much about the mineral lands; but I think if a man has a mineral claim he ought to be allowed to follow the lode throughout its "dips, spurs, and angles." I think the register and receiver ought to receive the first filing of a mineral claim, and should exercise the same control over the mineral lands as he does over the other classes of land. In this Territory any number of men are allowed to make a mining district. I think that ought to be done away with. There ought to be one general, sweeping law regulating all mining matters. The present United States law allowing each man a mineral claim of 20.66 acres I think is sufficient.

Q. What have you to say in regard to sheep?—A. Concerning sheep, I think five sheep equal to one beef. Sheep and cattle men are conflicting all the time. Bloodshed often results, and I think there will be more of it if the matter is not settled. I think it would be decidedly to the advantage of the whole country if these matters are settled at the soonest possible day. Cattle men say that sheep ruin the country by running over the range ten times as much as they do. My observation confirms this opinion. I have known beautiful ranges of grass utterly destroyed by the treading of sheep.

Q. Can you suggest any improvement in the matter of water rights?—A. I do not see how the water-right matter can be improved. Of course a man should be compelled to return to the stream all the water he does not use. In regard to the land grants I would simply say that Senate bill No. 376, introduced at the third session of the Forty-fifth Congress, should be made a law at the soonest possible date.

Testimony of N. Gales, merchant and miner, Hillsborough, N. Mex.

The questions to which the following answers are given will be found on sheet facing page 1.

1. N. Gales, merchant and miner, Hillsborough, N. Mex.
2. Five years.
3. None.
4. I have had some experience in Minnesota.
5. Uncontested case two years.
6. I think the homestead and pre-emption law in its simplest manner as to entries and final proof is better than imposing so large an expense upon the *bona-fide* settler, as now seems to be the case. So large amount of proof papers, six weeks' advertising, &c., costs the settler money he is not able to bear, and but little good can result from this extra expense.
7. Mineral and pastoral lands.
9. I would suggest that no lands be surveyed except needed for use, such as the valleys for agricultural purposes and some lands that were needed around villages, which seldom are surveyed on account of smallness of tract.

AGRICULTURE.

2. September or October.
3. None.
4. One acre in 200,000.
5. Corn, wheat, barley, and fruits.
8. Richness has increased.
9. Very little water here.
10. All for mining purposes.
11. None as yet.
12. Nearly all.
13. Six hundred and forty acres to the settler.
14. Homestead only where it is not mineral.
15. Five acres.
16. One hundred.
17. About five.
18. About the same.
19. No fences; could be confined.
20. No.
21. Very limited.
22. Seven.
23. Diminished.
24. Not very well.
25. Very few here.
26. One hundred to one thousand.
27. I would suggest that the water courses be immediately surveyed, so men can improve their claims without infringing on others.

TIMBER.

1. Very little here; what there is is on the mountains.
2. No timber planted in this section; no agricultural lands, all mineral.
3. Cost more to survey the mountains than could be realized from the sales.

4. Only one class here; few pines in the mountains.
6. Fires will stop when the Indians are driven out.
7. Very little timber here; what there is is immediately needed for mining and building purposes; no unnecessary waste, only by Indian fires.
8. Custom is here to take timber wherever it can be found for actual use.
9. We need no law to regulate the cutting of timber here. I have no interest in any mill or the cutting of timber.

LODE CLAIMS.

I am interested in lode claims and think the laws are very good, which give general satisfaction here.

PLACER CLAIMS.

1. Gold mostly, some silver.
3. Without contest, $300; with, $500.

Testimony of William Krönig, farmer, La Junta, Mora County, New Mexico.

The questions to which the following answers are given will be found on sheet facing page 1.

Public Land Commission, Washington, D. C.:

GENTLEMEN: Having received a circular directing my attention to an act of Congress prescribing the duties of your honorable Commission and requesting replies to such interrogatories as may be within the range of my personal information, I comply with your request, and will give the most special attention to such questions as appear to me from my observation to affect this district particularly.

1. My name is William Krönig; occupation, farmer; residence, La Junta, Mora County, New Mexico.
2. Since 1849.
3. I have not.

AGRICULTURE.

1. The cultivated part of Mora County varies from 6,000 to 8,000 feet in altitude; the rainfall is the greatest in and near the mountains, where frequently irrigation is not necessary to raise good crops. The length of seasons varies with the altitude, and in the higher portion frosts in the latter part of August are not of uncommon occurrence. Our supply of water for irrigation depends upon the snowfall during winter and spring in the mountains, and agriculture without reservoirs is limited to the first and second river bottoms. The agricultural area can only be extended by a system of reservoirs, as, with few exceptions, there is hardly a season when we have a fair and sufficient supply of water for our growing crops.
2. We have frequently light rains in the months of March and April, but our rainy season generally commences in the latter part of June and continues in showers during the months of July, August, and September, and sometimes later. The rains do the greatest part of good to corn; for small grain they would be better earlier.
3. Only a small portion of the valleys and glades (situated in the mountains) can be cultivated without irrigation.
4. One-fiftieth part can be cultivated by irrigation.
5. Wheat, barley, oats, corn, pease, beans, tobacco, vegetables, and orchards.
6. The land in common seasons is thoroughly watered before plowing. When the wheat has spread out and covers the ground it is irrigated again, and the last irrigation applied when the wheat is in blossom. To give a correct estimate of the amount of water used is out of my power. To water 100 acres in this district a supply of about 160 inches (miners' measure) is needed for the first watering for fifteen days; to water the wheat it will take about twelve days, and the third time about ten days.
7. The sources of water come from our mountain streams, and the supply is altogether dependent upon the snowfall in the winter. The natural supply is in many seasons insufficient for the land now under cultivation, and only a proper system of reservoirs could increase the agricultural area. In this county we have now seven reservoirs, and if this system should be enlarged (facilities are not wanted) thousands of acres could be made to yield good crops. The evaporation is immense, and if the people could be induced to set out trees on the streams and ditches the supply of water would be considerably increased.
8. Irrigation has a beneficial effect on land generally, as the water contains salts in solution and also sediments from the mountains which serve as manure. In lands containing many salts (alkalies) irrigation will bring them to the surface and makes

them unfit for agriculture, but those are exceptional cases. Lands have been cultivated in this Territory for one hundred and fifty years and upwards without any manure, and their whole system of rotation consisted in planting corn one year and wheat the next, and still these lands produce very fair crops. Wheat is grown up to an altitude of 7,500 feet; potatoes and oats as high as 9,000 feet.

9. Each main irrigation ditch has a foreman, who gives out the water either to those who need it most or by rotation for days, or even for hours in seasons of scarcity. Each ditch empties at its terminus into the river, but it depends entirely upon the season as to the quantity returned to the river. Our local laws are very insufficient to give each landholder a just proportion of water contained in the streams, as those who live near the sources of the streams take advantage of the water without having consideration for those living below them.

10. It has been all taken up.

11. In dry seasons serious collisions among claimants.

12. Forty-nine-fiftieths.

13. In my judgment homesteads on pastoral lands should be divided into three classes. To those who locate on streams where only a small portion of the land can be irrigated, 320 acres should be allowed. Those who depend on springs, permanent water holes, or lakes, from which no water can be obtained for irrigation, should be allowed 640 acres. Those who live remote from any water course, springs, permanent water holes, or lakes, and where water only can be obtained by digging wells, should be allowed 1,280 acres.

14. Lands situated on water-courses, and subject to private entry, should be limited to a section to each purchaser in a square body, according to legal subdivision. On pasture lands remote from any water course, where water can only be obtained by sinking wells, one township.

15. It would take in this section 10 to 15 acres of pasture land to raise one beef, and I believe it would be a fair average of this Territory.

16. Sixty head.

18. Where cattle are only permitted the grass has held its own. Where goats and sheep are grazing, it has diminished.

19. Up to the present very little fencing has been done. Cattle ranging on the prairies in storms would seek shelter in timber and would break through any ordinary fence.

20. Cattle will do better on their accustomed ranges than to move them from place to place.

21. Streams, lakes, water holes, and springs.

22. Four sheep are equivalent to one beef in eating and destroying the grass, as they generally range in herds from 2,000 to 4,000 head.

23. Diminished.

25. A constant strife between the different owners, as cattle will not do well where sheep are herded.

26. I cannot answer the first question. Sheep are herded in bands from 2,000 to 4,000 head, and cattle from 50 to 3,000 head.

27. I am not familiar with this subject.

28. No.

TIMBER.

1. The timber lands of Mora County are about one-third area—pine, red and white spruce, piñon, white and red cedar, oak, cottonwood, and aspen.

2. None worth mentioning.

3. I consider it best that the mountain timber lands should remain public domain, as the agriculture of New Mexico depends upon the supply of snow which accumulates during winter and early spring, and if the mountains should be deprived of ther timber, which would be the case if sold, the snow, losing the protecting shade of the evergreens, would come down in torrents, and the water supply would be exhausted in the beginning of the season. In view of the fact that the greater part of the mines are situated in timber lands, limited amounts might be sold in lots of 40 acres, with a limited time for clearing. Due notices of a proposed sale should be published, specifying the location and extent, inviting bids for each lot of 40 acres, reserving the right to reject any and all bids for the same.

4. I would not.

5. There is a second growth of timber, but extremely slow.

6. The forest fires are generally caused by carelessness, and sometimes are started by Indians. There is a heavy penalty imposed by Territorial law, but I am not aware of any charges under the law. Miners and farmers use the public timber on public lands as common property, and there is not much waste from this source. Depredations committed in supplying saw-mills and cutting railroad ties have not come under my observation.

8. The local custom is to help yourself to what you want for fuel, fencing, and building purposes. The question of the acts of corporations I am not familiar with.
9. I think it would.

Respectfully, your obedient servant,

WM. KRÖNIG.

Testimony of William McMullen, civil engineer, New Mexico.

Public Land Commission, Washington, D. C.:

GENTLEMEN: Having received through the office of the surveyor-general of this Territory a circular directing my attention to an act of Congress prescribing the duties of your honorable Commission, and requesting replies to such interrogatories as may be within the range of my personal information, I will cheerfully comply with your request, and will give the most especial attention to such subheads as appear to me from my observations to affect this Territory particularly.

1. My name is William McMullen, civil engineer.
2. I have lived in the Territory since 1862—seventeen years.
3. I have never acquired, or sought to acquire, title to any of the public lands of the United States.
4. My impressions are formed from observations that have come to my notice while engaged as civil engineer, United States deputy and mineral deputy surveyor.
7. The surveyor-general's office can doubtless furnish the most extended and reliable information in reply, although the description given in the notes returned by the deputies who executed the earliest surveys in the Territory are in some cases very defective. I will hereafter refer to an instance.

AGRICULTURE.

14. In my judgment the lands put in market for private entry should be limited in quantity to each purchaser. It is a common practice in this Territory to enter the smallest legal subdivisions bordering on streams, with a view to speculation and to secure the public land adjacent thereto for grazing purposes without purchase. A notable case is that of Wilson Waddingham in his entry of land bordering on the Canadian River, and Ute Creek. See his advertisement hereto attached:

[Las Vegas Gazette.]

"Waddingham post-office, La Cinta, San Miguel County, N. M.; range, Montoy's Grant N. M.

"NOTICE.

"All persons found tresspassing by herding sheep or cattle on Ute Creek within boundaries of the mouth of said creek and for a distance of sixteen miles on both sides said creek, and also on Canadian (or Red) River from the boundary line of the Baca location No. 2 for a distance of sixteen miles on both sides down said river, will be prosecuted according to law.

"WILSON WADDINGHAM."

Another notable case is that of the private entry of land in townships 14 and 15 north, range 8 east, known as the Cerrillos mines. This, however, presents a different question. The United States deputy who executed the survey failed and neglected to report any mineral indications, giving only a meager discription of the same, although many old excavations for mining purposes were plainly visible at various points. A large portion of this land has been entered by different persons at private entry, and includes what is supposed to be the best mines. This has caused delay in developing the mines, and time only will reveal what other difficulties will arise therefrom.

28. Yes. This I will notice hereafter.

PRIVATE LAND GRANTS.

The prompt settlement of title to private land claims is a question of the utmost importance to this Territory. The delays attending the present system were stated in Congress last winter by Hon. Mariano Otero, our present Delegate. Unless some measures are adopted to facilitate a settlement of this question, the claimants or heirs cannot hope

to realize much benefit from their possessions; the majority are poor and unable to fee an attorney to prosecute their claims, and are therefore compelled to dispose of the greater part of their lands to obtain title to their small homesteads, or to sell out their claims for a mere trifle. This opens a field for capital to monopolize large tracts of the best land in the Territory. I might cite many reasons which present themselves to my mind why land monopoly should be checked, but it might appear presumptuous in me to do so; I will, however, remark that nearly all these grants are located on water courses and extend in many cases to the sources of the streams which rise in the mountains. The private claim of many miles on a stream of water from its source would be a serious obstacle to enterprise, which might seek to divert water from its natural channel to irrigate distant table lands or to prosecute mining operations. In my opinion, every facility should be afforded to enable the grantees or their heirs who are actual settlers to perfect their title without delay.

I would not be understood, in recommending increased facilities to grantees or their heirs whereby they might be enabled to retain their proportion of large grants, as making any exceptions to those who have acquired title by purchase.

The interest of the Territory, including all classes, demands a prompt settlement of title to private lands, and their segregation from the public domain, without cost to the claimants, as stipulated in the eighth article of the treaty of Guadalupe Hidalgo. Until this is done, settlement and improvement will be retarded.

Sales of private land by the government have caused hardship; also distrust of title to lands offered as public lands. This cannot be avoided until the private lands are segregated from the public domain.

The description of boundaries generally given in the title papers to private land grants are extremely vague and indefinite, and notwithstanding the most diligent investigation and thorough examination of testimony, the result is often obscure and unsatisfactory. Landmarks named or designated as boundaries, such as hills, springs, mesas, arroyos, &c., are sometimes found to constitute the boundary on a different side from that named in the description. The distances from point to point, as estimated by witnesses in proving title, are seldom approximative.

When the deputy surveyor enters into a contract to execute the survey of a private land claim he receives his special instructions from the surveyor-general, based on the record filed in his office, including a copy of the plat filed by the claimants or their representatives. As the records are known to be unreliable, the deputy is instructed to notify the claimants or their representative of the time when he will be prepared to run the boundary lines to the claim, and request the attendance of his witnesses to establish the same. The testimony of the witnesses is required to be taken before and certified to by a civil officer who is authorized to administer an oath; the deputy is required to establish the boundary lines on this testimony, his own observation of the boundary calls, together with the special instructions, and if any discrepancies occur in conflict with special instructions he is required to explain why the deviation was made. This is not always satisfactory to the surveyor-general, and I will add, nor is it to the deputy himself. Sometimes the deputy is instructed to return and change some part of the lines established. I entered a note in the general description of the survey of the "Cueyamungue grant," situated in Santa Fé County, which I executed under the contract of Griffin & McMullen, dated August 10, 1877, in which I comment upon the difficulty of complying strictly with special instructions. Your attention is respectfully invited to the same.

I would suggest as a remedy that a commissioner be appointed with authority to administer oaths and to compel the attendance of witnesses, whose duty it shall be to go upon the ground and to summon such witnesses as he may think proper, to identify the boundary calls of the claim and to file the testimony taken by him in the office of the surveyor-general, whereby definite instructions could be given to the deputy surveyor, and the approximate extent of the boundaries known.

I would also suggest that claimants or their representatives be supplied with a copy of notes or plat of survey on application to the surveyor-general, and the payment of the cost of copying. Without this information the claimant cannot determine whether he will accept the boundaries established or make an appeal for a change or correction of any part of the same.

LODE CLAIMS.

1. My information on lode mining is very limited, and confined to observation mostly in this Territory.

2. The principal defect appears to me to be the recognition of State, Territorial, and local regulations.

3. Such a case has not come within my observation.

4. The top or apex I understand to be the summit, comb, crest, or highest point on the ridge of a vein or lode. The top or apex, the course and angle or direction of the dip, cannot always be determined in the early workings of the veins or lodes.

5. The intended rights of a discoverer are not properly defined, and cannot be protected while local regulations control the conditions of location.

6. Yes.

7. No.

8. My observations have been confined to the early working of lodes.

9. I have not observed any outcrops of lodes wider than the legal width of claims as defined by these several authorities.

10. The outcrops of narrow lodes sometimes deviate so far from a straight line as to cross side lines which are run straight. The outcrop seldom extends throughout the length of a claim, and side lines are sometimes laid off on angles from float indications of the course of the vein.

11, 12, 13, and 14. From information gathered from Leadville miners, and from having read some of the decisions rendered by the courts, I do not feel justified in expressing an opinion on those points.

15. In this Territory on two occasions, viz, at the Moreno mines in Colfax County in 1866, and at the Cerrillos mines in Santa Fé County in March, 1879. To organize the Moreno mining district a meeting of the miners was held at Elizabethtown in compliance with a request of many miners duly circulated, which meeting was attended by about 40 miners. A committee was appointed to draft rules and regulations governing the locating and working of claims; also, to define the boundaries of the district. The report of the committee having been duly considered and adopted, a recorder was elected, who was required to keep a record of all miners' meetings, and to record all notices of mining claims presented to him for record, on the payment of a stipulated fee, &c. In a short time after the organization, in a dispute over a mining claim, one of the parties notified the other that a miners' meeting would be called at a specified time to decide the question. The meeting was held, and decided in favor of the original locators. The "jumpers" declined to accept the decision, and called another meeting, which decided in their favor, as many of the miners declined to attend a second time when they had already given a decision. It was then proposed to carry the case into court, and the party was advised that a suit could not be maintained, except through a lease of the title of the grant owner, in whom the title was vested.

The Cerrillos mining district was organized on the 27th day of March, 1879, at a meeting of all the miners known or supposed to reside in the district, some eight or nine in number. The rules and regulations, based upon the mining laws of Colorado, were proposed, discussed, and adopted after general discussion, and the boundaries of the district defined by the lines of public survey—townships 14 and 15 north, ranges 7, 8, 9 east. A recorder was also chosen, whose duties were defined in the regulations, viz, to provide the necessary books in which to enter the proceedings of all miners' meetings, the record of mining claims, deeds of transfer, and also to supply certified copies of the record on application of parties interested and the payment of a stipulated fee, &c. No other officer elected.

A few days after it appeared that a district had been organized within the limits of the Cerrillos mining district prior to the 27th of March, 1879, and called the Galisteo district. Each district ignored the existence of the other, and the Territorial law specifies that every mining claim shall be filed for record within ninety days after location, and that no other record shall be required.

16. The general method of locating a claim is to post a notice describing the location, giving the supposed course of the lode, and the distance from the notice claimed in either direction; also, the width on each side, the names of the locators, and the date of location. The record is a matter of after-consideration, and by some ignored entirely, those who claim that evidence of possession and continuous or periodical working of the claim in accordance with local regulations renders recording unnecessary. There is usually no time specified within which a claim shall be recorded under local regulations. Parties making locations with a view of speculation, or of selling their claims, secure a certificate of their locations by recording notices as evidence of their title, which is sometimes questionable. A local record is, however, advantageous for reference, that strangers and others may ascertain the situation, and who are the claimants and what are their respective interests. It is, perhaps, needless to say that the conflict between the Territorial laws and local rules and regulations creates much confusion.

17. I am not aware of any provision for amendment, Territorial or local.

18. No.

19. Yes.

20. Yes.

21. I "consider it desirable to retain the leading features of the United States mining laws," and I "believe that the practice of following the dip beyond the side line of a claim" can be satisfactorily maintained by drawing and defining the distinction between a lode and a deposit. I would favor a repeal of the authority delegated to States, Territories, and local mining districts, and embrace within the United States law the necessary details of locating and recording claims. The leading features of

the details I view as follows: 1st. What shall constitute a legal notice? 2d. How many days will be allowed to mark the boundaries, and in what manner they shall be marked? 3d. The time within which a vein or mineral shall be exposed and a notice of the location filed for record.

22. I would suggest that a possessory title be limited to three years, and that an application for a patent be admitted at any time within three years after an expenditure of $300 *in developing the mine.*

PLACER CLAIMS.

In my opinion placer mines are far more extensive in this Territory than most people suppose them to be. It would be difficult to form anything like an approximative estimate of their extent. They are but little sought for, as the scarcity of water precludes their working with profit. I am not aware of any lode claims or non-mineral land having been acquired under the placer law, and have no amendment to offer except to annul all local jurisdiction.

PUBLIC SURVEYS.

The theory of the system of public surveys under existing laws, as I understand it, viz, the extension of all "standard parallels" and "meridian lines" to be made from the "principal meridian" and the "base line," is unexceptionable. The exigencies arising from small appropriations to meet the demand of settlers located at points distant from the lines extended therefrom has rendered it necessary to resort to expedients to accommodate settlers, which mars the symmetry of the lines and involves questions, an instance of which I will hereafter refer to. The extension of the standard lines affords the means of ascertaining the general topography, geological formations, characteristics of the soil and products; without this information an estimate of the proportion of the various classes of land can only be a haphazard guess. It would also enable the surveyor-general to locate the most important subdivisions and the settlers at remote points to have their lands subdivided by making special deposits, as provided by existing laws. In this connection I may add that the segregation of private lands from the public domain is necessary to prevent the expenditure of public funds in subdividing private land. A glance at the map will show that many thousands of dollars have been expended in that direction.

The manual of instructions needs a thorough revision, which is doubtless well understood by the honorable Commissioner of the General Land Office. I will, however, recommend that the practice of establishing corners on prairie land by pits and mounds be discontinued. The mounds are often obliterated in a very short time and under the most favorable circumstances cannot be distinguished after a few years. A single stone of the minimum dimensions or a mound of stone should be substituted. Posts in mounds in timber land may be traced by bearing trees.

I would respectfully invite attention to the clause in the manual which leaves the responsibility of the legality of the special instructions of a surveyor-general on his deputy. (See case of Deputy William White under contract with Surveyor-General J. K. Proudfit in 1872.)

The surveyor-general should be responsible for his instructions and the deputy should be required to follow them. Also when a deputy closes lines beyond limits in connecting with old or previous work, he is required if necessary to retrace the old lines to discover the error. If the error is found in the old work there is no provision for compensation for this extra work.

The present rates are too low to remunerate a deputy who will do his work thoroughly. Expenses, cash at 18 per cent., risk of stock, delays on account of weather, and other contingencies, are apt to leave on settlement very little compensation.

May, June, September, October, and November are the most favorable months in the year for field operations.

Respectfully, your obedient servant,

WM. McMULLEN.

Testimony of George H. Pradt, United States deputy surveyor, Laguna, Valencia County, New Mexico.

The questions to which the following answers are given will be found on sheet facing page 1.

Answers to the accompanying questions of the Public Land Commission, under the proper subheads and numbers.

GENERAL.

1. George H. Pradt; Laguna, Valencia County, New Mexico; United States deputy surveyor.

2. I have lived in this county three years; in New Mexico seven years.

3. I have not acquired, nor sought to acquire, title to any of the public lands.

4, 5, and 6. I have not had experience enough on these points to give any useful information.

7. The Territory of New Mexico is an elevated plateau, with extensive plains, destitute of timber and water, but affording good pasturage; probably nine-tenths of the public lands are of this character. The mountain ranges, of which there are three systems, extending across the Territory north and south, are, with their spurs, all heavily timbered, except in the southern portion, and they comprise nearly all the timbered lands. The agricultural lands are confined principally to the valleys of the larger streams, though small isolated tracts occur in the mountains. The soil of the plains, however, is generally very fertile wherever water can be got for irrigating. Very little is known as to the extent of mineral lands, though minerals are known to exist in all parts of the Territory, and coal especially is very widely distributed. There is very little swamp land in the Territory.

8. I think the public lands can best be classified by requiring deputy surveyors, under the present system of surveys, to examine (in their township and subdivision surveys) carefully and minutely as to the character of the tracts surveyed, noting the different classes, the kind and position of the country rocks, the climate, natural products, approximate elevation, and to give any other information tending to throw light on the subject, and a description based on these reports could be furnished by the surveyor-general, including all the lands surveyed in his district during each year.

9. The present rectangular system of public-land surveys seems to be the best, on account of the cheapness and rapidity with which the work can be done, and because under it any parcel of public land, however small, can be readily found and identified from its number and designation. The surveys may be carried across mountain ranges by triangulation, and the subdivision surveys in very broken, mountainous regions should be so modified that the lines of survey could be taken through the valleys. Observations for latitude might be made at the initial point of surveys and at stated intervals along the principal meridian, base-line, and other standard lines, and where a telegraph line enters or crosses the district. Longitude stations could be established at one or more points. If increased accuracy in establishing township and section corners is desired, the limit of error allowed under present rules and regulations might be reduced one-half, for the improved instruments now in use will allow of such corners being established with much greater accuracy than is required by the laws. The subdivision of the whole of the public domain into sections under additional regulations and requirements would furnish the basis for a series of minute and accurate maps, at a very moderate cost and in a much shorter time than by any other method. I have been engaged in public-land surveys during thirteen years; also to some extent in railroad, private land-grant, and other surveys.

10. Pasture lands should be offered in larger quantities to actual settlers for stock purposes than under the present laws, and settlers should be allowed to locate irregular tracts of farming land where they occur among the mountains, instead of being required to locate in rectangular lots.

AGRICULTURE.

1. The climate of New Mexico is mild, with long summers and short winters, varying somewhat on account of differences in altitude. Rain is confined to the summer, the wet season usually extending from the 1st of July to the 1st of September. Spring opens in February, and is marked by strong, steady winds from the west and northwest and little or no rain or snow. The summer is long and hot, and bright, warm days, with cold nights, continue through the fall and until the middle of December. The winters are mild and the snowfall occurs in January and February, usually in small quantity. Water for irrigating is taken from the streams, swelled in June by melting snow in the mountains and in the summer by the rains.

2. Rain falls in July and August, sometimes in very heavy showers, and furnishes moisture sufficient for all crops for about two months. The rain comes at the time it is most needed, but not early enough for the best results.

3. Very little land in the Territory can be cultivated without irrigation except among the mountains, where the extent of arable land is limited to narrow valleys.

4. Probably one-half of the public lands could be cultivated were water for irrigation available, but the proportion that can be watered from existing streams and springs is small.

5. The crops raised in this vicinity by irrigation are wheat, oats, barley, corn, beans, melons, &c. Fruit-trees and vines are also watered.

6. Probably a ditch 2 feet wide and 4 inches deep, flowing 2 miles an hour, would be enough to water 100 acres of wheat.

7. The source and supply of water for irrigation is in the rivers and springs, and in many places reservoirs could easily be made, to gather the surface drainage during the rainy season in sufficient quantity for the needs of the dry season.

8. The water taken from muddy streams undoubtedly fertilizes the soil, and I do not think judicious irrigation is ever injurious. I have seen good crops of wheat, barley, oats, and potatoes, at an elevation of 8,500 feet, about the 35th parallel of north latitude.

9. Most of the cultivated land in this region is sandy, and there is a loss in the ditches and in watering the fields of at least one-half the water used. The whole business of constructing ditches and irrigation and the care and distribution of the water are under the Territorial and local laws and regulations.

10. Water has been taken out along all the streams of any size, under the Territorial and local laws and under the supervision of ditch overseers, who are chosen by the people of the several precincts.

11. Conflicts sometimes arise when parties on the upper part of a stream use more water than they are entitled to or waste what they have taken out, causing a scarcity below.

12. In its present condition, without wells or reservoirs, about nine-tenths of the public land is fit only for pasturage.

13. I know of no reason why *pastoral* homesteads should not be allowed, with the privilege of locating, say, one-fourth of a township, or between 5,000 and 6,000 acres.

14. These pasture lands should be put upon the market as fast as surveyed and sold in large quantities for stock purposes.

15, 16, 17, 18. I am not sufficiently acquainted with the stock business to give reliable information on these points.

19. Cattle raisers do not fence their ranges, but cattle could be safely confined by fences at all seasons.

20. The quality of the herd would undoubtedly be improved by being confined to a certain limited range.

21. Stock water is obtained from springs, wells, and reservoirs.

22. I think one sheep will destroy as much grass as one beef.

23. Grass in the country has diminished or disappeared wherever sheep have been herded, and a considerable part of the public lands have been ruined in this way.

24. Neither cattle nor horses will graze after sheep.

25. Owing to the destruction of the grass by sheep, cattle men always try to keep them away, and quarrels often arise.

26. Valencia County contains about 250,000 sheep and perhaps 40,000 cattle. Sheep are herded in flocks of 2,000 to 3,000 and cattle in bands of 200 or 300.

27. The public lands ought to be surveyed as soon as possible and classified, so that depredations on timber lands could be stopped and for the convenience and benefit of all who are looking for locations on the public lands, as farmers, stockmen, miners, &c.

28. The corners of surveyed lands in this vicinity are all perpetuated by stone monuments and there is usually no trouble in finding any of them, though they are sometimes destroyed by sheep-herders. I have found and identified public-survey corners in this region that were established more than twenty years ago.

TIMBER.

1. The timber lands of this county lie in the western part, and cover about one-third of the public lands of this western part. The great bulk of the timber in the mountains is yellow pine, and the foot-hills of the mountains are covered with a very extensive growth of juniper and piñon, generally only useful for fuel.

2. No timber is planted in this section.

3. Public timber lands might be leased for a limited number of years, and the cutting of timber on such leased lands controlled by regulations to prevent any portion from being entirely denuded.

4. It would be unnecessary to classify timber lands in this section, except so far as to distinguish that which is valuable for manufacturing purposes from that which is only fit for fuel.

5. When forests are felled or burned, a growth of aspen or scrubby oak, or both, springs up, and after several years, when they have attained sufficient growth to afford shade and shelter, the pines again start; but they are of slow growth, and some mountain slopes that have once lost their large timber remain permanently bare, and I am satisfied that diminished rainfall and failure of water in the springs result.

6. Forest fires are started by herders, through carelessness or to burn the dry grass, and by wandering Indians, through mischief or to drive the game together. These fires occur every year in all parts of the Territory, and sweep over extensive tracts, causing irreparable damage. A careful oversight and frequent inspection of forests would no doubt prevent the greater part of this destruction.

7. In this Territory the depredations on timber so far have been confined to a few saw-mills of small capacity, and some little cutting of timber for mining purposes;

but the extensive cutting of timber for railroad ties or fuel for locomotives, or for mining or building purposes, causes great waste, and should be regulated by national legislation, and the necessary laws enforced by appropriate penalties for these depredations.

8. In this section timber is cut wherever it is most conveniently found, and felled timber is always considered the property of whoever cuts it.

9. The timber laws would, in my opinion, be most efficiently executed by officers connected with the respective district land offices, and a sufficient number of such officers should be appointed in each land district to keep up a constant oversight of all the timber lands.

LODE CLAIMS.

1. I have made preliminary locations of lode claims, but know very little about mining or litigation about mines.

2. There are in some parts of the mining laws apparent ambiguities that are taken advantage of to make litigation affecting titles, and many quarrels and lawsuits result.

3. After a survey of a lode claim has been approved and placed on file, no subsequent survey should be allowed to infringe upon it, except after a contest in proper form has been carried through, an adverse decision rendered, and the first survey canceled.

4. I understand the top or apex of a lode to be the upper edge; that part which is first reached or passed in developing the mine. Often the apex cannot be found throughout the length of the claim, nor the course nor dip of the lode determined except after very extensive and costly explorations.

5. It does not seem that the intended rights of the discoverer are as clearly defined as they might be by the mining laws.

6. I have heard of numerous cases in which litigation and injustice have sprung from the impossibility of determining these points.

7, 8. I have heard of such contests, but not how they resulted.

9. I do not know of any such instance.

10. Such is often the case where the side lines are required by local laws to be straight.

11. Locations may be made of alleged lodes on non-mineral ground, to secure the monopoly of a water supply or of ground suitable for building, causing injury to *bona-fide* locators.

12. I have heard of repeated cases like that of A and B, in which A's title was clouded and he put to expense and trouble.

13. So far as I can learn these cases are very frequent.

14. From what I have learned of mining operations I do not think it posible to retain in the mining laws any provision by which locators can follow the dip of their lodes outside of their side lines without constant disputes. Two men will often locate separate veins near each other that, upon being followed down, will run together, making one vein under the surface, and one locator will claim the consolidated vein by priority of location, while the other claims that *his* vein is the true lead and the first only a feeder or spur.

15. I have assisted in organizing a local mining district near the Pueblo of Laguna, Valencia County, New Mexico. About twenty men participated, not *necessarily* miners. The officers elected were a president, to call and preside over meetings; a secretary, with the ordinary duties of secretary; a recorder, to keep a record of all location and transfers of claims and to issue certificates of records, which were proof of title: and a marshal, to enforce the district laws and rules.

16. In locating an original claim, the locator posted a notice at the point of discovery, stating the time of discovery, direction, and distance claimed from discover stake, and within thirty days marked the boundaries of his claim by stakes at the corners, and had the claim recorded, receiving a certificate of record.

17. The record could not be subsequently altered, and the certificate, embodying a copy of the record, was a check against fraudulent changes in the record boks.

18. I have not known of any such cases.

19. It would be advantageous in my opinion to abolish all local mining-district laws and records, and have the initiation of record title placed only with the United States land officers.

20. The adjustment of all questions and contests touching mineral lans should be left to the proper federal officers, and not to the courts.

21. In view of the constant litigation under the present laws, a locator ould be allowed to claim only what is included within the planes drawn perpendicularly downward through both *side* and *end* lines of his claim.

22. A locator should be obliged to acquire title within three years. Under the present laws a mine can be held by a possessory title, worked out as far as possible, and abandoned.

PLACER CLAIMS.

1. There are no placer mines in this section.
2, 3, 4, 5, 6, 7, 8, 9. I have had no experience in placer mines, or in the operation of mining laws governing the location of placer claims.

LAGUNA, VALENCIA COUNTY, NEW MEXICO, *October* 23, 1879.

Testimony of George H. Pratt, Santa Fé, N. Mex.

SANTA FÉ, N. MEX., *September* 2, 1879.

GEORGE H. PRATT, United States deputy contract surveyor, made the following statement:

I consider the rectangular system a very good one. I do not know of any way it can be improved, except in the way of accuracy. In subdividing townships into sections an error of one chain is allowed in the length of a mile, and an error of 3½ chains is allowed to three townships. If increased accuracy is wanted I think that allowance might be cut down. I think it is too great an allowance. I know that surveyors come far within these limits in making their surveys.

Question. Cannot most of the deputy surveyors run a solar transit?—Answer. Yes, and most of them do.

Q. Have you any suggestions to make as to triangulation?—A. I think the use of triangulation for the purpose of passing over barren spots or mountains is a very good thing. I was just looking at a case on the map where the cross-line was traced some 120 miles, and about 70 miles of it was not located on the ground, on account of the rough country. It was located by making transverse lines—in some instances 12 miles—with the compass and chain. It was utterly impossible to locate points with the accuracy of triangulation. I think time monuments would be very desirable. They would be very useful for reference, and would make greater certainty in the survey than now exists. It is also desirable to have permanent stakes. Wooden stakes soon decay. They will last for five or ten years if the cattle do not knock them down. Stone monuments would last much longer. I think it would be well to have permanent monuments at every fourth township corner. Owing to the loss of the corner posts resurveys have frequently to be made, at great expense to the settler. If permanent monuments were there the settler could walk north, south, east, and west and find the boundaries of the land. I think that the principal meridian and base and correction lines ought to be established with greater care, and the initial points determined astronomically. I do not think deputy surveyors are paid enough to prevent them hurrying through their work in order to make more money, and the result is a poor class of work and a great deal of inaccuracy. My experience in mining surveying has not been very great, but I think that endless litigation would be avoided by the square mining location. The amount of land allowed in the United States law is sufficient, and I think that all local mining laws should be abolished and the United States law used instead. I think it would simplify matters very much to have everything relating to mines in the hands of the registers and receivers, and I can see no good reason why the government should not hold on to its mineral lands as well as its agricultural land.

Q. Is there much mineral land in this Territory?—A. Yes; there is a great deal of mining land here. I have seen great areas covered with quartz; and there is a great deal of coal here too.

Q. What do you receive for surveying?—A. I have surveyed in Arizona, Kansas, Indian Territory, New Mexico, and California under the United States system, and we receive $6 for subdivision, $8 for standard lines, and $10 for meridian lines. I do not think that is enough, to do it as it ought to be done. We use monuments of stone, with chisel marks cut in them. The chisel marks are required by law. Most surveyors prefer to use stone—though they can use stakes if they wish to—because they are more permanent. I have retraced lines run twenty-five years ago in this Territory, and there was no difficulty in finding the corners where they were marked with stones. The only cost of these monuments is a man and chisel.

Q. Do you use the solar compass?—A. Yes; we use the solar compass. It is generally used in the Territory by the deputy surveyors who take contracts; but no man uses the solar compass all the time. I would not use any other, however, on such surveys as these.

Q. On the score of cheapness, which would be best, the present system or the one of establishing these corners by triangulation?—A. I think there is no doubt that the present system is far cheaper than to establish them by triangulation.

Q. What have you to say of the timber lands?—A. All the timber lands here are

being destroyed, a great deal by persons who come in with saw-mills. I think the timber lands ought to be put under the jurisdiction of the register and receiver and some effort made to protect the timber, for when the miners go in they will sweep the timber from all the mountains in the Territory in a few years, as they are doing in Colorado; and, as the growth is slow, it will take a long time to replace it.

Testimony of W. G. Ritch, Santa Fé, N. Mex.

SANTA FÉ, N. MEX., *September* 3, 1879.

W. G. RITCH, secretary of New Mexico, made the following statement:

I am very much of the opinion that the general land system of the country, as known to the country at large, is not applicable to the land west of the 100th meridian. If the man that is here finds a spring that is capable of maintaining 5,000, 10,000, or 15,000 head of stock, he buys 40 acres of land, and then he has a monopoly of the whole range because he owns the water. I think, as a matter of fact, that the water should belong to the United States—to the land—and not to the individual; but it is impracticable as far as this country is concerned. If he buys the spring he must buy a certain amount of land surrounding. The quantity of land, by some fixed rule, should go with the necessary quantity of water, as far as determined, flowing from that spring. I am inclined to believe that most of the water rights are already taken up. I think it would be well to sell this pasturage land in large tracts to the cattle herders, as they are of little value except as owned in large tracts. They should, of course, have some limit to them. I do not believe in land monopolies. However, taxation and our system of government reaches these things generally very well. I should say this land ought to be sold at a nominal cost. Certainly very much of it is not worth more than 10 cents per acre. In putting it at 10 cents I would have it carefully restricted. I should classify it very carefully, and make a difference in the different kinds of land. If a man bought land with water on it, a certain amount of arid land should go with it. It is very possible that the old land system in this country is better than the new. If the homestead principle applies in the case of agricultural land, I see no reason why it should not apply in the case of pasturage lands. If the rule applies to agriculture it will apply to stock-raising. I think 3,000 acres would be sufficient for a pasturage homestead. There is no doubt about it, this question ought to be settled as quickly as possible. There is no doubt about that at all. As it is now you are simply breaking up the country by protecting a sort of baronial system by reason of these enormous herds of stock holding great sections of country, which, perhaps, they would not hold if they bought the land and fenced it in. I look upon the present system that they have here as simply calculated to continue indefinitely those troubles which we have had in Lincoln County. The troubles in Lincoln County arise out of its being almost a remote section, outside of taxation. Lincoln County is in the southeastern quarter of New Mexico. We all know something about the character of Western Texas. Each man is a law unto himself. He is a standing army, with a small arsenal on his person. He is a private arsenal, and must necessarily be so by reason of the remoteness of the ranches. They are many times 20, 30, and often 50 miles away from any other ranch. Its location is governed by water holes. These people have gathered here from Texas as a rule, and as it is too often the case they are outlaws from other States. They get to fighting among themselves, and they swarm out and come into New Mexico, and the annual outlet for them is to follow the valley of the Pecos River up into Lincoln County. They are there made use of by the owners of large herds to drive the small owners away. The tendency is for the strong to overpower the weak, and that results from the fact that these lands are held loosely and not purchased. They get possession of the water right, and hold all the land around it. That was how the revolution of last year was possible.

I think that the more you can break up the baronial system the better it would be for the country. If we are going to promote civilization in New Mexico it is absolutely necessary that we should break up this system, whether it is by owning the water in fee or by simple squatter rights. You must, of course, regulate it so that no one man can own the whole section. I think the chances are for a great number of cattle with small owners, rather than large owners. I think there are a large number of small ranchmen that would take up herds of cattle. The situation is this: you want to have just as many people in the country as possible. You want a land system that will induce the greatest number of people; that will be land owners, ranchmen, cattle owners, or whatever you may choose to term them. I think I would sell this land at public auction or private entry at a low rate. I am inclined to think that the pasturage homestead entry is a good thing.

There is such a thing as getting water by digging wells and putting up windmills, and other pumping apparatus. There is something in the land system that allows a

man by doing a certain amount of work to acquire a certain amount of land. Might it not be possible to apply this principle to these pasturage lands, regulating the amount of land given by the amount of water he secured. It might be necessary to clear up these arid belts where they are 50 miles away from water to make the quantity of land given larger. That might induce aggregation of capital.

I think it would be well for the general government to conduct a system of experiments in regard to artesian wells. I think that might with propriety be made part and parcel of the geological survey. I think it is economy to do anything and everything you can to increase the population.

I am inclined to think that the old civilization here has no very great love for the new. There has been progress in the country, moral and otherwise. There used to be a time when priests would go into a bar-room and get a drink like any other ordinary mortal, but now they don't. You see screens in front of the doors now, and no more gambling in the public places. I think the Pueblos are the most industrious of the native population.

Testimony of Trinidad Romero, Las Vegas, N. Mex.

LAS VEGAS, N. MEX., *September* 5, 1879.

HON. TRINIDAD ROMERO (ex-member Forty-fifth Congress), sheep and cattle owner, made the following statement:

I am well acquainted with the lands in New Mexico. A great portion of it is pasturage land; only along the streams is it fit for agriculture. Much more could be cultivated if there was water. The future industry of the country is to be stock raising and not agriculture, though it may become a fruit-raising country, and that will pay better than wheat and corn. We raise very good fruit now, such as grapes, peaches, apples, apricots, plums, pears, &c., and most all kinds of vegetables, along the streams. There is not much frost to destroy fruits and vegetables; and then we have dew.

There are very often conflicts between sheep and cattle men. The cattle men are of the opinion that sheep destroy the grazing. If these lands were parceled off for sheep and cattle men there would be no difficulty. My stock ranch is near Fort Bascom. I have about 40,000 head of sheep and 5,000 head of cattle. There is no trouble, because they are kept apart; the sheep grazing on the hills and the cattle on the bottoms and in the cañons. I have never had any trouble, and if this method was carried out there would be no difficulties.

If these lands were fenced it would be much better. In that case you could have the sheep and cattle separate. Wherever the sheep men turn their sheep on the cattle ranges there is trouble. The cattle go away and the sheep tramp down the grass. I think that 30 acres of land can sustain 10 cattle the year round. I think if you put 30 acres under fence and put in 10 beef they will be sustained. Taking a range, I do not know but it would take a much larger amount. About 10 sheep is equivalent to one beef. That is, 10 sheep could be grazed where 1 beef could be grazed.

There is plenty of water in my region. I am down on the Canadian River. The water rights are not all yet taken up. We have no trouble for water, there is plenty, and the country is not yet overstocked with sheep and cattle; there is room for plenty more yet.

Question. Have you any suggestions to make as to the disposal of this pasturage land?—Answer. My idea about that is that it is not a good policy for the government to sell the land, for then great monopolists might get hold of the land and do as they please with it. I think it would be well to dispose of it in pasturage homesteads of 3,000 acres to each man, at a low rate, at 10 cents per acre, on condition that he put up a house and cultivate in timber 5 acres of land, and the government could then give him a patent to that land. That would be an inducement for people to settle all over the country. I think the present homestead and pre-emption system is not adapted to this country.

I am 110 miles southeast of Las Vegas, and at about 3,000 feet altitude, which is much lower than Las Vegas. You can obtain water there in some places at 10 feet, in other places 20, 30, and in some places you have to go as deep as 100 feet. I think the policy of giving each man 3,000 acres would build up the country very fast, but I would not advise selling it in large unlimited tracts, because then monopolists would get hold of it. I think it would be a good thing to allow each man to have his pasturage homestead, and then allow each man to take as many additional acres as he has head of stock at the time of entry or purchase. The actual settlers should be protected with their bands of stock.

I think it would be very unjust to do anything that would destroy the homes of the Mexicans along the little streams. Many of these people have lived there years and years, but have no title to the land, and very little money. I think it ought to

be so arranged that the rectangular subdivisions should be made smaller, so that the Mexicans could get their small irrigable strips along the streams.

Irrigation improves the soil year after year. There could be ten times more than what there is now if ditches were dug and the water properly stored and saved. The rainfall has not increased for the last ten years, but, on the contrary, the streams are falling behind. I know this from others, and my father tells me so. There are many dry streams now that at some past time were full of water. The best irrigation districts are along the Rio Grande, Pecos, and Canadian Rivers. I do not think New Mexico will ever be an agricultural country to any great extent. I think it will have to rely on mines and stock raising.

The timber lands have not yet been injured much, but when the miners come in they strip the hills of the timber. There is good timber from the timber line, which is at 1,200 feet, up to 6,000 or 7,000 feet. I think the whole subject of the destruction of timber could be best attended to by turning it all over to the register and receiver of the district land office.

Concerning mineral claims, I think that they ought to be square; that would stop all disputes that have arisen from not having such a law. We are just beginning to develop our mines, and the subject ought to be taken in time. The whole subject of mining titles should be placed in the hands of the register and receiver of the district land office, as in the case of agricultural and other lands, so that the government can keep track of mineral titles from their inception until the patent issues.

Q. How many sheep, horses, and cattle are there in the Territory?—A. I think there are between 5,000,000 and 8,000,000 sheep in New Mexico, averaging from $1 to $1.50 each. There are about 500,000 cattle in the Territory, valued at about $15 per head, and 200,000 or 300,000 head of horses, varying from $20 to $25 per head.

The average price of wool is 10 or 15 cents per pound. Some of the wool is washed and some not. Each sheep averages two pounds of wool. I think 30 acres will support ten head of cattle, if fenced; I mean, of course, average land. That is my experience. I live four miles from Las Vegas, and I have there fenced in about 1,000 acres of land, and pasture some stock there—sheep and cattle. Then in the winter time I always have about 200 or 300 sheep, besides about 200 head of horses and cattle, and that keeps them first-rate. That is, I mean to say that 1,000 fenced acres of hill and bottom land will keep 500 head of stock, sheep, horses, and cattle.

I think it would be well to allow 3,000 acres of land as a pasturage homestead, because that would give the people room enough, and, as wells would often have to be dug (sometimes at a depth of 300 feet) they would not dig them for a less amount of land. If it was 1,000 acres some people would not dig wells, on account of the expense, which is often quite heavy. I would make it one of the conditions of a pasturage homestead that the settler should bring water on the land and improve it by trees, and at the end of five years I would give him this land, if there was water enough to supply five hundred head of stock.

Q. Are not people prevented from coming into the county by reason of the cloud on Mexican title?—A. Mexican titles are good but the land has never been properly surveyed. The government ought to provide for surveying these grants and then the people would know exactly what they are about. The way they are now the people are afraid to take them up. They do not know whether it is public land or in the Mexican grant; and I would have these lands honestly surveyed and then require that the persons holding these claims enter them within one year after the survey is made, and if they did not do so, then the land should be forfeited to the government. I think that Congress ought to confirm those claims that have already been proved up and presented to Congress for confirmation. This grant question ought to be settled at once, as well as the difficulties in Lincoln County, which are caused by the inroads of persons from Texas. If there were permanent titles to the land I think it would tend to settle all such difficulties.

I think I would sell the timber land right out at $1.25 per acre, allowing it to be taken in limited tracts. Saw-mill men could then buy the land from other parties.

The greatest need we have is people, but we want good, enterprising people.

I think there is an imperative necessity for the government doing two things:

1. Dispose of the land at the cheapest price, under proper restrictions and conditions.

2. Confirming at once and settling the titles to these Mexican claims.

Testimony of William White, Santa Fé, N. Mex.

SANTA FÉ, N. MEX., *September* 2, 1879.

WILLIAM WHITE, deputy surveyor, made the following statement:

Question. How long have you been a deputy surveyor?—Answer. Off and on since 1872.

Q. You have heard the statements of Mr. Pratt, do you concur in what he says?—A. Not entirely. I do not see any use for this extremely accurate and expensive survey of the public lands by triangulation. It is simply the purpose of the government to put the land in the hands of the people, and the land is now surveyed with sufficient accuracy for all practical purposes. When the government parts title to its land, as in Illinois and Missouri, it no longer has an interest in them.

Q. Have you any suggestions to make?—A I saw among other objections to this system of surveys a complaint made that there is not sufficient information with regard to the altitudes and the formation of the earth's surface, contours, &c. I would suggest as regards that that a great deal of information could be given by obliging the deputy surveyors to carry one of these ordinary pocket barometers in the field and note the elevations and depressions of the land as they pass over it. Of course, the altitudes thus obtained will not be extremely accurate, but still they would give a great deal of useful information and be sufficiently accurate for general purposes. I would suggest, too, that he carry a thermometer that could be read, and there you have a check on this whole system of observation throughout the extent of the public surveys. This taken together with the reading of the barometer would cost hardly anything, and be of great use. These instruments could be the property of the government, to be taken by the deputy surveyors and returned to the surveyor-general when done with.

I was spoken to this morning about the question of making an alteration in the price of public land. My opinion is that it is very much to the interest of the government to go very slowly in that matter. This thing of determining what is arid, worthless land seems to be very simple, but it is not, because it is altogether governed by circumstances which you cannot foresee. Valueless land to-day is settled, cultivated land to-morrow. Land that is slimly populated men will not look at, but when densely populated it is cultivated and valuable. I think that this call for this great reduction in the price of land, and to sell large tracts of it which are now regarded as valueless, comes from swindlers who want to buy it very cheap and sell it very dear. It comes also from men who own large herds of cattle and sheep, and, of course, who like to get hold of it for little or nothing, so that they can subsist their animals upon it. So far as delay is concerned, it does not hurt these men who own the cattle; they are now grazing free of cost. I think that ought to satisfy them. It would be better to lease this land to them for a term of years. I do not see the necessity of sacrificing large tracts of land, selling it now and getting very little for it, whereas in the course of years this land will be very valuable. They are constantly finding out that water can be obtained in one place and another. Right in this town there is land which was supposed to be valueless, and it is now found that it can be cultivated with water. I do not think that all the water in our country is yet known. There are also very large tracts now claimed as worthless that in course of time will be valuable by means of water.

Q. Don't you think there should be some classification method adopted for defining the kind and character of the land which the deputy surveyor returns on the map and field-notes?—A. More information, I suppose, could be obtained in regard to this point by greater accuracy of surveys.

Q. Suppose you had a geologist, would that help you any?—A. Yes, I think it would materially. If the pay for subdividing was better you would then have a better class of work.

Q. Do you not think it would be better to have one general United States law that would regulate all mining matters?—A. Yes, I think it would.

Q. Don't you think that the register and receiver, or by deputy, should have the first inception of mineral titles, and that it all should be in the land office and not in the office of the local recorder?—A. I think that would be very much better, for the reasons that the other gentleman stated.

Before closing I should like to say again that I do not believe it to the best interest of the government to sell these lands in large tracts, and that it should be done with great care if it is done at all.

Testimony of Chas. M. Rolker, mining engineer, New York.

The questions to which the following answers are given will be found on sheet facing page 1.

NEW YORK, *November* 6, 1879.

Public Land Commission, Washington, D. C.:

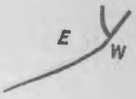
SIR: The editor of the Engineering and Mining Journal has given me a copy of your printed questions, with a request to answer such as I am personally familiar with, and I will answer *seriatim* the questions on "lode claims" as far as I can speak from personal experience.

1. I am an educated mining engineer, studied in Europe (Clausthal School of Mines) and in this country (New York School of Mines). I have followed this, my specific business, since 1868. I have seen and examined the principal German metal mines, and examined the following districts in this country: the New Jersey iron and zinc mines; Pennsylvania—Wilkesbarre, and Scranton coal regions; the Wisconsin lead mines; Lake Superior iron mines and copper mines; the Mariposa County, California, gold mines; the mines of Story, Lyons, and Ormbsby, Washoe, Echo, and Elko, and the Eastern Nevada mines. The Nevada mines have come under my observation for an uninterrupted period of over two years. Aside from professional examination in these districts for individuals and stockholders, as commissioner I have been in charge of the Mariposa estate, and directed prospecting operations in Washoe County, Nevada, and am at present on the point of starting for Silon Reef, Utah, to direct the workings of a New York company, the Stormont Company's mines and mills.

2. Overlapping should not be allowed in locating claims, as it will always give rise to lawsuits and blackmail claims as soon as either claim is coming to the front as a paying proposition. I have had difficulty myself in Peavine district, Nevada, which, however, resulted in no lawsuit nor fighting, simply because with the larger number of men at my command I simply removed the monuments as soon as erected; and lawsuits would not be brought because men no doubt had not sufficient confidence in their claims to risk their money in suits, and also because they knew, well backed as I was with money, that litigation would be costly. Among individual prospectors of the same financial caliber frequent troubles arise by one party starting a shaft, &c., in the overlapping ground. Rigid laws should be passed to prevent future swinging of claims by forcing the district recorder to survey each claim in person (so he can not depute the locating party), to fix the monuments, to keep in ONE book of survey records the bearings of these claims' end and side lines, and that afterwards it be entered on the district plat, say within thirty days of day of location. Have such in express terms of United States laws expressed, and let a claim not placed on *record* in such or similar manner be forfeited. The locator shall locate in the presence of the recorder, and at that time the district recorder shall survey it, the claim, in person, or by his lawful deputy recorder appointed at the annual meeting in advance, but no other person shall be qualified. The deputy recorder shall place the monuments, 6 in all, 4 corner and 2 center monuments, and it shall be unlawful to overlap ground once located. On the posts have the name of the claim and locator and day when located. Such having been complied with and the recorder stamping with his seal (rubber stamp) the corner posts, a certain fine should be fixed for any one meddling with, changing these posts, or its equivalent in imprisonment. Now it shall be the duty (under penalty of $——) of the recorder to enter such claim and its notice of location just as of old on the record book within twenty days of day of location, and on the district mine plat within thirty days after location notice. The stamp on the posts is sufficient warning to others and the fine imposed on the recorder to comply with the law. It shall be against the law and subject to fine of $—— (bondsmen always can pay up) to keep more than one book of locations or survey records at one time, and no new book shall be used until the first is full. This abuse prevails in the West; say three books of record are run at the same time. A locates on the 3d at 11 a. m.; B on the 5th at 1 a. m.; C, a friend of the recorder, locates in reality, as it now goes, on the 20th the same claim, or drives old-looking posts somewhere near the tree monuments; he claims the wind blew his notices down, and tells A he jumped his claim unlawfully. They go to the recorder, he turns to the other book in which neither A nor B are recorded, but kept for such occasions, and turns to a page, and A finds, although in reality he located prior to C, still that the records show, say, he located on the second at night. The records condemn him, and C has still time to the 23d to do his two day's work, as many local regulations require that to be done within twenty days after location. As such A, the rightful locator, is defrauded. Sometimes pages are kept blank for similar purposes. Such acts of the recorder, for which he generally gets $20, sometimes a drink, should be punishable by a fine of at least $500, and imprisonment besides. Hard as it may seem, I know of such practices. Were such a law in force the late bloodshed in Borie, about the Jupiter and Owyhee claims, would have been avoided, as one generally known scandal, and many a quiet row would be avoided. Not too much care can be exercised in the first locating and getting the records clear, for it is the foundation to the future successful structure dependent on the good mine.

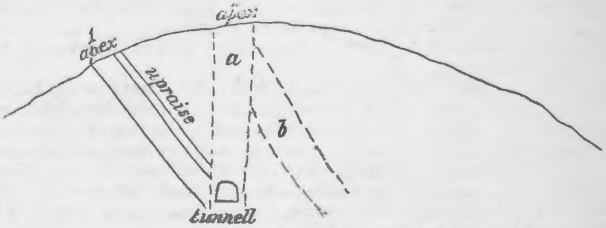
4. The top or apex of a lode is the outcrop (*a*), or, in case of a blind ledge, that line of the vein or lode which approaches the surface the nearest. In some cases, it is impossible to determine dip of lode in early workings, and often, if many ravines and hills traverse the country also, its course can only be inferred from the supposed action they had on the course of the vein. For the dip I simply quote you the Comstock lode, which in force

dipped west (one of its branches), and it was also ore-bearing in the western dip, and only when reaching the eastern dip, at about 300 feet depth, parties found out that what appeared as an immense fissure proved to be in reality a spur. In the Union Consolidated, in Southern California, this change of dip only occurs at 700 feet (nearly) depth. Until they struck this dip, changing into the opposite direction, no one dreamed the lode ever would turn. Then you have lodes, not side or companion veins or spurs, which on gaining depth come outside of the reach of surface shoo-ings, if I may say and assume the general country dip. Now, this may take place at such depth that early workings cannot determine the true dip. Often, yes, very often, in regular and less disturbed country, it can be determined, but not always. Or take a ledge dipping as I found one in Peavine district, dipping above 82°, then 60°, then 45°; and its final dip was 22°, after attaining 265 feet vertical depth. In the same district I found the change from eastern to western dip due to the action of country rock. Such is liable to occur frequently in zones of contact.



5. Yes, they are.

6. I have heard of such difficulties; but if, instead of arguing whether or not a ledge belongs to a certain outcrop, the court would order a disinterested mining man to raise up a small hole or shaft, or winze, properly speaking, on the lode until it cuts the surface or comes out in the apex, such matters would be easier settled, and such should be done at the expense of both parties, and would cost less than expensive suits and expert testimony, &c., maps, models. Then the judge and jury could see for themselves. Seldom such troubles arise after great depth has been attained. Say two croppings exist on a hill; my tunnel opens a ledge. I located apex 1. Tom located apex 2. I should simply raise up to apex 1 to prove my ledge to the satisfaction of any one, and prove his assumed dotted course (*a*) wrong and (*b*) probable.



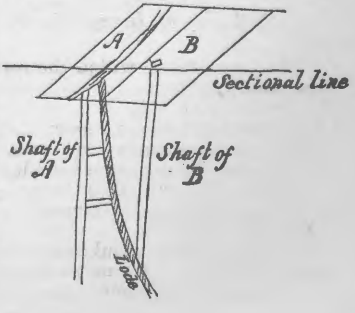
7 and 8. I know of a ledge at Rye Patch Mining Camp, in Nevada, where one lode has two outcrops or apeces. *a* the Depha ledge, the older location; *r* the Rye Patch ledge, the newer location. *r* cuts off *a without a doubt* (I examined the case only beginning of last September), and the suit has just temporarily been settled in the Winnemucca courts. The point contested was not what you ask in 8, but was a question of *a* forfeiting mine on account of legal work not performed.

9. In some instances.

10. Decidedly yes; and Nevada and California mines will certainly suffer by the vertical boundary theory. As far as I am able to judge it is a special Colorado notion to cover its specific cases, which they can do by local laws; but the average of mines in this country would suffer under such legislation.

11. Works both ways; its final result is to open up mineral lands and resources.

12. *B* can try it, but having no case it depends on the judge to allow such blackmail. Should, with a flat dip of the lode the opposite of the sketch, *B*'s shaft strike lode outside of *A*'s side lines at a point not yet reached by *A*, *A* could, with intelligent judge, take injunction on *B* to await proof; but certainly the opposite no intelligent and impartial judge could encourage. *B* certainly can start a suit, as anybody can sue for what does not belong to him, and if he has a sufficient number of men to swear by twenty-dollar pieces he may even cause inconvenience to *A*; but very few laws, if any imaginable, could prevent such an attempt. I don't know of a case where, save a little sparring, it did, under your stated circumstance, cause considerable inconvenience.



13. First part, yes; but would be remedied by my answer to second part, no; but questions of absolute title.

14. Yes, it is.

15. No; but my answer to 2 tells you something of the books of record.

16. They generally modify immaterially the forms required under May 10, 1872, except the affidavit of 2, to testify to the fulfillment of Congressional and local laws, which is hardly ever done.

17. If claim has been located wrong, say, on course, and it is not open to relocation according to law, the original locator simply locates his own claim anew and files and records new notices, recalling the former.

18. Yes. My remedy suggested is that, say, recorder must give, say, two bondsmen of $1,000 each, which bonds are filed with the county recorder of deeds, imposing fines on suggestions made under 2, and enforcing them strictly. This will give us better recorders. The recorder ought to be able to read and write himself, and not use his deputy for it; be able to make rough mine surveys and sketches or plats with a compass.

19. I think it would be well to leave the mining recorder, but force him under penalty to send every ten days copies of notices of location, with survey minutes and plats, to the United States land officers of the district, so as to guard against future frauds and side entries or destruction of records by fire, so prevalent and disastrous in the West, where the high winds prevail.

20. No; I think better leave it to the courts; for in mining districts, at least at present, the judges and bar generally are better acquainted with the practical explanation of mining laws than the far-off land officers; but I think instead of laying mining cases before juries of men prejudiced by ignorance or bribed by parties, as such incapable to judge because it often goes beyond their intellect, that it is better to have three judges to lay the case before. The study and education of a judge qualifies him more than any jury, except it be composed of impartial mining experts, to decide mining difficulties; and in the end it will prove advantageous to all concerned in our mining domain.

21. Outside of remedies suggested I have only to say that, after thus having secured official absolute title by presence, &c., of recorder, and forcing recorder to his duties, that the receipts for the $100 required to be done by law annually should be recorded and filed, with the proper receipts and vouchers, in the mining recorder's office, who in turn forwards them to the land office; that the not filing of such work done, with the vouchers, sworn to before a notary, forfeits the claim if such is not done within one year from the date of location, or the after years, commencing and ending on the date on which claim was located.

22. Yes; I think it will. Two years after day of location I think is sufficient time to prove a claim; and if parties do not do more than $200 worth of work on it, as it is only too often done, such claim ought to be forfeited to the public domain. Provided patent has not been applied for within two years after location, even should several thousand dollars have been expended, I think it should be forfeited; for, as one, the government should profit by our individual possession of the claims, outside of taxes, &c.; secondly, two years is sufficient, if diligently employed, to prove a mine; and when proved the United States should have the benefit of it.

Should I not have been explicit enough in my answers, I shall always deem it a pleasure and honor to add to above.

I remain, sir, your obedient servant,

CHAS. M. ROLKER.

P. S.—I am neither interested in mines nor locations, personally or indirectly.

Testimony of Henry Warren, farmer, McMinnville, Yam Hill County, Oregon.

The questions to which the following answers are given will be found on sheet facing page 1.

1. Henry Warren, farmer; McMinnville, Oreg.

2. In Oregon thirty-two years.

3. Under the donation land laws.

4. Receiver land office Oregon City, Oreg., for nine years.

5. Contested cases six months; uncontested cases the usual time, under each of the different laws.

6. Yes; parties should not be put to the unnecessary expense of advertising thirty days before they can make their entry; neither ought they to be forced to go to the land offices with their witnesses. The new law requiring this is an imposition upon

a class of people who are not able to pay it. It costs now about $30, when under the old law it only cost one-fourth of that sum.
7. Public lands now here is mostly timber and pastoral lands.
8. By a general rule.
10. The present laws are sufficient unless small fractions disconnected from other lands, which should be disposed of at private entry.

AGRICULTURE.

1. Need no irrigation in Oregon; snowfall in valleys; but little in Middle Oregon.
2. From November to February.
3. All portions that can be plowed.
5. All crops.
8. I have no knowledge of it.
12. Many thousand acres.
13. Yes; 160 acres.
14. One hundred and sixty acres.
15. Four acres.
16. Fifty head.
18. Diminished.
19. Yes.
21. Plenty.
22. Ten.
23. Diminished.
24. No; sheep will starve the cattle.
25. None as yet.
26. Don't remember.

TIMBER.

1. Large amount in the mountains.
2. Fir, spruce, hemlock, oak, ash, alder, &c.
4. I would classify the land as to price.
5. No, not in the fir-bearing land.
6. Generally from carelessness; heavy penalty should be paid for it.
7. Not much in this section of the country; timber not easily gotten at.
9. No.

Testimony of Orson A. Stearns, Plevna Precinct, Lake County, Oregon.

The questions to which the following answers are given will be found on sheet facing page 1.

LINKVILLE, OREG., *November* 28, 1879.

To the Public Land Commission, Washington, D. C.:

In answer to the interrogatories propounded in your circular addressed to myself, I beg to submit the following:

1. My name is Orson A. Stearns; I reside in Plevna Precinct, Lake County, Oregon; am a farmer by occupation.
2. Have resided in this county since the earliest settlement; was the second person to take up a place in this county, and while yet it was a portion of Jackson County. Have resided in this State since 1853.
3. I have sought to acquire title to a piece of government land adjoining some I purchased of the State of Oregon under the soldiers' homestead law.
4. I have been connected as witness and principal in an innumerable number of contests between settlers and swamp-land speculators.
5. The time of securing title to public lands varies, and in uncontested cases is unimpeded and easy to obtain. In contested cases, where the conflict arises between the settler and swamp or other land monopolies, it is frequently prolonged until the settler is frozen or starvedout. Within my own knowledge, several contested cases which were tried over three years ago are undecided as yet, and several others have been tried over and over again under some ruling of the Commissioner of the General Land Office.
6. There have been serious defects in the operations of the land laws, resulting sometimes from he different constructions placed upon them by different officers, sometimes by the ocal land officers being interested in land speculations, or being appointed to their positions through the influence of wealthy land speculators to enable them more easily to defeat the claims of settlers. The present manner of taking depositions

n land cases, when the interrogatories, cross and rebutting, have to be filed, is not icalculated to develop the facts in the case, but rather promotes falsifying and perjury. I believe all evidence allowed in contested cases should be produced at the time of trial, and all witnesses should testify in the presence of the local officers and the adverse party, subject to the rules of evidence, and all *ex-parte* testimony be inadmissible. It would prevent false testimony being used as extensively, as a majority of the hired witnesses would not testify where they were cross-examined and confronted with the adverse party.

7. The lands in this county are largely pastoral, though along the water-courses and next the foot-hills some considerable tracts of good farming lands are found. The high altitude of this country and its liability to frost at any time during the summer renders farming, except hay raising, rather precarious, save in a few favored localities. The timber is confined to the spurs of the Cascade and Sierra Nevada Mountains principally, though the high hills which separate the innumerable valleys and basins of this county are partially covered with juniper, and in places with pine and fir timber. The water-courses here are generally destitute of timber. Immediately along the larger water-courses and upon the borders of the many lakes and marshes are valuable hay lands, without which the pastoral pursuits would be very precarious. A great portion of the level lands not marshy are covered with a growth of sage brush and other brush peculiar to the light, friable soil found here, with intervening patches of low alkali patches or basins, where there is little vegetation found except a short salt grass.

8 and 9. In my judgment the deputy United States land surveyors should give the nature of the soil and its adaptability to the different pursuits, especially in a country like this, where such a wide difference exists in lands so contiguous to each other. In a pastoral country, where farming is neither profitable nor successful, native meadow lands should be classed as such, and not returned as swamp or overflowed where they can be profitably used in the pursuits of husbandry in their native or wild condition. Pastoral lands, or such as are unfit for agriculture, embracing a large area of this county, are of two classes—the hilly bunch-grass region and the sage or so-called desert tracts—where there grows a variety of grasses among the brush that afford sustenance to vast numbers of horses, cattle, and sheep. The timber lands should also be classified and priced according to their relative values. First, heavy timber or forests, where the timber is almost the only product of the soil and is suitable for lumbering purposes; second, the more thinly-timbered kinds, where the timber is less valuable for lumbering purposes; and third, that class that is sparsely timbered, or only sufficiently so as to afford fire-wood and for some of the necessary improvements usual to newly-settled countries.

10. In my opinion, every settler upon the public domain should be allowed to purchase, at as low a valuation as it may be placed at, from 40 to 120 acres of timber land as near as may be to his farm, when such farm is prairie land, or so nearly so that there is insufficient for fire-wood or the improving of the land.

AGRICULTURE.

1. In this county the rainfall is light, the summers being nearly always dry. The snow falling frequently before sufficient rain has fallen to start the grass, generally melting off in February or March on the open country, but remaining in the mountains until May or June. Summer rains are generally followed by frosts, except in sheltered or highly-favored localities. The water supply, except in places, is limited, and from the nature of the valleys, being low and level excepting in the foot-hills, there is not much chance for irrigation during the time such a measure would be beneficial, owing to the fact that in most places the streams or channels from the mountains become dry early in the season.

2. The rainfall generally occurs either in November or in February and April. I do not know its relative quantity, as it varies with the seasons, sometimes being greater in the fall, sometimes in the early spring.

3. By fall plowing, where practicable, or summer fallowing, the larger portion of the arable land can be successfully cultivated without irrigation.

4. Where practicable to irrigate, it would be beneficial to the larger portion of the lands, especially where too sandy or too strongly alkaline, as the water would tend to wash away and destroy the alkaline deposits that accumulate on the top of the land, as it dries and burns up or destroys the tender vegetation.

5. Very few crops are raised by irrigation; except in a few localities it is not practiced, and then only in gardening.

6 and 7. The water supplies here are generally the lakes, or deep, sluggish streams, that are raised sufficiently by the melting snows to dampen the low lands around them, excepting in dry seasons. Very few of the feeders to these lakes and rivers but are too remote from the agricultural portions to render them available, as the country is

so broken up into separate valleys and basins that canals to carry these waters would be too costly and expensive to be constructed.

8. In this part of the country there have been no opportunities for practical observation of the effects of irrigation. Crops are raised here at various altitudes, from 4,200 to 4,500 feet.

9. Is not pertinent to this country, for reasons above stated.

10 and 11. Comparatively none.

12. At least nine-tenths of it; or more, including timber range.

13. It is; and the quantity should be not to exceed one section of strictly pasture land.

14. It is not, excepting where the country has been settled for a number of years and the agricultural lands nearly or quite all exhausted, when I would allow each settler to enter contiguous pasture lands, which, together with his other lands, should not exceed one section.

15. From 10 to 12 acres. In newer sections, where the range has not been overstocked, it takes less.

16. From 100 to 125 head.

17. Cattle and horses both; there are perhaps about 30 to the square mile.

18. It has diminished, except in places remote from water, where it is only grazed during the late fall months.

19. Where they can secure a large range by a little fencing they do, but they generally run on the common, and are only separated during the winter, when they drive up those they wish to feed. They could be when water is plentiful for their use and feed provided against severe storms; otherwise, not.

20. Undoubtedly they would, as with the present system the enterprising man is taxed to improve his less enterprising neighbor's cattle, and bulls are not confined, but roam at will through the country.

21. Springs, rivers, and lakes or ponds.

22. Six sheep are generally equivalent to one cow.

23. I think it is injured less by sheep than cattle, unless they are kept too continuously upon one place year after year.

24. They will not to any extent.

25. Cattle men have strong prejudices against sheep, as the latter will drive the former away from any range where they are kept.

26. There are more cattle than sheep; the former are not herded; the latter are kept in herds of from 700 to 3,000 each.

27. I believe none, as my opinions are set forth very fully in preceding answers.

28. There is, on account of the insufficiency of the mounds and the poor quality as well as insufficient size of the posts set to mark the corners.

TIMBER.

1. The exact or approximate amount of timber in this county I could not state. On the west side of the county, which embraces the eastern slope of the Cascade Mountains, there is a heavily timbered section, consisting of yellow and sugar pine, yellow cedar, red and white or balsam fir, with a few smaller and worthless varieties. The crests of the higher mountains dividing the numerous valleys and basins of the county are covered with a similar growth of pine and fir, while on the lower hills, and scattered in small clumps or clusters, there is a considerable amount of juniper timber. There is, perhaps, one-third of the area of the county covered with a growth of timber.

2. There is no timber culture in the county within my knowledge, only a very few small orchards of fruit-trees set out.

3. I would dispose of the public timber by sale only, and classify the timber lands as first, second, and third quality—the heavily timbered constituting the first or most valuable class, which I would sell in 40-acre lots only, and at a minimum price of $4 per acre. The second class, where the growth was less heavy and valuable, I would limit to 80 acres and place the price at $2.50 per acre; while the third class, which would embrace lands that were very sparsely timbered or covered with timber suitable only for fire-wood and the many requirements of a farmer's or rancher's uses, I would limit to 160 acres and fix the price at $1.25 per acre. This would enable those owning lands that were not supplied with timber to purchase and control enough for their own use and insure an economic use of the same.

4. Included in above answer.

5. In the heavy pine and fir forests there is a second growth, but it takes at least two or three generations to enable it to reach sufficient size to be valuable. In the juniper forests there is no new growth.

6. Forest fires here are generally the result of carelessness or wantonness on the part of hunters. Generally they are built by Indians to concentrate game. The method of prevention in the former case would be to make it an offense punishable with a heavy fine or imprisonment, and give half the amount recovered, or a sufficient

remuneration, to insure the conviction of the guilty parties. In the latter case punish the Indians by taking from them their annuities or forbidding them the privilege of hunting outside their several reservations.

8. The local customs as to cutting public timber are that the ownership rests with the party cutting it, except where such party is hired by the day, which is a rare occurrence. Rails, shingles, shakes, cord-wood, fence-posts, and saw logs are generally purchased of the party who fells the timber at customary prices, and are often contracted for in advance. In this section the dead and fallen timber is generally used for fire-wood, except near the towns, where it is customary to fell green timber and cut and cord it and let it season. Fence-posts are generally made of dry timber, either fallen or standing, as it is generally conceded that such timber lasts longer when set in the ground.

9. I think it would, if instructions and regulations were adopted to render their administration efficient and impartial. But such offenses are usually condoned or overlooked in large or wealthy corporations, and only noticed where the offender has been informed on by some jealous or vindictive neighbor.

Very respectfully,

O. A. STEARNS.

Testimony of Charles M. Foster, surveyor and civil engineer, Baker City, Baker County, Oregon.

The questions to which the following answers are given will be found on sheet facing page 1.

Answers to questions submitted by the Public Land Commission.

1. My name is Charles M. Foster; residence, Baker City, in Baker County, Oregon; occupation, a surveyor and civil engineer.

2. Have lived in the county seventeen years.

3. Have not.

4. During the past nine years much of my time has been spent in assisting parties in obtaining title to public lands, under the pre-emption, homestead, mining, desert, and timber laws of the United States.

5. Under the pre-emption law it requires from forty-five months to five years to obtain title, and costs the claimant from $21 to $50 exclusive of acreage. In contested cases the time and expense are increased indefinitely. Under the homestead law it requires from six to eight years and costs from $43 to $90 to obtain title. Under the mining laws it has required not less than two years, and in some instances seven, to procure title. Under the timber and desert acts no titles have been obtained in this county, although the provisions of law have been executed and complied with. The expense of obtaining title to mineral lands in each case range from $125 to $500, exclusive of acreage.

6. The following provisions of the pre-emption and homestead laws, in my opinion, ought to be changed, to-wit: "An act to provide additional regulations for homestead and pre-emption entries of public lands," approved March 3, 1879. The above act requires the claimant of pre-emption and homestead lands to give notice of intention to make final proof by publication in a newspaper for thirty days. It is difficult to conceive the object of the above act. As the homestead and pre-emption laws provide how and in what manner contested cases shall be determined, and further provides that none but actual settlers can receive the benefit of those laws, hence it follows that none but an actual resident upon the land can have and maintain a valid adverse claim; consequently it follows that the notice required above is given for the benefit of no one but the applicant's neighbor, who must be a resident of the same tract of land in order to be interested in the final proof; hence the published notice is a useless expense, as all adverse claimants must be, or must have been, upon the land and, of necessity, be in full possession of all the facts relative to the rights of the original claimant.

Under the present homestead law, an applicant, if not residing upon the land, or some member of his family, must appear at the land office and make his affidavit. If he, or some member of his family, is residing upon the land, he can make his affidavit before the clerk of the county. Query: Why discriminate, and force the applicant to travel 150 miles to visit the land office, which is the case in this district? Again, under the present pre-emption and homestead laws the applicant, in making final proof, must present himself in person at the land office and make his final affidavit, while the affidavits of his witnesses are permitted to be taken before a clerk of a court of record or county judge. Why compel the claimant to travel long distances to reach the land office, and allow his witnesses to be qualified before a county clerk or judge?

7. The physical character of the public lands in this land district are arable, irrigable, timber, pasturage, swamp, and minral, and can only be classified by geographical divisions.

AGRICULTURE.

1. Climate, mild. Rainfall, light. Snowfall varies from none to two feet in the valleys. Water-supply for irrigation is limited.
2. The rainfall occurs late in the fall and early in the spring. From May until October no rain can be expected; consequently, during the irrigating season no rain can be expected.
3. No portion.
4. About one-tenth.
5. All crops are raised by irrigation.
6. About 3,000,000 cubic feet of water. Some land requires more, some less, owing to its character.
7. The sources of water-supply are the mountain streams that are fed by the snowfall; in summer they shrink to one-third or one-teuth of their spring quantity.
8. I have no experience on the subject of irrigation, only in this county. The fertility of the soil is unquestionably injured by irrigation, not only in proportion to the increase of crop produced by it, but also by reason of the washing away of a portion of the soil yearly.
9. It is impossible to calculate the portion of water wasted in irrigation, and the portion returned to the stream. Some soils absorb treble the quantity of water of others. The return of surplus water to the stream, after irrigating, is voluntary. The doctrine prevaling here is that the first appropriator of the waters of a stream has the entire and exclusive control of the water he appropriates, consequently subsequent location of farms upon a stream affording but a limited supply of water are made at great peril. Much trouble and litigation has arisen from the practice of one man controlling the water of a stream. There should be a law enacted requiring each farmer located upon a stream of water to use the water judiciously and return all the surplus water to the natural channel, so it could flow on to the next farm below.
10. The waters of all streams available for irrigation are claimed, under the common rule of miners, by posting a notice at the point on the stream where the water is to be diverted, and by cutting a ditch to convey the water.
11. Conflicts relating to water rights arise from two parties claiming water from the same stream. The quantity appropriated and the priority of appropriation are the principal questions to be decided.
12. About nine-tenths.
13. It is not practicable.
14. Thousands of acres of the pasturage lands in this land district are already in market, and have been for years, but no one will buy.
15. Cannot say what quantity of land is requisite to pasture one head of beef, as the pasturage lands dry out and the grass becomes too dry for the cattle to eat in the dry season, and they resort to the bottoms and low lands.
16. One hundred and fifty head of stock cattle.
17. About five head, taking the whole county.
18. It has diminished. Bunch-grass will not bear feeding.
19. They do not. Cattle cannot be confined in winter unless fed.
20. No.
21. Mountain streams.
22. Seven sheep are equal to one cow.
23. Has diminished.
24. They will not.
26. In this county there are 50,000 cattle and 30,000 sheep, in herds of 5 to 5,000.
28. There is not, as the surveys are of recent date comparatively.

TIMBER.

1. There are about 100 square miles of timber lands in Baker County. Its character is pine, fir, and tamarack.
2. No timber planted.
3. My opinion is that timber lands should be disposed of the same as placer mining ground is at present—that is, by legal subdivisions where the surveys have been extended, and unsurveyed lands to be surveyed in tracts not exceeding 160 acres, in any form the applicant might desire. The reason for such disposition is this: In all of the mining districts in this State the timber lands are located upon the mountains, and are never sectionized by the government, for the reason that sufficient land cannot be sold to justify the expense. Hence the necessity of some law whereby persons who desire to manufacture lumber in these mining camps and districts can purchase timber wherever they may wish. The present timber act applicable to Oregon is simply an outrage upon the people in every section of the State where the timber lands are not sectionized. In this part of Oregon it virtually compels every man to cut his own wood and manufacture his own lumber. It is difficult to conceive of a

greater absurdity than the present law. I think 160 acres are sufficient for one person, and $2 per acre a sufficient price. Trees in our forests suitable for making lumber are scarce, hence the necessity of allowing a party to buy as much as 160 acres. A stumpage law would work well here.

4. I would not classify timber lands.

5. There is a second growth of timber; same character as the original. Its growth is slow.

6. Indians are the prime cause of our forest fires. Each year the fires consume more wood than the entire population of the country. The prevention of these fires is simple—kill every Indian that leaves his reservation.

7. No unnecessary depredations are committed.

8. Have no local customs.

9. If the present timber laws were enforced it would necessitate the abandonment of this entire county. The timber laws would undoubtedly be more efficiently executed if placed within the jurisdiction of the district land officers.

LODE CLAIMS.

1. Have mined more or less in California, Oregon, and Idaho Territory during the past twenty years. Have acted in the capacity of deputy United States mineral surveyor since 1871.

2. There are many defects in the mining acts. First, there is altogether too much red tape, too much expense, and too much time required to obtain title. (See my answer to question 21.)

3. The official practice of filing surveys of lode claims which overlap on the surface is wrong, and wholly unwarranted by the mining law. Section 2322 of Revised Statute gives the locator on a lode all the surface ground and all the mineral-bearing veins within his lines of location. Hence what right has a subsequent locator to overlap another claim?

4. The top or apex of a vein or lode is that portion of the vein that is visible in the country rock when the loose dirt or earth has been removed. Some veins stand up above the country rock like a wall. The top of such veins would be the highest part of such wall above the ground or bed-rock. The top of a vein can be determined by uncovering it at any point; the true strike of a vein can only be determined by uncovering the entire vein or by uncovering it at various points so as to prove its continuity; the dip must be determined by sinking a shaft or incline on the lode. It very seldom happens that all these features can be determined in the early working of a vein.

5. The rights of a discoverer are properly protected under the present law, the burden under which he labors being the determination of the true strike of the vein. This he must ascertain or take the chances of not including the vein within his lateral boundaries. The dip of a vein cuts no figure in the original location of a claim.

6. Litigation has not, to my knowledge, grown out of the impossibility of determining the true course of a vein, but has ensued from carelessness in making a location before the strike of a vein was determined. The famous Emma mine in Utah was located crosswise of the vein instead of lengthwise through a misapprehension of its true course.

7. Have not.

9. I have never known the outcrop of a vein to exceed the legal width of a claim. The float may be distributed over a space wider than a lawful claim.

10. They do, unless the true course of the vein is determined before the claim is located; hence the fault of the present law requiring the end lines to be parallel.

11. Locations on alleged veins are not permissible under the present law. No location can be made until a mineral-bearing vein has been discovered.

12. B cannot under the present law. The original locator can follow the dip of his vein wherever it goes.

13. I have known litigation to arise from a subsequent locator striking the original vein outside of the lateral lines of the original claim, but the only trouble in such cases can be removed by connecting and tracing the vein in the first location to the works on the subsequent claim. Whenever it is shown that the subsequent locator is working the same vein as the original locator, then there can be no chance for dispute under the present law.

14. It is difficult to conceive what provision could be inserted in the mining law affording any further protection to miners in following the dip in their veins or that would prevent litigation.

15. At Auburn, in Baker County, Oregon, I was present and assisted in organizing a local mining district. There were about thirty miners present; none others took part. The only officer elected was a district recorder. His duties consisted of going upon the claim (when called upon to record it) to measure it and to describe it with sufficient certainty so it could be readily found, and to record and number the claim in a

book kept for that purpose. The record-book of a mining district consists of a book in which the boundaries of the district are described and the rules governing the location, holding, and making of claims, and if the book is of sufficient size, it also contains the record of location of claims. The books commonly used are 4 by 7 pass-books, carried in the pocket. When one is full another is procured, and in course of time some of the books are lost or mislaid; hence the records are in nine cases out of ten defective. At the present time in this section of the State not one mining district in five pretends to keep up an organization.

16. The common mode of taking up and locating a mining claim under local rules is to measure off the claim of the size allowed and set stakes at the corners, and then post a notice on the claim and have the notice recorded by the local recorder of the district. The object of the record is to give notice to outside parties that the particular piece of land has been claimed. So long as the claimant complies with the local rules he can hold the claim.

17. The record cannot be altered, but a new location can be made covering the original claim and embracing others.

18. Litigation has ensued from fraudulent manipulation of records, and there is no security against it.

19. Local mining laws and rules are a nuisance, and should be abolished at once and the initiation of record title be placed with the county clerks of the various mining counties. The land office is too remote from the mines in these Western States. For instance, a party wishes to ascertain whether a particular tract of ground has been located. If the record of such location is in the district land office he must travel hundreds of miles to ascertain. The county clerk's office is the proper place.

20. To transfer the jurisdiction of controversies concerning mineral lands from the State courts to the local land officers would, in my opinion, be wrong for two reasons: 1st, as a rule United States land officers are poor lawyers, even in land matters, and I think that our circuit and district judges can come nearer doing justice to mineral litigants than the local land officers; 2d, it would be very expensive for litigants to attend the United States land office with their witnesses, the distance being so great.

21. I think it desirable to retain the leading features of the present mining laws; its red tape and expensive administration are its most obnoxious features. To illustrate I append a list of papers that are essential in order to place a claim before the General Land Office for patent.

1st. Request of claimant for survey—the request must be in writing, and made to the surveyor-general.

2d. Estimate of office work in surveyor-general's office.

3d. Claimant makes a deposit of such expense.

4th. Three duplicate receipts of such deposit, one of which is sent to United States Treasurer, one to surveyor-general, and the third is retained by the claimant.

5th. Order of surveyor-general to deputy surveyor to survey claim.

6th. Survey of claim and field-notes of same.

7th. Two affidavits of assistants in making survey.

8th. Affidavit of deputy surveyor as to the correctness of survey.

9th. Certificate of deputy surveyor to character of ground and value of improvements.

10th. Affidavit of two disinterested persons as to value of improvements.

11th. Plat of claim and field-notes for surveyor-general.

12th. Affidavit of two persons that no vein or lode exists on the claim. (If the claim is a placer.)

13th. Four plats of claim made by surveyor-general.

14th. Two copies of field-notes, with two certificates on each.

15th. Notice of application for patent posted on claim with field-notes and also plat of claim must be posted on claim.

16th. Affidavit of two disinterested persons that the notice of intention to apply for patent, copy of field-notes, and plat of claim were posted.

17th. Affidavit of claimant of citizenship.

18th. Certificate of no suit pending (by clerk of county).

19th. Sworn application of claimant for patent.

20th. Certified copy of original notice of location and abstract of title.

21st. Agreement of publisher not to hold United States responsible.

22d. Transmission of papers to land office with $10 register and receiver's fees, with request for order of publication.

23d. Order of publication.

24th. Affidavit of claimant that notice and plat remained posted on claim during sixty days of publication.

25th. Affidavit of claimant to costs in case.

26th. Affidavit of printer that notice was published.

27th. Certificate of register that plat, field-notes, and notice were posted in his office sixty days.

To the above maze of red tape add the exorbitant fees of the surveyor-general, which on this coast range from $25 to $40 in each case; the local land office fee of $10, and the printer's charge of $15 and $30 in each case, and is it to be wondered at that so few miners seek to obtain title under the present law. But the above expense is not all; in order for the miner to engineer his claim through to patent he must call to his aid the services of an attorney, which never are less than $50 and sometimes reach $500.

We will now eliminate some of the red tape and state what we believe to be necessary steps for a miner to take in order to obtain a patent.

1st. Let the claimant make his application for survey of his claim direct to the deputy surveyor, this will save one month's time in this State.

2d. Let the deputy surveyor make the survey and return a transcript of the field-notes to the surveyor-general. Abolish all fees to the surveyor-general.

3d. After the survey is made let the claimant post upon the claim for sixty days his notice of application for patent, giving a description of the claim by the field-notes. No plat is necessary to be posted.

4th. At the expiration of the sixty days let the claimant make his application for patent to the land office, showing his title, amount of improvements, citizenship, &c., as at present, and pay his acreage. Abolish the publication of notice, it does no good, not one miner in fifty ever sees a copy of the paper containing the notice; with equal propriety you might require the pre-emptor of agricultural lands to publish a notice.

22. There ought to be a limitation to the possessory title to a mining claim, and the claimant should be compelled to acquire title from government within two years from date of his location, and where claims have been held and marked for a series of years the owners should be compelled to obtain title or commence proceedings therefor within one year.

PLACER CLAIMS.

1. About one-tenth, and mostly surface diggings.
2. I am. Have spent several years in mining, and have acted in the capacity of United States deputy mineral surveyor.
3. Not less than two years and often five and seven years to obtain United States patent without contest and twenty-four hours to obtain possessory title to a mine without contest, and a lifetime with contest.
4. The experience of others in this vicinity corroborate the above answers.
5. They are defective.
6. There is no time fixed in the present mining law in which the applicant for patent must pay for the land embraced in his claim; consequently parties to my personal knowledge have made application for patent and then rested their case, and worked the claim out and gone elsewhere; hence in many instances the government never realizes a dollar for the ground. (See my answer to question 21 under caption of lode claims.)
7. No titles are obtained for non-mineral lands.
8. It has not.
9. I do not.

Testimony of J. L. Morrow, merchant, town of Heppner, Umatilla County, Oregon.

The questions to which the following answers are given will be found on sheet facing page 1.

1. J. L. Morrow; town of Heppner; merchant.
2. Fifteen years.
3. Not any.
4. My experience has been limited.
5. Can't call to memory any.
7. We have complete variety. Mountains covered with timber, plains undulating and covered with grass and every variety of soil; both pastoral, agricultural, mineral and timber.
8. My opinion is the pastoral lands of this county ought to be surveyed and sold in lots of 1,000 acres, timber lands sold in lots from 40 to 160 acres.
10. My opinion for this part of the country the land system of disposing of lands is as good as can be. However, I would subject to survey all this country and sell in lots of 1,000 acres and limit each man to that amount.

AGRICULTURE.

1. Can only say we have good climate, very seasonable, plenty of water for irrigation.
2. October 1; sufficient amount, and ceases about July 1.

3. My impression is the great mass of the country can be cultivated without irrigation.
5. Vegetables of every variety; fruits, grain, &c.
6. Can't say; just owing to location and soil.
7. Small creeks running all through the country.
8. Don't think irrigation injures the soil.
10. The country is full of small creeks and as it passes through the country it is used as they want it.
12. One-fourth.
13. Yes, and allow 1,000 acres to each settler.
14. Yes. Yes; to 1,000 acres.
15. Ten acres to every head.
17. Don't know.
18. Grass is diminished.
19. Not any. They could be confined in safety in limited quantities.
20. Yes.
21. Plenty of water.
22. About five to every beef.
23. Diminished.
24. No.
25. Not any.
26. One half-million; herded in lots from 1,000 to 3,000.
28. Yes.

TIMBER.

1. Fully one half of this county is timber lands—pine, fir, tamerack, principally.
2. Not any, except for ornamental purposes.
3. By sale. A portion of our country is mixed—both timber, agricultural, and pastoral. In land of this kind I would sell in lots of 1,000 acres; in dense timber, in lots from 160 to 200 acres.
4. Yes; throw it open to settlers at reduced rates.
6. Move the Indians, and forest fires cease.
7. No unnecessary waste in this part.
8. Just enough for immediate use by settlers, in fencing, &c.
9. Yes.

LODE CLAIMS.

1. None.

We have both placer and quartz mines, but my experience is very limited.

Very respectfully,

J. L. MORROW.

Testimony of Robert Mingus, Tuscosa, Oldham County, Texas.

The questions to which the following answers are given will be found on sheet facing page 1.

TUSCOSA, OLDHAM COUNTY, TEXAS, *December* 2, 1879.

Public Land Commission:

SIRS: In answer to the questions contained in your circular, I beg to submit the following:

1. Robert Mingus; Palo Duro Cañon, Staked Plains, Panhandle, Texas.
2. I have wintered sheep in the Panhandle of Texas during the past three years, but my residence has been for six years chiefly in Colfax County, New Mexico, and to which section my replies will be mostly directed.
3. I have never even sought to acquire title to any public land.
4, 5, 6. There seems to be no difficulty in getting as many claims as may be desired. Frequently several miles along a stream are occupied and controlled by one man, the titles to these lands being had, in many cases, by hired perjurors. I might add that it would be impossible to prosecute the stock business, in many sections, if the provisions of the land laws were strictly executed.
7. In addition to the mountainous portion of Colfax County, there is considerable mesa country very suitable for summer grazing; the balance of the county is prairie; it consists of pastoral, mining, timber, and agricultural lands. The same statement will apply to the counties of Mora, San Miguel, and, I believe, to the greater part of New Mexico and Colorado.
8. A thorough survey under competent charge is the only method by which the land can be properly classified.
9. No answer.
10. The existing system is probably as good as could be devised for agricultural

lands; but as nine-tenths of the country is only adapted to pastoral purposes, the present plan does not meet the wants. I would lease and sell land, in addition to existing privileges, in large or small quantities, to actual settlers.

AGRICULTURE.

1. Climate moderate; rainfall limited; length of seasons varies very much with altitude; snowfall considerable in the mountains and but little on the prairie; water for irrigation extremely limited.

2. Some little rain or snow is expected in March and April, which starts the grass; very little rain in May or June; in July and August it rains every day around in spots; in September and October, dry; not more than one or two storms in November, seldom lasting over twelve hours; December, January, and February are probably more stormy than November. If the whole rainfall of the past twelve months had been concentrated at the time most needed for agricultural purposes, it would have been decidedly insufficient, and this would be the case eight out of ten seasons.

3. None.

4. Little.

5. Wheat, barley, corn, oats, vegetables, &c.

6. No answer.

7. Some land can be farmed on most of the running streams. On the Canadian, Pecos, Rio Grande, Mora, and Vermejo Rivers there is considerable farming done at the present time. The Rio Grande and Pecos Rivers run through very rich valleys, which are capable of producing most anything that grows. Since the advent of railroads, however, even these rich valleys will not be able to compete with Kansas in the production of grain; but they can spread themselves in most any other direction with profit.

8. Crops of wheat, oats, barley, some corn, potatoes, &c., are grown on the head of Dry Cimarron River, Colfax County, New Mexico, about 7,000 feet altitude.

9. No answer.

10. Very little, if any, water remains to be taken up in Colfax County, and I believe this statement would apply to the neighboring counties, to a considerable portion of New Mexico, and to a still greater extent of Colorado. On surveyed lands, under the homestead and pre-emption acts as well as by custom, which permits a settler to own and control by the erection of cabins from one to ten claims. On unsurveyed lands a cabin, and in many cases four logs, a "foundation" as it is called, control water rights.

11. I believe there is some trouble at times over water rights for irrigation purposes. In some sections there may be a dispute between stockmen over water privileges—especially is this liable to occur between the cattle and sheep interests.

12. In Colfax County, outside of what might be termed mineral land, about 999 acres out of every 1,000 is adapted to pasturage only, and this statement will apply to all of New Mexico, California, and Arizona.

13. Yes; at least 10,000 acres.

14. Yes; the quantity sold to each person ought to be limited.

15. Thirty acres; this I should say was the general average of California, New Mexico, and Texas.

16. Two hundred head of good cattle.

17. In thickly settled portions of Colfax County, from 15 to 20 head of cattle per square mile. In other sections not one-tenth that number.

18. I notice in six years very little change, where the range has not been overstocked.

19. Very little fencing done in New Mexico for any purpose whatever. Stock could be fenced in if there was suitable shelter inside the inclosure. During a storm they require natural or artificial shelter. Texas stock would carry away any barrier in the fence line in a case of emergency.

20. Directly.

21. In Colfax County, the Canadian, Dry Cimarron, Red, Vermejo, and Cimarron Rivers, the Uña de Gata, Chiconia, Crow, Rayado, Chico, Palo Blanco, Don Carlos, and Ute Creeks, the Tenaga, Carrizo, Ponca, Tramperos, Cenigilla la Barro, Rafael, and Currumpaon arroyos, and various other small streams, arroyos, springs, and lakes.

22. Seven head.

23. I can see no change where the range has not been overstocked.

24. An experience of five years in Colfax County, in the heart of the cattle range, requires a positive "Yes."

25. There is a prejudice among all cattle men respecting the sheep interest. Many of these cattle men claim, and no doubt they are honest in their opinion, that sheep will drive cattle entirely off their accustomed range; that the hoof of the sheep poisons the earth—directly the reverse of the old Spanish proverb. There have been frequent serious disturbances in Colorado in times past, especially in Huerfano County. In Col-

fax County, New Mexico, there have been Mexican sheep-herders murdered within two years, and I recollect of two cattle men being shot by a Mexican sheep-herder several years ago in my neighborhood. There has been no disturbance in Colfax County between the cattle and sheep interests which properly belong there; some ill-feeling probably on the part of some particular individuals, but it has never gone any further, the sheep men, as a rule (outside of the traveling Mexican herds), confining their stock to a specified range, while the cattle interest claim no particular range, except as to sheep, but the whole country in general, and which necessarily includes all the sheep ranges.

26. Don't know the number of cattle and sheep in Colfax County. Cattle are not herded. Sheep are herded in flocks from 1,000 to 3,000 head.

27. The present system of disposing of government land in this country has always seemed to me entirely unsuited to its one valuable quality. Outside of the mineral land, the only land worth taking into consideration is the pastoral land. Very little improvement can be made in the present unsystematic way of conducting the stock business until stockmen own their ranges. In disposing of lands for pastoral purposes, care must be taken to protect the settlers who have already acquired lands under the present laws. I would therefore allow and reserve for each quarter-section claim (160 acres), and adjoining thereto, forty full sections (25,640 acres) for pastoral purposes. These settlers should be required to buy or lease all or any part of these reserved lands within three years, or else forfeit their right to the especial reservation. Whatever land is not reserved for these settlers should be sold or leased in any sized tract, not to exceed, however, 160 full sections (102,560 acres), and only to actual settlers. The water privileges might be in addition to this amount—say to the extent of one full section (640 acres). The price of land on the water should be $1.25 per acre, which would protect the farming interest, while the grazing land should be at 20 cents per acre. The rent about 6 cents and 1 cent per acre. The timber ought not to be disposed of; it should be reserved for the use of the settlers, under proper restrictions; the grazing privileges, however, could be sold; the owner of this privilege would naturally act as a guardian over the timber. Purchasers and lessees of land should be required to stock it to one-fourth its capacity within a stated time. These are the main features of a plan for disposing of the government land in this western country, and I believe if a system embracing these ideas could be adopted much good would result therefrom. A great deal of land very distant from water, unproductive now, would soon be adapted to stock by the sinking of wells and the making of reservoirs. The government would derive a handsome revenue directly and indirectly; it would place the stock business on a permanent basis; the production would not only be increased, but the quality would be vastly improved; it would settle up the country quickly and permanently; it would end the hostilities between the cattle and sheep interests, and, finally, it would necessarily be a big agent in settling the Indian question.

28. I believe there is no trouble in ascertaining the corners of surveyed lands in Colfax County.

Timber and mining questions unable to answer.

Respectfully submitted,

ROB'T MINGUS.

Testimony of T. C. Bailey, Salt Lake City, Utah.

SALT LAKE CITY, UTAH, *December* 8, 1879.

SIR: Having been requested by General Frederick Salomon, surveyor-general, and Colonel John B. Neil, register of the local land office in this city, to submit my views upon the several subjects of which the honorable Commission takes cognizance, I have the honor to submit the following:

I have been connected with the public land surveying service for about eleven years, in various capacities, as chief clerk in the surveyor-general's office in Montana and Utah, United States deputy surveyor and land agent, and therefore should know, from such a long experience something about the land laws of our country.

THE CLASSIFICATION AND SURVEY OF THE PUBLIC LANDS.

I deem the present classification under the following heads to be sufficient, viz: Agricultural, coal, mineral, timber, irrigable, and desert; grass lands are included under the first head, as also should pastoral lands.

The present rectangular system of public surveys cannot be improved upon as I can see, except in one instance, and that is to allow surveys of five and ten acre lots to be made in narrow cañons where the townships and section lines cannot be run, and allow

settlers to enter said lots by five or ten acres under the present laws; these lots to be numbered on the plats by lot numbers in red ink in each section, keeping up the township and range as now. By this means the good land can be surveyed and the settler can enter the land he wants without being compelled, as now, to enter not less than forty acres and thereby get more rocks and mountain than good land. I do not advise any departure whatever from the plan now used in designating the public surveys by section, township, and range. This plan is definite and sensible. No better plan has ever been devised. If a system of triangular surveys are instituted at this late day confusion in their designation and *locus* will surely arise. Note the confusion now existing in the triangular and even rectangular surveys of mining claims. Only allow the surveyor to make subdivisions into the five or ten acre lots above spoken of wherever necessary to take in good land and exclude the worthless, and you will have it; nothing further is required.

The present plan of surveying the public lands by contract has been carried on for a great number of years, and it is no small matter to devise or suggest a better plan to meet all the requirements of the government and the settler. The present plan, I must admit, has at times been abused by deputy surveyors, but I venture to assert that this service has been less abused and carried out with as much integrity as any other branch of the public service. No matter what errors are made the designation under the present system of any piece of land, no matter how small, can be made certain.

Under the contract system the deputy is paid so much per mile to make his surveys and return his notes and plats. Out of this rate per mile he is to pay all of his expenses, such as for instruments, his horses, wagons, camp equipage, assistants' "grub," breakage and damage of his solar compasses, &c., &c.—all to be paid for out of his own pocket, much of it months, and even years, in advance of his receiving a single dollar from the government; so that when his accounts are finally settled and paid the poor hard-worked deputy foots up and finds that he has barely made both ends meet. Now, as time is money with him, he must hurry with his work and make as many miles a day as possible. He cannot afford to stop and wait to see that his axman sets the corners correctly, as instructed; nor can he afford to watch his chainmen in sticking every pin and measuring every chain and taking the distance to notable objects. These men are sworn to do their work correctly, and so the deputy must of necessity rely on them; otherwise, were he to take the time to watch them continually, he would make but slow progress and come out at the "little end of the horn" financially; therefore he must hurry up and "make time." Herein mistakes and errors are caused, which are corrected at once "within limits," and the surveyor hurries off on his lines again.

Now, the only way I see to avoid this evil is for the appropriations to be made as now, only with much more liberality, for all the surveying districts, and to appoint one or more competent, skilled, experienced surveyors in each surveying district at a fixed salary (liberal), payable out of said appropriation, whose duty it shall be to enter into bonds and survey the public lands under the orders and direction of the district surveyor-general, making his returns as the deputies do now, receiving a fixed salary whether he is kept busy or not, the surveyor's expenses to be paid by vouchers, with accounts approved by the surveyor-general, out of the regular appropriation, and to hold the surveyor-general responsible, as well as the surveyors and their sureties, as to any fraudulent accounts submitted for payment. This plan would avoid the necessity of "making time" on the survey. The surveyor's pay would be the same whether he run one mile or ten in a day, and as he and his expenses are paid, he can afford to take the time to see that every corner is properly set and marked, and that true distances are given and that true lines are run. I therefore, if any change from the contract system is made, recommend the above plan as the most sensible, practicable, and feasible. The only argument against it will be, I think, the liability of rendering large fraudulent expense accounts and the difficulty of detecting them. I am satisfied that the surveys under this plan would cost something more than under the present plan, and they should in order to insure correctness. The practice of the government of late years has been to decrease the rate per mile for surveying and to more than doubly increase the labor, much of which is wholly useless and tends to impair the efficiency of the service. The manual of surveying instructions and all the subsequent instructions issued need radical amendment and codification.

It would be unwise to consolidate the surveyor-general's offices under one head at Washington. The people of the West would rise up in mass, and say no! The arguments against this are obvious to an unprejudiced mind. The surveyor-general and local land offices should be consolidated under one head. This would save the salary of two officers of $3,000 each and the expense of making the triplicate township plats, save office rent, fuel, furniture, stationery, &c. This consolidation should be entitled and named "United States land and surveyor-general's office." The officer in charge should be allowed a salary of at least $3,500, the chief clerk $2,400. A law clerk, to hear and govern contest cases and give his opinion thereon, and he should be allowed a salary of $2,400. Other clerks could be employed as the service required, with sal-

aries not less than $1,500 per annum, one of which could be placed under bonds and act as receiver. As the money received must tally with the lands sold, there can be no room to make false or fraudulent returns of the cash received. This is my idea of consolidation; but as this plan would cut off a good many fat offices, it no doubt would be violently opposed if a bill for that purpose should ever be introduced in Congress.

The surveys under the deposit system work well. As an inducement to the depositor, the government should allow him a reasonable interest on the deposit money from the date of deposit until the triplicate certificate is surrendered in payment for land.

Desert, grass, pasture, coal, mineral, and timber land should be allowed to be surveyed under the deposit system, and the triplicate certificates received in payment for any land.

The price of desert and pasture land should be reduced. A party wishing to enter desert or pasture land unsurveyed should be allowed to deposit the cost of the survey, and the surveyor to survey the land only which the applicant wishes to enter, without, as now, being compelled to survey all the surveyable land in the township, and the depositor should have, in view of his advancing the money for the survey, some sort of priority of right in entering the land, provided there are no prior legal claims.

It has been suggested that desert, pasture, and grass lands be surveyed in such a way that each claim shall have a certain water front on a stream, lake, river, &c., making the center of the stream the dividing line between the claims, and the claims running back from the stream in such a way and in such a shape so as to include the land sought to be entered by the claimant. This plan would cause a departure from the rectangular system, which, as I have before remarked, would create confusion. My idea is to survey the lands sought to be entered by the claimant, under the deposit system, by section, township, and range; and if found necessary by the surveyor to subdivide into 5, 10, and 20 acre lots, and then allow the claimant to enter such lands as he requires, up to two sections more or less, whether in compact, contiguous form or not.

The present law governing the deputy surveyor in the field, requiring him to survey only certain surveyable lands and holding the surveyor-general responsible for such surveys, is difficult to follow, and should be repealed. How is a deputy to know what kinds of land his contract may cover? He cannot afford to go into the field and run lines of reconnaissance in advance of the letting of the contract to see if the lands are surveyable under the law. Neither can the surveyor-general do this; there is no law for it, no way he can be or even his expenses be paid, yet the law holds him responsible for the surveys, if they include lands other than those contemplated to be surveyed under the law.

It is true the law allows the surveyor-general to go out and inspect the surveys during their progress or after they are executed. This interferes with his office duties, and therefore he must examine, in a few days or weeks at most, the surveys which required three, four, six, or eight months to execute in the field. Such an examination is necessarily superficial and unsatisfactory, and really amounts to nothing.

My idea is to let the contracts—if the contract system is adhered to—and to allow the deputy to survey all the land covered by the same which he can chain and run over, whether it is arable land or not. This would save the uncertainty and confusion which now exist in the surveys and in the adjustment of the deputy's accounts. All the land must be surveyed sooner or later anyway, and it will cost no more now than it will fifty years hence; as a proof of this, the surveying rates are no more now for lines in open country than they were fifty years ago.

The following bill should become a law; it would save settlers much expense and litigation:

"H. R. 3880.

"A BILL to authorize the resurvey of lands where the surveys are fraudulent, erroneous, or obliterated, and to legalize a certain resurvey.

"*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That the Commissioner of the General Land Office be, and he is hereby, authorized to resurvey the subdivisional lines of townships that were public lands and have been disposed of by the United States, and also public lands which remain undisposed of, when applied to for that purpose by a majority of the settlers being land owners in any township who have obtained titles to their lands, where the original surveys were made by United States deputy surveyors, but are proved, to the satisfaction of the Commissioner of the General Land Office, to be either fraudulent, erroneous, or totally obliterated in the field. The said Commissioner shall have the power to cause such lands to be resurveyed by a competent United States deputy surveyor, under the immediate direction of a United States surveyor-general; and where there is no such surveyor-general by reason of his office having been discontinued under the provision of section 2219 of the Revised Statutes of the United States, in that case the resurvey hereby authorized shall be executed by an experienced surveyor familiar with the system of the public land surveys, and to be designated by the county

commissioners or board of supervisors of the county in which the lands are situate, or by a majority of the voters of the township or townships embracing said lands, to be ascertained in such manner as the said county commissioners or board of supervisors shall direct, subject to the approval and the immediate direction of the Commissioner of the General Land Office; the resurvey to be executed in conformity, as nearly as practicable, with the field-notes, the lines, and corners of the legal subdivisions shown on the plats by which the lands were originally disposed of: *Provided*, That in the making of said resurveys no recognizable landmark or monument of the official surveys which mark the corner of any lands already disposed of by the United States Government shall be moved or disturbed, but, when so found, the said monument shall be renewed, and to be perpetuated as the landmark of the resurveys.

"SEC. 2. That the cost of the resurveys herein authorized shall be paid by the aforesaid land owners under the deposit system provided for by sections 2401 and 2402 of the Revised Statutes of the United States: *Provided*, That the whole expense of resurveying and marking the lines shall not exceed $12 for every mile that shall be actually run, surveyed, and marked. And the plats of such resurveys shall be constructed in strict conformity to the field-notes thereof, and the description and contents of legal subdivisions shall be conformable thereto, be the acreage of the subdivisions more or less than that expressed on the original plat of survey by which the lands were disposed of.

"SEC. 3. That it shall be the duty of the surveyors-general of the proper surveying districts to transmit approved township plats of the resurveys hereby authorized to the registers of the proper land offices and to the Commissioner of the General Land Office, to be filed with duplicates and triplicates of the original plats.

"SEC. 4. That a resurvey of township ninety-six north, range fifty-one west of the fifth principal meridian, in Dakota Territory, as executed by H. J. Austin, at the request and cost of settlers therein and to their entire satisfaction, is hereby legalized: *Provided*, That the field-notes of the resurvey, when submitted to the surveyor-general of Dakota Territory, shall be found by him to have been executed in conformity to the existing laws, and in accordance, as nearly as may be, with the legal subdivisions of the original plat of the survey by which possessory rights may have been acquired by the settlers."

The government should advance a certain sum to deputy surveyors, before entering upon their work in the field, to enable them to meet the expense of their outfit without borrowing money from the banks at exorbitant rates of interest. This amount could be deduced from the accounts of the deputies, when the same were adjusted. The money advanced should be sent to the surveyor-general, and through him paid to the deputy, under proper instructions, or paid on checks of the deputy, for supplies, &c. The deputies and their bondsmen would be, of course, held for the money so advanced. This has been the practice in other countries, especially in Germany, and I am told that the practice was never abused.

SURVEYOR-GENERAL'S OFFICE.

The salary of the surveyor-general should not be less than $3,000 per annum, and the chief clerk's salary in all important districts should be raised to $2,000 per annum. The appropriation of $1,500 for contingent expenses for the office in Utah is much less than that required to run and keep the office in good shape. An appropriation of $2,500 for that purpose would be about the proper sum required annually. The appropriation for clerk-hire in the Utah office of $3,000 falls short of even paying the chief clerk and chief draughtsman; the deficiency thus created, and the salaries of the other three clerks, must therefore be paid out of special deposits when such deposits happen to be sufficient for that purpose, which is not always the case. The surveyor-general should be allowed to make certified copies from his records, and be permitted to charge 22½ cents per folio for manuscripts and, say, $3 for copies of full township plats, and $2 for fractional.

PRE-EMPTIONS.

The decision of the United States Supreme Court in the case of Atherton *vs.* Fowler (6 Otto 513), virtually annulled the law requiring filings or entries to be made within three months in certain cases. It seems from that case that any person can settle upon the public domain and improve it without filing or applying for a patent, and hold the land against the world for any length of time. The decision and the statute should not remain in conflict.

FILINGS.

Where a party files a declaratory statement for a certain tract of land, and does not, from some good cause, carry his filing to final entry, he should be allowed to file again, provided he did not sell his right to the land described in his first declaratory state-

ment. As the law allows a person 160 acres under the pre-emption laws, he should be allowed to make a second pre-emption if his first entry was for a less quantity than 160 acres.

REPAYMENTS.

The law, as it now stands, allows repayments only when the land sold was illegally sold, or words to that effect. The law should be so amended as to allow repayments to claimants in every instance where the claimant, for any reason, could not obtain his patent. There are hundreds of cases where one party has proved up, paid his money for the land, and obtained his final receiver's receipt; in the mean time, before receiving his patent, his entry is canceled for some cause; then another files upon, enters the same land, and pays again the same amount of money for the land that was paid by the party who first entered. I hold this to be absolute robbery, and any one with common sense will say so, and recommend that the law ought to be amended and made retroactive.

PRE-EMPTION PROOFS.

The law now allows pre-emption proofs on final entry to be made before a county clerk, but compels the claimant to come into the land office to make his affidavit, no matter how far away he lives (often as much as 300 miles), while in homesteads the final proofs and affidavits can all be made before a county clerk. This is very inconsistent and absurd. The pre-emptor should have the same privilege as the homesteader, and therefore the law should be so amended as to allow the former to make his affidavit before the county clerk or a notary public anywhere in the land district in which the land sought to be entered is situated. I do not see why an oath is not as binding before a notary public as before a county clerk; and another thing (it is often so in this western country), that the counties are so large that the clerk's office is as far away from the claimant's land as the local land office, whereas a notary public could be in any isolated settlement.

County clerks should not be allowed to make out filings and entry papers for claimants and act as attorneys for them in any case. The local land officers cannot do so; then why should the county clerks have more authority than the register and receiver? Please have a law passed to this effect. County clerks make more blunders, any way, in land entries than any one else. This is patent to any one who has ever been familiar with the land laws.

HOMESTEADS.

The law governing homesteads should be as liberal to the settler as are the pre-emption laws. A pre-emptor is not required to make oath when he files his declaratory statement; therefore why should a homesteader? It does not make his first entry any more binding, as I take it. Make a law to allow both sort of claimants to file their declarations without being sworn, and let the final proofs cover the whole ground of proof as to residence and cultivation or improvement, the same as now done in cash entries. Where a party has made a homestead of less than 160 acres, he should be allowed to make another entry covering the deficiency up to 160 acres. Where, from some good cause, a party has filed a homestead, and for such cause cannot carry it to final entry, he should be allowed to enter again, provided he has not sold the land covered by his first entry.

Notaries public should have power to administer oaths in all homestead cases for the same reason as given under head of pre-emptions.

The following paragraph (page 6 of circular General Land Office of October 1, 1878) should be amended by law so as to read thus:

"Where the applicant is prevented by reason of bodily infirmity, distance, or other good cause, from personal attendance at the district land office, the affidavit may be made before the clerk of any court or notary public for the county or in the district within which the land is situated, under section 2294 of the Revised Statutes."

A homesteader who makes entry at the local office does not swear that he lives on the land. Then why, I ask, should he be compelled to do so before a county clerk? This is an inconsistency in the law which should be amended.

CANCELLATION.

When a claimant files his relinquishment of his homestead the land covered by said homestead should be made open to entry at once, without waiting for months for the cancellation to come back from Washington. Such a rule as this would facilitate business very much.

CONTESTS.

Where a party brings contest for abandonment, or any other cause, and the entry against which he brought the contest is canceled, the contestant should have thirty or

sixty days in which to file on the land. I think this nothing but justice. Many more contests would be instituted if the law was so amended, and many fraudulent entries thus prevented.

WITNESSES.

The witnesses in contested cases should be compelled to attend at the land office at the hearing. As the law now stands witnesses can attend or not. It is entirely optional with them. Many a contestant, and even defendant, have lost their cases because of this defect in the law.

COSTS AND EXPENSES.

The law compels the contestant to pay the expenses of contest. This is unjust. He should be required to pay the costs at time of hearing; but if the case was decided in favor of the contestant then the cost to be collected from the defendant by due process of law with which to reimburse the contestant for the amount advanced at the time of trial.

DATE OF HOMESTEADS.

Homesteads now date and take effect from the date of entry only. Why should not a homestead entry relate back to date of settlement just as well as a pre-emption? If a claimant has been living upon his claim for five years or over when he comes in to make his entry, why not let him have credit back for the five years, and not compel him to live five years longer? He might have settled upon unsurveyed land, and have lived thereon for twenty years, but could not make his entry until the land was surveyed and the triplicate plat filed in the land office. Now, as soon as the plat is filed he comes to make his entry, and as he has lived on the land over five years he asks credit for that time at least, and permission to make final proof at once without making the usual first entry. Should not his request be granted? This would only be simple justice to the hardy pioneer. Therefore, please have the law amended to cover such meritorious cases.

PUBLICATION.

The late law requiring claimants to publish a notice of their intention to make final proof is onerous, useless, impracticable, and should be repealed. What is the intent and aim of such a law? It does not require the claimant, nor does it authorize him, to state in his published notice to all the world to come in and file an adverse claim within the thirty days else all claims will be barred, &c. It does not even authorize the register or receiver to receive and file an adverse claim, and stay proceedings or order a hearing. I therefore ask, of what use is such a law? It benefits no one except the editors of one-horse country papers, who charge $5 for publishing each notice of final proof. It is unjust to the settler, and just doubles the cost of making his final proof. But the worst feature in the act is to compel the claimants to name their witnesses in their published notices. We will state a case: Suppose A publishes notice that he intends to make final proof, and names B and C as his witnesses. After the thirty days' publication is up A searches for his witnesses, but cannot find both or even one of them. They may have died, got drowned, hung; may be in jail, penitentiary, or insane asylum; may have skipped the country between two days. This, you see, places A in a quandary. What is he to do about it? The local officers hold that Mr. A must make a new publication, and name two more fresh witnesses from the country. He does so, and at the end of the thirty days Mr. A again searches for his witnesses, but to his dismay or "bad luck" the witnesses are "non comatibus" a second time. What must poor A do now? The register would tell him to "try again," and keep trying until he brought in the two live witnesses, whose names were published in some little obscure country paper, away down in some obscure corner, with smashed type and pale ink, simply to comply with the law, which says that the notice must be published in the newspaper published nearest the land. I trust the honorable Commission will recommend the repeal of such an absurd law.

SOLDIERS' HOMESTEADS.

An old soldier or sailor should be allowed to enter 160 acres as a homestead by cultivating and improving the land without compelling him to live on the land in person —allow him to employ a man to reside on the land and improve it by proxy. I don't think any loyal person would object to such a provision in the homestead laws.

Section 2306, Revised Statutes, should be amended by striking out the words "may have heretofore entered," and insert in their place *have heretofore or may hereafter enter.*

TIMBER CULTURE.

The law requires that not less than 2,700 trees per acre must be planted on a timber entry, and when final proof is made there must be at least 675 living and thrifty trees to each acre. The great difference in these numbers induces me to think that there must be an error in the original number of 2,700. I think it advisable to recommend that said number be reduced to 1,350.

DESERT LANDS.

Where a desert claimant has made reasonable effort to get water upon his land and has failed to do so within the three years, he should be granted further time to make his final entry. Desert entries should be assignable.

TIMBER LANDS.

Pre-emptors and homesteaders who still reside upon their original entries should be allowed to purchase 40 or 80 acres of timber lands situated anywhere in the land district.

ACCRETIONS.

The lands of this class, regarded as accruing to the public domain by reason of the recession of the waters of meandered lakes, sloughs, and ponds, was treated of in the report of the honorable Commissioner of the General Land Office for 1878, page 138, in which he recommends that such lands be conveyed to the States, &c. This is all correct as far as it goes, but he says nothing in regard to such lands in the Territories. A law should be passed authorizing the survey of such accretions outside of old meander lines in the Territories under the individual deposit system, and allow the land to be entered as other lands.

ROCK QUARRIES.

There is an uncertainty in the law as it now stands in regard to the entry of quarries containing building-rock, unless it is marble or limestone. The law should be made more definite on this point.

MINERAL LANDS.

Locations.—Where a person has made a discovery and decides to locate his claim, he should have the surface lines run by a United States deputy mineral or other surveyor, and fix the *locus* of the claim by metes and bounds, with proper reference to natural, permanent, and local objects. After this is done let him write out his notice of location in duplicate, in conformity with the survey notes, post one notice on the claim and send the other to be recorded.

Recorders.—The office of district recorder should be abolished, and the notices of location should be filed in the local land office within the district where the claim lies. A proper form for notices should be drawn up by the honorable Commissioner and furnished the local offices for use of miners. This would preserve uniformity in all location notices.

Width and length.—Claims should be fixed at some definite width and length, say 660 feet (one-eighth of a mile) wide, and 1,320 feet (one-fourth of a mile) long, and should not be restricted by any local or district laws to a less quantity for lode claims, but allow the locator as much less than this as he sees proper to locate, and in all cases confine him to the mineral and land contained within the vertical side and end lines extended downward. This provision will avoid much expensive litigation, and the only thing that ever will. The end lines should be parallel, as nearly as may be, but where one claim butts up against another the course of the end lines may be governed by the course of the intersecting claim.

Publication.—The time of publishing notices for applications for patents should be shortened from 60 to 30 days, and no notice should be published in a country newspaper whose life is uncertain, notwithstanding the paper is the one published nearest the claim. The register and receiver should be the judges of this fact.

Deposits for office work.—Certificates of deposit for office work on mining claims should be made receivable by the receiver in part or whole payment for the land sought to be patented, and such certificates should be made assignable and used the same as certificates of deposit for agricultural surveys. This seems to be simple justice. As the law now stands it makes "fish of one and fowl of the other."

Deputy surveyors.—Deputy surveyors should have authority to administer oaths to their assistants and to parties who make affidavit of the identity of the claim, and the

proof of improvements; they should also be authorized to administer oaths in taking testimony mentioned in Circular N of the General Land Office of November 20, 1873.

Applications.—The practice of claimants of making applications for mineral lands by an attorney in fact has lately been overruled by the Acting Commissioner's decision in case of George S. Dodge, in Copp's Land Owner for November, 1879, page 122. I see that the law clearly sustains the decision. Mine owners may own claims in Utah and reside in New York, or some other distant port or inland town, yet the above decision requires them to come to Utah, at great expense, inconvenience, and loss of time, simply to sign and swear to their applications, when their agent, duly authorized, could do the same thing as well as the claimant, and in many cases much better. The ruling requiring the claimants to swear that their notices remained posted during the 60 days' publication is onerous and unjust, and should be set aside. If these two things remain in force it will materially impede the miners from making applications for patent. Such requirements are inconsistent with sound sense and good reason and the spirit of the times in which we live. Therefore the law should be promptly amended so as to allow claimants to apply for patents either in person or by attorney in fact.

Procuring titles.—The length of time consumed between paying for both agricultural and mineral lands and the issuance of a patent for the land entered is from one to two years, and, unless the claimant employs an attorney in Washington to hurry up his case, the time may be further extended. It requires two or three years to get a final decision on a contested land case. There would be many more contests brought against attempts to make fraudulent entries if a decision could be arrived at in such cases without so much delay. No doubt that this is partly or totally the fault of Congress in not making sufficient appropriations to carry on and keep up with the current work in the General Land Office. That sort of economy is false, and is an injury to the country as well as the individual who expends his means, labor, and life in the development of the agricultural and mineral resources of the great West.

Mineral protests.—The register and receiver should have authority to reject any protest if, after examination of the papers and hearing the evidence in the case, they find the grounds insufficient to support the same in law or equity. If in their opinion the grounds taken are good, let them so advise the defendant, so he can commence suit in court within 30 days from such notice. I don't really think it practicable to have contest in mineral cases referred to registers and receivers for judgment and decree, with the same force and binding as a decree of a court. This would require those officers to be learned in the law (which many of them are not) to sit in judgment on cases involving, frequently, millions of dollars. If a mine is of any moderate value the claimants can well afford to sustain the cost of a suit in a court of law having competent jurisdiction by which to defend their rights.

Overlap.—The practice of allowing claims to be surveyed which overlap one another should be discontinued. This evil is the source of much trouble and delay in working up the returns of the surveyor after reaching the surveyor-general's office, and if permitted to go on, as heretofore, the intersections will become finally so confused and mingled together, like cobwebs, that an expert would be unable to determine one claim from the other. This could be obviated by obliging the parties in interest to settle all conflicts in court before the surveyor made return to the surveyor-general. Such returns should be accompanied with a certified copy of the decree of the court. Such returns should be made in conformity with the decree, that is to say, the surveyor should return his notes giving the metes and bounds of the land which the court may decide belonged to the claimant, whether the end lines were parallel or not.

Where an application for patent shows none, or has no conflict on the day of filing in the local land office, but during the publication a protest is filed and carried to final decree in the courts, and decided in favor of the protestant, then the party who made application for patent (with his map clear of conflict) should be compelled to file an amended survey and field-notes, with the area in conflict, as found by the court, left out. This plan would not only greatly relieve the work in the surveyor-general's office, but it would wonderfully relieve the department in adjusting claims, and save so much delay in issuing patents.

If the foregoing suggestions are ever carried out, the laws pertaining to the public surveys and entry of lands will be as near perfect, I think, as it is possible to make them.

My duties, on account of press of business, have unavoidably delayed me in the compilation of this paper, but I trust it will not reach you too late to be of some service to the honorable Commission, and through it to the general public in the great West.

Respectfully submitted,

T. C. BAILEY,
Chief Clerk Surveyor-General's Office, Salt Lake City.

Capt. C. E. DUTTON,
Secretary Public Land Commission.

Testimony of General M. M. Bane, receiver, Salt Lake City, Utah.

General M. M. BANE, receiver, Salt Lake City, Utah, testified on September 10, 1879, as follows:

I have heard the statements made by Mr. Niel and concur in them, but I would like to make a suggestion in regard to the timber lands. If they are to be disposed of they ought to be disposed of in alternate tracts, the alternate tract to be owned by the government, and the persons who bought a tract would protect the timber lying on each side of it. This would keep the timber supply a long time. The fires that are now raging among the timber result from three prominent causes—the hunters cause much fire by recklessly starting it in the timber to drive out their game; then the miners build fires recklessly; and the Indians sometimes set fire to the trees.

I have been very much impressed with the idea of making square locations of mineral claims, that is confining the claimant to the end and side lines. This would avoid litigation. Nine-tenths of all the locations in this Territory are made less than 200 feet wide and 1,500 feet long, that is 6.88 acres. In regard to the work of mineral surveys, the register and myself had been informed by Mr. Lawrence, a very responsible gentleman who obtained patents for two mines, that when he went to look for them he could not find their location at all.

Testimony of George O. M. Boutelle, civil engineer, Salt Lake City, Utah, deputy mineral surveyor and late deputy surveyor of public lands in Colorado and Utah.

Memoranda of changes suggested to be introduced in the practice of surveying the public lands of the United States.

To avoid as far as possible the always hurried and sometimes incomplete manner in which the work is done, and at the same time to accomplish a greater amount of work in a more thorough and substantial form, and at no greater expense to the government than at present practiced under the contract system, and to amend the "manual of instructions" so as to authorize the deputy surveyor in the field to do the work in the most convenient and economical way, the following plan is proposed to accomplish the desired result, viz:

The appointment of a competent surveyor of experience, with the pay and emoluments of a major of engineers, to be known as a deputy surveyor-general, whose duty should be to make himself perfectly familiar with the characteristics of the whole surveying district; to carefully ascertain by the closest personal examination and observation the necessities of the present and prospective population, with a view to the judicious and proper expenditure of the appropriation for public surveys for each year where it will be of the greatest good to the greatest number of actual settlers upon the unsurveyed lands where the wants of the people most require it, instead of expending the whole or a large portion of the money set apart for surveys in extending the lines over vast areas of worthless lands not susceptible of irrigation, and with no prospect of being required for occupation by a population for many years to come. The deputy surveyor-general should also be required to visit the parties operating in the field to satisfy himself by personal observation that the work is being performed in a proper manner and with due diligence.

To more fully inform himself regarding the character of the country and the proper places in which to locate the surveys for the ensuing year, the deputy surveyor-general should remain in the field after his inspections of the work of the regular field parties have been finished to run a sufficient amount of meridian and standard lines to enable him to judge of the amount required for surveys the following year to keep pace with the constantly increasing and expanding area occupied by the population, for the information of the surveyor-general, The deputy surveyor-general should be required to give bond (in the same amount as is now required of deputy mineral surveyors) for the faithful and honest performance of his duty and the proper disbursement of public funds committed to his charge.

The officer in charge of the surveying parties in the field and to whom is confided the duty of running, measuring, and marking the lines upon the ground, should be regularly employed (after passing a satisfactory examination before the surveyor-general and deputy surveyor-general) during his term of service in the field, with the pay and emoluments of a captain of engineers, and be required to give bonds for the faithful performance of his duty and the proper expenditure of such public money that may come into his possession.

The incidental expenses of parties in the field should be paid by the surveyor in charge of the party, who should be furnished with money for this purpose by the surveyor-general (from a small portion of the annual appropriation to be placed to his

credit for this use) to be properly accounted for by duly certified vouchers. The operations in the field should be confided only to those who would do a reasonable amount of work in each day, so as to make the expense to the government no more than it is now under the present contract system with the same amount of work performed and removing every inducement to the deputy-surveyor to slight his work in order to save himself expense, by employing him as a salaried officer instead of by contract as at present.

The poverty of the present "manual of instructions" in the matter of general instructions applicable to a mountainous country is manifest, and the necessity for which seems to have been lost sight of in the multiplicity of minor and unimportant details to the exclusion of instruction and valuable generalities. Many cases arise where the deputy surveyor is required to exercise his own judgment where no parallel case is given that could be made applicable, and although the work may be perfectly correct as far as the location of the corners is concerned, the deputy surveyor runs the risk of having his work returned "disapproved" and unpaid for because it was not exactly in accordance with any precedent set forth in the manual. The deputy surveyor should be left to a certain extent to the dictates of his own common sense, and if he be an officer of science, as he should be, methods of measuring the lines and establishing the corners at their proper place will readily occur to him without following exactly the manner of procedure indicated in the manual.

The present law requires that each of the north and south lines in the subdivision of a township shall be exactly eighty chains in length, except those closing on the north and west boundaries, and the limit of closing of the east and west lines, except those on the west tier of sections, is one hundred links. Instances often happen where it would be vastly more convenient and accurate to run west from the east boundary and then closing south on the southern boundary within the prescribed limit, returning and correcting the position of the quarter-section corner. In many cases time may be saved, and what is still more important greater accuracy may be attained than in following the despotic rule to require all lines bounding sections on the east and west to be run north. Should not the surveyor be left at liberty to run the lines north, south, east or west, as the case may be, requiring only that any two of the four sides of a section shall be equal and parallel? For convenience of reference the field-notes should be arranged as is now practiced, but the operations in the field need not be conducted in the same order as therein arranged where there would be increased accuracy by a departure from it. To the writer of this memoranda it occurs that next in importance to the proper establishment of the boundary monuments on the lines of the public surveys is to render them as permanent as practicable without too great an expense and to mark them in such a way as to be an improvement on "notching the stone corners" and intelligible to any explorer of ordinary intelligence. In townships where stone corners abound and where no posts are used it has frequently become necessary to retrace the lines of the old survey where all the stone corners were found to enable the surveyor to identify the township and range in which he was operating.

The writer would respectfully suggest that the corners may be marked in the following-described manner, to wit, by a stake two feet long and two inches square, and pointed on the lower end and driven into a hole in the ground prepared for that purpose at the exact corner point, the top to project one foot above the *natural* surface of the ground, to be entirely covered by earth thrown up from the pits, as now provided by law; the identity of the corner to be stamped upon a thin piece of sheet copper or zinc and nailed to the top of the stake with copper fastenings before the construction of the mound (and after the stake had been driven), which is to cover it and serve as its protection from fire or other causes tending to its destruction. The top of the mound raised two feet above the natural surface of the ground would cover the stake one foot on top, and would be sufficiently prominent to be easily found and less liable to be destroyed by the scratching of cattle against the post, as is often now the case. Whenever it becomes necessary to inspect the marks upon the little metallic card upon the top of the stake to ascertain its identity, a portion of the top of the mound could be removed, and after the examination carefully restored to its proper place on the mound. Corners of more than ordinary importance, such as points of intersection of base lines or standard parallels, with the principal or other guide meridians, may be marked with posts 2½ feet long and 2½ inches square. Section and all other corners, except quarter-section corners, to be two feet long and two inches square for the posts, the quarter-section posts to be two feet long and 1½ by 2 inches on top; this difference would also serve to distinguish the quarter section from the section stakes in the absence of any marks. Attention is invited to the following diagrams designed to illustrate the manner of marking the metallic cards to be placed on the top of the posts or stakes. It will be observed that the order of the arrangement of the marks on the cards is so unlike in the several cases that if one-half of the marks had been obliterated by time enough could remain to convey to an intelligent examiner their proper import, and enable him to determine what they were designed to represent.

Care being taken to so arrange the edges of the metallic cards that they shall be in the direction of the cardinal points of the compass, a general idea of the direction would thus be furnished to the investigator in the absence of any instrument with which to determine the direction of the lines.

The foregoing brief and imperfect outline of changes that might prove of advantage to the surveying service have occurred to the writer of this paper after an experience of more than a dozen years, partly in the field and partly in the offices of the surveyors-general in Colorado and Utah. It is respectfully offered for the consideration of the honorable Board of Land Commissioners in response to a published request for suggestions of this character.

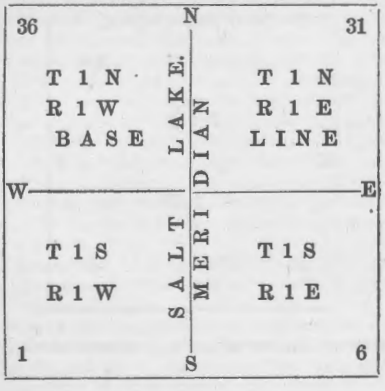
I have the honor to be, gentlemen, your obedient servant,

GEO. O. BOUTELLE,
Civil Engineer, Deputy Mineral Surveyor and late Deputy Surveyor of Public Lands in Colorado and Utah.

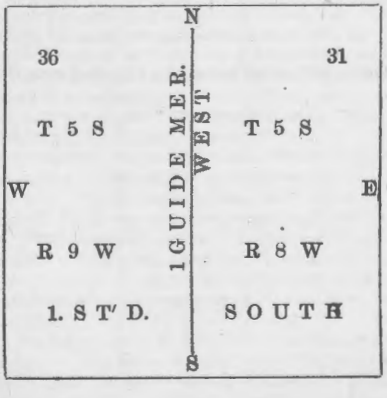
Captain C. E. DUTTON,
Ordnance Corps United States Army,
Secretary Land Commission, Salt Lake City.

SEPTEMBER 10, 1879.

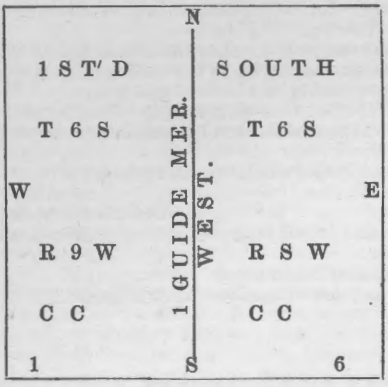
Intersection of the base line and Salt Lake meridian, to illustrate the design for marking the corners.



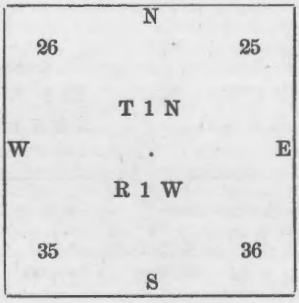
Regular corner on standard line, to illustrate manner of marking.



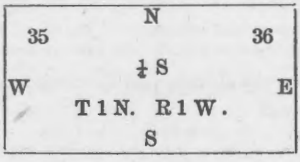
Closing corner on standard line.



Interior section corner.



Quarter section corner on a north and south line.



Quarter section corner on an east and west line.

NOTE.—One and one-half square feet of sheet copper or zinc would furnish the necessary metallic cards for marking all the interior section and quarter-section corners in a township in the manner described above.

Testimony of M. T. Burgess, civil engineer and mineral surveyor, Salt Lake, Utah.

MICAJAH T. BURGESS, a civil engineer and mineral surveyor, resident at Salt Lake, testified September 7, 1879, as follows:

Have been familiar for ten years with the practical operation of United States land laws relating to lode claims. The practice of permitting mineral surveys to overlap is objectionable, because tending to confusion and litigation. The making of such overlapping surveys is, however, a necessary incident of the present system of location which permits of such original overlapping, and hence necessitates a similar conflict in the subsequent official surveys. So long as miners are permitted to make vague locations, as at present, and to follow their lodes wherever they run, conflicts will occur.

The common acceptation of the term apex is its highest point at any given place. The word presupposes a dip, and the highest point of a lode at any given place is hence its apex. This must be true in all cases where a lode has a dip, but there would be no apex to a horizontal lode. In case of dip there may be a series of points. In a vertical vein there would be a series of points also.

In Utah it is rarely the custom, in the early workings of lode claims to endeavor to determine the apex or cross or angle of a lode or vein, and it would be very difficult to apply a rule for the ascertainment of either uniformly. While there are some cases where it is a very easy matter to determine the dip of a vein without doing much work, generally it is impossible to do so without going at least 100 feet in depth upon it.

In view of the fact that under existing law the term apex, cross-angle, variation, &c., are essential parts of the law and in view of the further fact that the information necessary to determine the facts called for by these terms cannot generally be ascertained in the early location of a claim, in my judgment the rights of a locator are not sufficiently defined under the present law; and in a majority of instances they cannot to a reasonable extent be protected under existing law. Right here let me explain a little: The law seems to require that the locator of a lode marks his location on the ground very soon after the discovery, and the law allows the miners of a district to regulate the width of the surface ground within certain limits. Suppose the district law then requires that 100 feet in width shall be all that is allowed a locator and that very soon after making the discovery he stakes his boundaries. He is just as apt as not to get his location at right angles to his vein as to get it longitudinal to that vein. If he gets it at right angles he gets 100 feet of vein; if fortunate enough to get it run right he gets 1,500 feet. In the former case under decisions in this Territory he would lose all but 100 feet of his vein.

Since the passage of the act of 1866 or 1872 it is in my opinion impossible to determine the apex, cross-angle, &c., at the time of locating a mine, and much litigation has grown out of that impossibility.

I have known two seams running parallel or approximately so, being located by different parties, resulting in contests. I think a case of that character was decided here in court yesterday, that of Stuart *vs.* Edison. (Witness here entered into a lengthy description of the geology of the country and the location of the veins in controversy not relevant to the matter under discussion.) Continuing the general testimony he had not known of any instances in which the first locator had been cut off by the second locator.

Sometimes the outcrops of lodes are wider than the legal width of claims, whether as defined by United States or Territorial laws or local district regulations. This is so of the Flag Staff, South Star, and Little Cottonwood.

Sometimes the outcrops of narrow lodes so deviate from a straight line as to pass beyond the side lines of claims. Of this the Red Rover, in Bingham Cañon, is an example; and I know of a good many instances where the vein deviates from the course of location so as to pass off the location, but it does not come back. The Red Rover seems to run off and then run back. Generally the difference that troubles is merely in the direction of location of the lode.

In reply to a question whether it is practical, under the law, to secure the location of alleged lodes where mineral cannot be worked to advantage, but greatly to the disadvantage of discoverers of true lodes, witness said: The question is correctly put as predicated upon a matter of general practice, although upon the requirements of local laws it is not. Local laws, as well as the United States mineral law, require that a man shall have discovered a lode, but they unfortunately leave the proof of discovery entirely to him, and as a matter of practice there is no restriction upon a man's taking up a lode claim upon absolutely barren ground. He simply has to come in and file his application, and claim so and so. Whether he has found mineral or anything else there, rests in his own breast, and it is left to him to say whether he has or has not, and he is given a license. This state of things works very much to the disadvantage of the real discoverer of a lode and to the advantage of blackmailers who make locations of something they allege to be veins, evidently for the purpose of getting money out of parties who think they have good mines. They simply make their locations for the purpose of acquiring fighting claims. In answer to No. 12 of questions relating to

lode claims, witness said a man could cloud the title of the true discoverer of a lode, and cause him an expensive litigation, but should not be permitted to do so. To show how this state of things might come about, and what difficulty the true discoverer of a lode would be put to in order to determine the identity of the true lode, I will say that B would allege that he had a parallel vein to A's, and would sink down until he passed into A's vein. In many instances he would sink through country rock and allege he was sinking on his vein matter; and finally, when he cut through into A's vein, he would begin to extract ore; and A would be compelled to show that his point of discovery and drift was upon the vein when B had entered his vein, and then prove in court, by expert testimony, that the other party could show no ore extracted between his alleged discovery and the point where he had entered on A's ore. This operation would cloud the title of the true mine for many years, probably. Witness answered affirmatively to No. 13, lode questions. In the event of litigation, as a rule, it is mostly over that portion of the vein which has passed beyond the exterior lines of the surface ground of the claim; but there are such variety of causes that there can be no rule stated. In the majority of cases, however, the contest undoubtedly results from the dip of the vein beyond the side lines—the plane lines. As a rule, and as a general thing, ore is taken out on the dip outside the plane line.

I doubt very much if it is possible to retain in the mineral law any provision by which locators could follow the dip of their claims outside their side lines without provoking litigation. There are so many excuses for litigation, so many crooks in practical mining, that I doubt if it would be possible to do away with litigation, so long as you allow men to go beyond the plane of their side lines on the dip of the lode. Conceding that under the present law the right to follow the dip is provocative of litigation, I can think of no safeguards that would prevent such litigation, or even its excessive increase.

Witness had never taken any part in organizing mining districts, and was only familiar with the mode of organizing them by description. As he understood it the question of citizenship need not necessarily enter into consideration in forming a district. Prospectors often travel in groups of three and upward, and they have an understanding or a rule among themselves that three of them have the right to organize a district and pass laws. They wander over the country and find something they want to record, and they organize a meeting, with perhaps only three persons. One of them becomes chairman of the meeting, another secretary, and they will proceed to appoint committees for the drafting of by-laws for the government of that district, and the committee will write out his notions of the boundaries of the district, and what the laws and regulations for the government of mining in that district should be, and these are presented to the meeting and adopted. Then one of the three is elected recorder, and instructed to get books to record claims in, and business begins. There is no safeguard to prevent the overlapping of districts and consequent conflict of authority, except that arising from the knowledge of other districts those meeting together may possess, and it is a mere chance of their possessing any. They generally take natural objects for their boundaries. I believe the requirements as to number of persons qualified to organize a district is a matter of custom and not of law; and it is only custom which requires that the organizers should be miners at all. The understanding seems to be that all prospectors are miners, and persons organizing a district are likewise assumed to be miners. I understand it to be true as a rule that districts are formed by small parties of prospectors, though sometimes they are organized by meetings of which notice had been previously given to miners, &c. In the absence of organization of a district, a man desiring to locate a claim would dig a hole and hold it with a pistol, and would be governed by the dimension of his claim in posting up his notice, though I doubt if miners often post notices of their claims in the absence of a district organization. I believe they generally follow the custom of the last district in which they worked.

I have never known of any evidence of citizenship being required in the organization of these districts. I do not know of any law where citizenship is mentioned as a necessary qualification in those banding together to form a district. Such meetings generally elect a recorder, whose duty it is to keep a record of all claims that may be presented for record and to provide himself with books for that purpose, for which service he shall have a certain fee. Under the law he has to record a claim when it is filed for record. Sometimes the laws provide that he shall visit the claim after the notice is presented for record. That is not always done. As a matter of fact, the recorder records anything that is presented to him, for which the fee is paid. The object in keeping the book of record seems to be that there may be something perpetuated in writing to show that a party making a location has located the ground, and then the record is intended as a notice to other prospectors of that particular piece of land being occupied or claimed. There is generally provision made in the law that recorders shall keep their books open for inspection at all reasonable hours. What good it does I do not know; but unless there was some provision many locations might be made on top each other. A copy of that record of location, certified

by the mining recorder, is the foundation of the entire proceedings to acquire a mineral patent from the United States, and is evidence in any legal proceedings that may be instituted concerning that claim.

In answer to No. 16, questions on lode claims, witness stated that any man who wants to locate a piece of ground takes a piece of paper and writes a notice, perhaps the best he knows how, and takes it to the district recorder's office and files it with the record, paying $2, which is the fee in most cases; and if that notice is found to be very imperfect, in some instances it is modified by the district recorder, at the request of the locator, so as to make it conform to what the district recorder believes to be the requirements of the act of Congress. Some district laws say the locator shall erect a monument and two stakes of a certain size, and I think some of them go so far as to say they shall do certain work, but as I understand it that is not the rule, and those forming districts now very generally insert a clause in their district laws adopting the United States law as the general guide, and only make rules for matters of details. The filing of the certificate or notice with the recorder is the main thing. The filing of the certificate does, I believe, hold the point of discovery against other parties until the locator leaves the ground, and then just as likely as not another party will make another location that will take in this point of discovery; but so long as the original party is on the ground that notice is apt to be respected. That notice is the foundation of all subsequent proceedings relating to the title of the claim, and it is the first step toward obtaining a patent for the land. In the matter of any controversy respecting boundaries, the controversy would also hinge upon that certificate, and I believe that the litigations necessarily occurring in relation to mineral titles are enormously increased by the illiterate or careless manner in which these locations are originally drawn.

I do not personally know if that record is capable of subsequent amendment (after it is filed), but have been informed by some district recorders that they would allow any record of location to be amended, if the party making the location should apply to do so within a reasonable time; and it is subject to amendment at any time by filing what is called an addendum notice or additional description of the ground. I have known that to be done in cases where the claim was several years old. The original notice is not necessarily touched or mutilated by this amendment. In many cases after the original notice of location is recorded the party wants to furnish the public with an additional description of the ground, and he files an amendment notice and that is also recorded and forms part of the record. No questions are asked as to the description he files.

In many mining districts I understand there are provisions in the laws which allow of their amendment under certain conditions on due notice, but I do not understand the modifications could interfere with acquired rights.

Question. Suppose that all the miners in a district wish to change the size of their claims, would not it be competent (by a two-third vote) for them to come together and reach that result?—Answer. That is an extreme case, and I have never known such a case as that. I have known of laws being repealed, but never of their repeal being made retrospective. I cannot say it is within my knowledge that mining titles have been disturbed or eradicated through the fraudulent manipulation or destruction of mining records, though I have heard such things intimated. I do not think there is any security against such a practice, except the honor of the district recorder. The records are in his possession and he may manipulate them if he wants to. He is not under bonds nor under oath, and there is only the security of his personal integrity.

In answer to question 19, lode claims, witness stated that in his opinion the initiation of record title to claims could be advantageously placed in the hands of federal land officers as regards general results, but that it would likely work a hardship to individual miners, because a considerable interval must then necessarily elapse between the discovery of the claim and the recording of it. It would be necessary to have mineral discovered in a particular district, else there would be no federal officer present to make the record. It would be impossible to have a federal recorder in every mountain district of a mile or ten miles area, and in their absence prospectors would risk losing their claims, because they would have to notify the proper authorities that they had found mineral, and some one would have to be sent into the neighborhood to make a record of it, involving a delay often of weeks and months, when the man must be away from his claim hunting a federal recorder. As it is now, the districts are hardly ever larger than six miles square, and he need lose but little time in making his record—hardly ever more than a day—and hardly more than that interval elapses after the discovery of mineral before he seeks and obtains a record of his find. Among miners a record in a district office is much more generally respected than a notice posted on a claim. The fact that he has been to the district recorder's office and filed his claim for record is considered to give him a much better status than the mere posting of a notice. The result is that it would be a mere question of administration. Whether he filed with one man or another would not matter if he had the same facilities afforded him in either case, and it would be better for him to

file it with a United States officer than with an irresponsible recorder, if it could be done with the same speed; but no system should be adopted that would increase the delay or difficulty in securing a record of a mining claim.

As regards the inquiry whether requiring the record to be made with federal officers would not lead to greater benefit to the greater number by giving them more security for a proper record and in that way do away with litigation, I hardly believe in the greatest good to the greatest number; I believe in protecting the man who finds the mine, because without the discoverer we would not have mines at all. It is frequently stated that the professional prospectors do not derive benefit from their discoveries, but I have known a great many who have received a great many thousands of dollars for their rights of discovery. I think the present system loose and incomplete, and would prefer another if it could be arrived at without oppressing the class of people who find mines; but I would not advocate a system that would leave them without a record of location even for a short time. Miners very often go great distances from old districts, and it would be impossible to have a federal officer follow every group of two or three men wandering over the country in search of mineral. I think the system would be a judicious one generally, but I would not favor any system that would work oppressively to the prospecting classes.

There is no limit to the present system to which the record of location runs, as I understand it. At the present time a man may hold a mining claim for a lifetime under a notice of location. As regards the perpetuation of that system, I think it would be good with some modification—*i. e.*, that he hold the ground by a certain amount of work annually, and I would see to it that he actually did the work by a system of inspection by United States officers. The officer would not be required to be there until the district was populated to some extent, and he would not necessarily be in a certain locality all the time. What I mean is, that I would want it to be the fact that at least the claimants in a mining district actually did work, instead of representing that they did, and I would secure knowledge of the actual facts by some system of inspection. I would not leave it to the miner to say whether he had done the work, because in many instances claims are revived after they have been abandoned for years, for purposes of litigation. I do not think this theory of inspection would involve such a multiplicity of officers as to render it useless. It would not in this Territory. It would be a very easy matter to inspect the work of all the mines in Utah.

Q. Have you any idea of the number of locations in Utah?—A. I know what is said to be the number in Bingham.

Q. How many?—A. Five thousand five hundred. That represents about four square miles of territory.

Q. Now, extending that in similar proportion—— A. That is an exceptional case. You might go many miles where you would not find any location at all. Applying that to all the mineral districts in Utah, I think it would be practicable to obtain the requisite number of officers to make the inspections proposed. There should be an officer appointed for each one of the mineral districts. I do not know how many districts there are—probably 40 or 45 now. There were 37 in 1873.

Q. Then you would have in this one Territory 45 officers, to be paid for the mere inspection of mines developed. If that system were followed in each of the other States and Territories, would you not have a machinery that would render it impracticable?—A. I think not. I do not consider the question of expense should enter into this matter where the government is to pay for it. It is like the system of surveys; it is only impracticable because Congress will consider the matter of expense.

When I spoke of some modification in the present system of protecting prospectors' rights I had in mind an amendment to the mining laws, making known explicitly what the government requires in the matter of location, and not leaving it a matter of judicial construction; to make it perfectly plain to any man who engages in mining, and require him to strictly comply with it in making his locations, and have definite instructions published as to the manner of marking claims on the ground and as to the method of describing them, a neglect of which rules should work a forfeiture of his claim, which forfeiture should be determined by some officer appointed for the purpose. That duty might be imposed upon the mining inspectors.

Q. Suppose that officer decided that the location was not valid, inasmuch as the recorder is not a United States officer, what jurisdiction would the inspector have to take that record off his books?—A. It would not make any difference as long as the record was pronounced insufficient.

I am not elaborating a system for adoption, but am simply giving my idea of the best method of modifying the law. The act of 1872 requires that the location shall be so distinctly marked on the ground that its boundaries can be readily traced. No prospector knows what that means. Some construe it one way and some another. That is the fault of the law.

I am in favor of the repeal of the present mining laws and the substitution of another that would require the rectangular subdivision of the mineral lands of the country,

and I would have this rectangular subdivision to be of ten acres, in squares, and I would allow each prospector to locate from one to four of these squares, and I would have the plane of the side lines of this rectangular subdivision limit his right to the vein contained. The area of a mining claim made in one location of 40 acres would be 1,320 feet square. That, I think, would come as near doing away with litigation in connection with mining claims as anything I could think of. I repeat, I would allow a miner to take one to four of these locations, at his option, and for convenience in surveying I would make the locations in squares—not to include more than 40 acres of ground. The limit would be one-quarter the size of a quarter section of land, and the smallest quantity would be the smallest legal subdivision of land.

Such subdivisions as that above suggested would cut off the vein on the dip, the depth depending on the angle at which the vein dips. No two veins are alike. They run at different angles. If the apex of the vein was absolutely at one side of the location, and it went down at an angle of 45° from the horizontal, the depth on the dip would end at the square root of the sum of the squares of the two sides. Without figuring I cannot say exactly what it would be. Approximately, if the apex of the vein and one of the sides of this 40-acre tract coincided, and the dip is 45°, you can follow the dip of that vein 1,863 feet without going outside the tract, and under one location that would be the extent to which deep mining could be carried. If the vein pitched steeper you could of course go deeper, and if the pitch was not 45°, less. It is very seldom in this country that a vein has a less pitch than 30°. Presuming the apex to be at one side of the location, under the worst circumstances you would have 1,320 feet depth. I do not think such a restriction would give the death-blow to deep mining. The cases are so rare where any one goes down 1,800 feet on a vein that it is hardly worth naming. In this country, at least, it is very rare. The Comstock might be named as a noted exception. I am satisfied there is not a mine in Utah, Idaho, Montana, and Wyoming that is 1,800 feet in depth. I do not think that a system that would allow 1,800 feet and upwards on every vein, would interfere materially with the development of deep mining or defeat the investment of sufficient money to make it profitable in this country. If a mine is worked 1,000 or 1,200 feet its owners can form a very correct idea of what their vein is going to be for the next thousand feet, and then it would become their duty to purchase more land. They might make a second location to protect their dip. I am disposed to allow a man to have all the mining land he will work. I would give him more land to protect his work than under other circumstances. Even though you allow a man to make an immense location you cannot require him to do more work on it than he pleases. The chances are he will not utilize his own land and will not allow others to do it.

I consider mining at 1,800 feet tolerably deep mining, and I hardly think restricting a man to so much land as would allow him to go that deep would interfere with deep mining to such an extent as to retard its development or prevent the investment of capital in it.

As a matter of general policy I think that there should be a limitation as to the possessory title in mineral matters, so as to require them to perfect title within a reasonable time.

The law in relation to tunnel locations is a dead letter any way, and in the event of the adoption of my side-line suggestion it must necessarily be repealed. It might as well be repealed any way, for they have never struck any veins in the tunnels in this country. I do not know of the discovery of any such vein. I have heard rumors that such veins have been struck, but they have not been authenticated so far as I know. The only good tunnels do, they sometimes drain and assist in the working of mines. I do not know whether or not there have been any decisions by the courts in this Territory as to the rights of parties under tunnel locations.

In regard to mill-sites, I might say that mills are erected for several purposes; sometimes for the purpose of controlling the stream of water, and at other times for the purpose of putting mills up for the use of mines. Sometimes they are erected for the use of smelters or mills, and sometimes for speculation.

Within my knowledge the purposes intended by the law are not carried out in the location of mill-sites in any considerable number of instances. As regards the continuation of the mill-site privilege, I do not know that there is any real good, nor generally any great harm, in the law. If a man wants to put up a mill he can generally find a place to put it on without a mill-site. As I understand it, the law requires that land taken up as a mill-site shall be non-mineral and non-adjacent to the end of a mining claim. If not amended, the law should be enforced.

Testimony of L. S. Burnham, Bountiful, Utah.

L. S. BURNHAM, of Bountiful, Utah, testified at Salt Lake City, September 15, 1879, as follows:

The suggestions I have to make are simply on agriculture. There are many little evils we have to encounter here under the public-land system that are not known in other countries I have lived in.

I am a Mormon, but not a polygamist. I have for twenty-five years been acquainted with this community system. The system of disposal of our agricultural-land rights here has been entirely different from the one prescribed by United States laws, as I was familiar with them from having been twelve years in the business before I came here.

For many years we were not permitted to make any land claims except with the consent of the church. We could not take lands under the United States system up to the time the railroad got in here. The lawyers came in here, and a multitude of fraudulent claims have been the consequence, since the United States land office was established here. Everything broke loose then. The people could come in then and make filings according to law. Since the land office was opened, in 1869, an immense number of fraudulent filings have been made, and have led to an immense amount of litigation and mischief to the people. In more than one instance there has been a strong effort made to carry out some filing, especially on the part of the church.

Twenty-five years ago I wanted to take a piece of land here in Utah. I went and selected a piece and told the bishop that I wanted to go on to a piece of government land. He said, "I shall not allow you to go on to it." I said, "What is the matter?" and he replied, "You won't be permitted to touch it." They gave me no other reasons, only that. Then I tried another piece, but I met the same answer, until I learned that it was the ruling and custom here not to allow any person to take up a piece of land except by the bishop's sanction, and then it was advisable to take only from 10 to 20 acres.

Sometimes individuals who were favorites could go and take out other pieces of land; it depended on a man's standing in the church. When the land office was established a multitude of filings were proved in the end to be simply forms to prevent anybody going on to the land thus covered. A great part of them were homestead filings. The records of the office will show it. We found it necessary, in order to enter any kind of claims for homes for ourselves or pieces of ground, frequently to go outside of all that was called decent land. These old filings had become obsolete, for the parties never have been on them, making declarations in some way, and whenever there was an opportunity offered to take them we had to go through the forms of law or else hire them cancelled, although the time had expired. To hire them to send for the cancellation papers was the cheaper way. There was a multiplicity of fraudulent claims held over the whole country to keep the Gentiles from taking part of the land. We found that we could only accomplish that sometimes, for while waiting for return of cancellation papers from Washington to this office, which is the law, parties would come just in ahead of us and whip us out of it.

The first suggestion I had to make was that it seems as if the one who had obtained the cancellation of such old fraudulent claims was in possessory right, and ought to have a few days given him, if it is not more than two.

I think the local offices here should be permitted to manage the whole matter. The little humble farmer, who has only a few hundred dollars, and has to reach this thing inch by inch, it ruins him. I am on a desert-land filing. I had obtained the cancellation of a quarter section of land that was an old fraudulent filing. It cost me $35 to get that canceled. I sent it to Washington and it was returned. I had my attorney employed here, as I cannot be here all the time, to manage it for me. I had the money deposited at Walker's bank, subject to the orders of the attorney, but as soon as the papers came in, canceled, another party came in and gobbled it, and they probably got a letter from Washington about it.

If the officers here had the authority to make the cancellation, upon the proof that I had filed, I would have been protected. I would have saved my money, and obtained my land. The individual that heard of this filing and stepped in ahead of me made a desert filing and took it up, I think some years ago or more. He has made no use of the land at all; I have since been over there; he is a member of the Morman Church, but of course I cannot charge it to the Church.

I came here from Vermont because I believed in the principles of the Mormon church, and that it would make me a better man, but the practice and professions of the church do not agree; I am a Mormon but not a polygamist.

I have a wild suggestion to make, and it is this: In consideration of extreme difficulties and antagonisms, mostly by foreigners who now inhabit Utah, and the extreme prejudice on account of the teachings of the church against the economy of the government of the United States, in her method of disposing of the public lands, I would suggest that there be a commissioner over a certain number of land offices, who would bring up all land matters, and adjust and settle them, without the long

course of litigation that now exists in Utah. I have studied this matter for years and such a commission with appropriate legal authority would end a host of trouble for the poor farmers. The commissioner not to receive fees, but a salary; thus guarding him against anything like bribery. If it could have been so in years past it would have saved a terrible sight of feeling and prejudice which has been created against the government.

I am opposed to any pasturage system, and to the giving of 3,000 or any large number of acres to any one. My reasons are, that these dried-up and burnt lands are susceptible of becoming very valuable lands by boring artesion wells. I have tested it. I am at it now, and the result, as far as I have carried it (and it is only the beginning), has been a great deal more favorable than we expected. I am 9 miles north from Salt Lake City. I will give you my theory. As dry as it is—and it is the driest we have ever known it here—it has dried up millions of bushels of grain, still we bore down 10 feet with my little auger (which is my own invention) and we strike water. It is only a few miles from Salt Lake City, but we find it is not the seepage from the lake. We find that it is the gradual underflow from the mountains. It is fresh water; therefore it comes from the hills. It is fresh water and does not come from the lake. Salt Lake never seeps back. The water from the hills is forever crowding towards Salt Lake. In testing the matter we found this to be true. In boring 10 feet we struck water; in boring 50 feet we got enough water to run off a little stream. Forty-five feet would, perhaps, just make it stand level at the top. The formation we bore through is simply stratified clay; it is a mud deposit in the water. It is a stratified, regular formation, as if it had been deposited just so much each year, and as we pass through there is a little quicksand between two stratas, and in that quicksand there is a little water. Below that you reach another strata, and getting lower, you reach another. That is the theory we work on, and we find that it is the correct one. The theory appears proven as far as we have gone. We think we can get a flow after awhile. This will redeem these lands.

Another thing I wish to state: we have a worse enemy to encounter than the drought, and that is the terrible alkali beds. It takes science somewhat to master that. The alkali beds, so far as my knowledge and experience goes, cover almost all the desert lands in Utah. The waters contain a greater percentage of saline matter than they do on the other side of the range. Our waters carry from 7 to 10 per cent., and on the other side of the mountains they carry from 4 to 6 per cent. The alkali seems to be almost entirely on the top. It consists of all varieties of saline waters. There are more than fifty varieties of it. The fresh water, forever working towards the lake, becoming permeated through and through, is always carrying this saline matter, which is low down in the earth, right into Salt Lake. On the top it (the water) is never so strongly impregnated. When Salt Lake receded it left a great deal of saline matter near the surface. It impregnated the soil so strongly that we had years of trouble before we were able to raise cabbage; but when we do get it, it is the richest land in the world. The most effectual method of getting rid of it is the niter, which in rain and snow neutralizes it. It is better for it than anything we have ever tried. It seems to neutralize it without running off. Then we use the spring floods in the mountains. We wash it a a great deal that way. We wash the soil when the spring freshets result from the melting of the snow. That is one of the best ways we have of removing it from the soil. You see now why I am opposed to the pasturage homestead, for I think these lands can be utilized for agricultural purposes. The pasturage homestead law will have a tendency to monopoly. A man would take up a thousand acres of land in this way, and would be likely to let it lie idle for many years. If a man had 1,000 acres he would not do anything with it.

Under the present method we take five acres and subdue it, and next year we take another five acres. I could not take a thousand acres or a hundred acres and do anything with it. We farm about 91 acres of land. The church used to pester me, but they do not bother me now. I made an effort to take this land fifteen years ago, but they would not let me. President Brigham Young spent more than $200,000 of the church money redeeming that land, and it has failed since he died, and they abandoned it. We have not been allowed to file on it. They proposed to bring the water of the Jordan and Weber Rivers on to it, but they failed.

Another thing that I would suggest, that would do away with much of the difficulties surrounding the land question and bring the greatest amount of prosperity, is, that a commission be appointed to settle all these Mormon land titles. It would defeat every kind and character of foreign and domestic prejudice as to the economy of the system of the United States land laws.

Testimony of John Ward Christian, attorney-at-law, Beaver City, Utah.

BEAVER CITY, UTAH, *September* 22, 1879.

To the Public Land Commission:

GENTLEMEN: In answer to your interrogatories, I am unable to respond to all at once, but will now answer to your first ten general interrogatories, and will answer to those under the heads of agriculture, timber, lode claims, and placer claims hereafter, as my time will permit.

1. John Ward Christian; Beaver City, Utah; attorney-at-law.
2. Twenty-one years.
3. Have not.
4. Assisting various parties in procuring their land titles.
5. Homestead and pre-emption entries; usually from six to twelve months after making final proof. The expense depends usually upon the distance of the applicants and witnesses from the local land office. Places for making final proof should be increased and rendered more convenient to parties In contested cases, no definite time can be stated. In the case of Ashworth *vs.* Buckner (from this county), the contest lasted three or four years; the expense, including attorneys' fees, about $3,000 each. Since Ashworth draw out of the contest, Beaver City has taken up the matter of contesting Buckner's right to the same land and it is now pending in the land office. This land is worth about $2.50 per acre.
6. I have. One defect is in allowing more than one person to file a pre-emption entry upon the same tract. Another is in allowing parties to change from one entry to another; another is in allowing parties to abandon one entry or any number of entries, and make others. But one entry or filing should be allowed, and the party forever barred from making others, even if not perfected. This would limit contests and prevent speculative attempts.
7. In answer to this interrogatory, I will have to confine myself to this county (Beaver), owing to want of time and opportunity. The east boundary of this county is the summit of the Wasatch range of mountains. The west line is the east boundary of the State of Nevada. To the westward of the Wasatch it is a succession of small valleys (some fertile and some desert) and alternating hills and mountains, and high and barren table and bench lands, with but few streams and watering places other than the Beaver River and its three or four tributaries, to wit, North, Indian, and South Creeks, neither of which approach the Beaver during the latter summer months. The Beaver and tributaries all emerge from the western slope of the Wasatch—are flush during spring and early summer, owing to melting snows; but ordinarily during the irrigation season all of the waters of these streams are appropriated within a distance of 25 miles west from Beaver City and within 35 of their sources, the final appropriation of these waters being at the town of Minersville, 20 miles west of this place. The benches, foot-hills, and mountains west of Wasatch are, or have been to a great extent, covered with a species of scrubby cedar and piñon pine, fit only for fire-wood and for a character of fencing termed in the West "bull fence," built of stakes thrown across and riders thrown between, and vulgarly termed "rip-gut fence." These benches are very generally covered with "bunch-grass," except during dry seasons or seasons when the snowfall is light in the valleys and upon the benches west of Wasatch. The valleys near the streams are usually covered with a low underbrush called sage, rabbit, and grease brush, and in very damp places willow brush, with but little grass only upon low places where water overflows during the early part of spring seasons. All these valleys are in fact desert lands, or were twenty years ago, but when reclaimed by the application of water make good grain, hay, and pasture lands. The scarcity of the water is the great drawback, as the more valuable lands are not so situate as to admit of being irrigated.

The future of this county, and Southern Utah I may say, lies in its great mineral wealth, which is now being somewhat developed. The farm and garden products are not sufficient for the home consumption. As a pastoral district, our great trouble is lack of water at places where the best stock and sheep ranges or districts are. The great scarcity is during the summer and fall. After snowfall stock follow up the snow-line upon the mountains and subsist upon the snow.

The chief and in fact almost the only source for building and fencing timber is the Wasatch Mountains, which have heretofore afforded all that has been used, with but little exception. Its supply of saw timber is now very limited on the west side, yet there is plenty of small cabin and fencing timber, &c., but very difficult of approach.

8. As to the best method of disposing of the public lands now unappropriated in this county and in all other districts similarly situated, outside of those upon which cereals and hay can be grown, is to sell them to parties wishing to purchase, in such quantities as they may desire, at the government price, upon application direct to the Land Department. If they are not thus disposed of, the mining interests of Southern Utah will soon consume all of the scrubby cedar and pine forests for charcoal, which

is very extensively used in smelting ores; and these growths are, from my observation, not restored by new growths; otherwise these forests will become vast unmatured commons, and unsalable. A strict stumpage law—*i. e.*, so much per ton of coals—collectible from the consumers (the deliverers are too numerous to reach) might answer.

9. I know of no better system than the one adopted by the United States.

10. In those portions of the West situate as this and other Territories are, so far as my acquaintance goes, and especially this, Nevada, and Idaho Territories, and most of Arizona, where parties taking up farm lands have to procure their building and saw timber from the high mountains (their farms being low in the valleys), I would suggest that they be allowed to take, say, 100 acres in the valley and 80 up in the mountains among the timber, and thus parceling out the timber and thereby giving individuals power to protect it from merciless speculators in lumber, mining timbers, and railroad ties, and from fire, &c., thus throwing vast personal interests together, and thereby protect the general interest of the whole republic. Owing to a lack of some such arrangement, millions of feet of lumber have been cut and shipped from the western slope of the Wasacth in this county, during the last ten years, to Nevada and other places; and this mountain range is our only hope in future for all our mining and building materials, for supplying our mining and agricultural interest to its west—and west of this range are nearly all of our principal mining camps in Southern Utah.

Respectfully, &c.,

JNO. WARD CHRISTIAN.

Testimony of Daniel Davidson, sheep raiser, Salt Lake City, Utah.

DANIEL DAVIDSON, of Salt Lake City, testified, September 17, 1879, as follows:

I am a sheep raiser. My sheep ranche is on White River. I have about 29,000 sheep. I think five sheep will equal one beef. I think it would take 30 acres to graze five sheep. The country where I am is very mountainous. There has been plenty of water, but it is scarce now. I range over a space twenty miles long by four miles wide in the summer, and in the winter I go to another place, having about the same area. Two ranges are indispensable. In summer I drive up into the mountains, and in winter I drive down into the deserts. I do not own the land I range on because I cannot afford to pay the government price. It is unsurveyed land. I could materially increase the value of my flock if the land could be fenced in some way. The advantage would be I could move from place to place and keep others off. Then I could herd, and put in tame grasses, and make improvements generally. This land is not worth anything but for grazing purposes. I have great trouble to prevent people from causing their cattle to eat off the range. Sheep and cattle do not do well together, for the reason that the sheep nips the grass much closer to the ground than cattle do and eat the grass all off so that the cattle cannot get any. The idea that cattle will not graze on the same ground that sheep have grazed over is not true. I have seen in the east where sheep and cattle will do very well together if the pasturage is not overstocked. Where they are overstocked the sheep will take the grass all away from the cattle. Sheep will graze on the mountains where cattle will not. The ranges are steadily decreasing under this present system, but if I could own the land I could make the pasturage increase. I would then have an interest in making it increase. Last summer I went to work and fenced in a piece of grass. I should think about 230 acres. That is all the land I have fenced. I thought I was safe; that others would not come in; but other men came along and let down the bars and put their stock in my inclosure. They had just as much right to it as I had. If I owned the land I could then keep it up and improve it.

There is some conflict between the cattle and sheep men. The herds will run from 2,000 up to 16,000; mine is the largest herd. All the other herds in the Territory are about 8,000. They run in bands of about 2,500.

I think these lands should be sold. I think it would be to the advantage of the government and the people if they were sold. It would, I am sure, be better for all parties. I would sell them at a nominal price—at 10 cents per acre. There are thousands of acres that are not worth much for anything. The stock-water privileges are pretty well taken up. It (the water) is stocked about as well as it can be. I think I would sell the pasturage lands in unlimited quantities. I think the pasturage-homestead idea is a very good one. I think whatever is done should be done at once. It would be a great deal better for all parties concerned, better for the government and for the people. The government is getting no revenue from these lands, and the people are getting in all the time and getting the benefit of them. They take the timber off these lands and use it, and the government draws no revenue from them.

Sheep pay better than cattle. I have been in the business twenty-five years. Sheep will pay 60 per cent. I have made as high as 80 per cent. a year. Cattle will not pay more than 40 per cent. My shearing from 18,000 sheep nets $24,708. I raised from them 9,400 lambs. They are worth from $1.50 to $2 per head. The wool sells for 20

cents a pound. When I came here in 1871 they had the poorest sheep here I ever saw. They were the Mexican sheep. I went to Canada and bought some large English sheep and brought them here. Brigham Young sent one of his bishops down to see them (in 1872), and the next morning a letter came from his secretary for me to come to the office; and he said he had been down along with the bishop to look at my lambs; and he said, "They are going to be a great acquisition to this Territory." I told him that was what they wanted to improve the stock, and he said, "Don't you want to sell them?" I would not part with them to any man, but he insisted that I should sell them. I said that if I did I would have to go back to-morrow morning for more, and he told me to go on and get more from Canada; and he said, "I will sell the sheep for you." I went back the next morning to Canada, and I had not been there two days when a man by the name of Van Atten came there. I bought two car-loads; he bought three. I got a dispatch from my wife saying that none of the sheep were sold and that I had not better buy but one-half a car-load. I came home. They had not sold the sheep, and they never tried to; they did not want to. They thought it would cripple me by making me buy so many sheep. The man told me that he and Brigham Young were in partnership. They wanted to keep me out of the business. I breeded from them two years, and then sent to Ohio and bought merino sheep, and have been using them ever since. The sheep here all have the scab, and it is ten times as bad as in the States. I use tobacco and sulphur; ten parts of tobacco juice and five of sulphur. I use them every year, scab or no scab. You cannot sell scabby wool. I employ twelve herders and pay them $30 a month. It costs me $18 apiece to feed them.

This is not an agricultural country; it is a pastoral and mineral country. The only disease the sheep have here is scab. The alkali here cures the hoof-rot.

SALT LAKE CITY, *September* 11, 1879.

JOHN B. MILNER, of Provo, Utah County, Utah, made the following statement:

I am a farmer; I have been a farmer in Utah for twenty-five years. I live in Provo, Utah County, which is an agricultural county; I have lived there for twenty-five years. I own a tract of land, on which I live. I have myself personally attended to its cultivation, though I am now a practicing attorney. For several years I was county surveyor of that county. The corner posts having been lost, I had to resort to the records of the county survey, because the survey had been made some thirteen years and the stakes were mostly gone, having been of the softest white pine when put in, and in all but gravelly soil the mounds that were originally erected had by natural causes become level with the surface. I was not able to find in the entire county three stakes in place. Where the rock or gravel mounds were constructed I was usually able to find the mounds. These gravel or rock mounds were erected wherever the soil was gravelly. There were very few of them, only at the base of mountains. About one-eighth or one-tenth of the whole were gravelly mounds. The whole of Provo Valley was surveyed, being not more than twenty-five townships, and my observation was confined to these twenty-five townships. That is all there was in the county.

I am somewhat familiar with the requirements of the government surveys under the law. The monuments and stakes I found were not in accordance with the law at the time I found them. In only one instance was this the case, although I believe in most instances the stakes had been put down and the mounds erected. The soil of the arid land is impregnated with alkali, and the winter snows tend to make the land boggy, so that the stakes sink right down and disappear. I think rock monuments would be infinitely better. Rocks would not dissolve and rot as the gravel and stakes did. Alkali has the tendency to make them do so. I think the present system of rock monuments is the best. These rock monuments are now being planted regularly by the deputy surveyors. My present knowledge is somewhat limited, but there have been some resurveys made, and I have observed that the monuments have been planted in compliance with the law.

I do not concur in the general opinion that the original survey was a very bad one. It wasn't correct, it wasn't on the true meridian, nor did they use the true length of chain, but considering the circumstances I think it was a very fair survey. I am satisfied that the surveyors did not comply with the rules in correcting their chain at prescribed periods. And in not using the solar instrument they didn't get the true meridian to about 40 minutes. Utah County is not on the true meridian to about 40 minutes. The chain was too long. It not being on the true meridian at first, it was very difficult to replace it.

I think a correct survey can be made by using the solar instrument. Precise accuracy is not, of course, possible, but reasonable accuracy can be attained. The survey can be made within much less than the legal closing links. The legal closing links are, I think, 75 links to the mile. That is my recollection. The original survey was

in some cases scarcely within these limits. It can be done closer than that. I think generally that the rectangular system of surveying is not adapted to the surveys now to be made in this Territory, and in fact throughout the Rocky Mountains. All the valleys are mostly surveyed and the remaining unsurveyed land is now mostly in cañons or very small valleys. A rectangular survey through the cañons, chaining the exteriors of townships, is impractible and very expensive, and must necessarily be incorrect. It is impractible to carry such surveys through these mountains or valleys. I would triangulate them. There is much of this land that seems to be useless. It would seem to me that the system of authorizing irregular surveys would be well—that is, not on true lines—and possibly as to the quantity to be surveyed; the survey to be made at the expense of the parties desiring the land, and the paying of the expenses entitle the person to entry, and to be the only prerequisite to owning unsurveyed land. In compliance with other provisions of such a statute, if the survey was authorized to be irregular, it might meet the object both for mineral and also for those small irregular tracts of land for agricultural purposes in the cañons and other places.

I would take the liberty to suggest that a change in the land laws in relation to timber seems to be almost a necessity. Merely as a citizen I believe the government is under moral obligations, and possibly a legal one, to allow the citizens who have settled upon these lands in good faith to cut timber from the lands of the government for fencing and domestic purposes. There should be a law that would entitle them to do this. During the time that they are acquiring their title, there should be some method whereby those who have settled upon this land should have an opportunity to get their timber for domestic purposes in some manner. I do not mean for purposes of commerce. Possibly this timber land might be surveyed and communities permitted to enter a portion of the land on which the scraggy timber grows suitable for fencing and fuel. Perhaps it would be as well to permit the local legislature to enter this timber land in trust for and in behalf of the community, the legislature determining the method of disposing of the trust. If farmers were permitted to enter timber land for domestic purposes, that would tend to the benefit of the community. It would permit citizens to obtain timber without violating the law.

Question. Why limit your right of entry to communities?—Answer. I would not limit it to communities.

Q. Why provide for a community entry at all?—A. I would object to the timber lands being open to general entry, because it might create a monopoly. I would suggest this, too: That each and every owner of a mine should be permitted to enter so much timber land. Every person who has acquired title to a portion of government land for agricultural purposes ought to be permitted to enter a portion of timber land; and in each town and village some person should be permitted to enter in proportion to its inhabitants and in trust for them a certain amount of timber land, that they might get fuel and timber for fencing purposes for the use of the town.

Q. Why should that community be allowed to take the timber land?—A. It is impossible for a community to exist on land entirely barren of timber. My objection to private entry is that it would be embarrassing for the government. The difficulty is, that the amount of timber in this territory is very limited, and the lands as held by our people are held in very small quantities. If there was sufficient timber it might be well to open it to private entry, but I do not think there is enough timber to give every man in the Territory of Utah within 100 miles of the settlement 10 acres of timber; that is, every man that is the head of a family, and every man over the age of 21. My idea is, that as people live in communities and hold small tracts, say 5 or 10 acres, they should have a small amount of timber corresponding to their small tract of land, and the whole community will not want more than 160 acres. If agriculturists and miners were permitted to purchase at all, there would not be sufficient for them all, and it would be necessary in a few years to plant timber in the valleys. I am perfectly willing that it should be given to each individual citizen, and I should prefer this, if it can be done.

Q. What is the head of a family here?—A. The head of the family is the man; the different wives are not the heads of the family. It is possible that there are widows who are heads of families, and there are polygamous wives who are heads of families, but there are very few of them.

Q. What are the number of heads of families in the Territory?—A. I would estimate the number of heads of famllies at 15,000 or 20,000 in this Territory. In the community system of entries it would result in distributing the timber land among the population, even if a certain amount was given to each wife as the head of a family.

Q. Why would it not be a more satisfactory way to simply sell the timber land to whatever individuals wanted to buy it?—A. I think that in consequence of the fact that the timber is so limited in the vicinity of the improved lands of the Territory, it would create a great monopoly that would be detrimental to the actual settlers, as he might not get any of it; the settlers would then be at the mercy of the land grabbers. I think a man should be permitted to take the timber land in proportion to

the amount of agricultural land or mineral land he had, and the size of his family. My position is this, that if the government has sold me 160 acres of agricultural land I should be permitted to have a proportion of timber land with my 160 acres of agricultural land if I have acquired a lot in the city or town, and should be permitted to acquire timber in proportion to the area of the town property as a basis.

Q. Would it not create a monopoly by giving a man a tract of timber land for each of fifteen mines if he had so many?—A. I readily admit that the system I suggested may be abused and may tend in a degree to create a monopoly, but I think it is the least of the two evils. My suggestion is to distribute it to the actual settlers in proportion to the area of land they have; I think they ought to be entitled to a portion of the timber land to be entered in trust for them. All I want is to have the persons who are now on the land to have the timber for their wants only.

Q. What is your idea of the price for this timber land?—A. I have no opinion upon that question; if it was real timber land the price should be higher than agricultural land. There are large areas of land that possibly might not be called timber land that parties would be pleased to get title to where the scrubby cedars grow; it is valuable for mining purposes and for domestic uses, but no person could afford to pay much more than the price of agricultural land for it. The great difficulty is that you can seldom find a large body of timber together; it is in groves in the ravines, with large intervening spaces of bare barren rocks, with nothing whatever growing upon it, so that the majority of the timber land in Utah will not be worth more than agricultural land. Besides juniper, there is some pines (mountain pines), cottonwood, quaking aspens, and box-elder. We have no hard wood; one would hardly be worth more than another. I think a uniform price would be just; the price of agricultural land would be a good price for this timber land, for the land is worth nothing after the timber is cleared off. This timber sells generally at an average of $6 per cord. Much of this timber is brought a long distance; I have hauled timber ten miles. Where the timber grows you can get on an average $10 per acre.

Q. Do you know anything about the average cost of delivering it at market?—A. It will cost all it sells for. A person will only get the cost of his labor and hire of his team. If he had to hire his team to haul it with he would not make a cent. I know of no person in the Territory who makes it a regular business. Farmers engage in it at odd times.

Q. Is not in your opinion the destruction of the forests attributable more to fires than it is to the depredations of individuals?—A. Yes, sir. There has been more timber destroyed in my county by fires in the past month than the inhabitants would take out in a series of years; say four or five years.

Q. How are these fires started?—A. The fires generally originate through the carelessness of the persons hauling timber, through the lighting of camp-fires, or by hunters and Indians for the purpose of driving the game.

Q. Do you know of any legislation that could be enacted by which the starting of these fires could be prevented?—A. I do not. Ownership of a tract would to a very considerable extent. The creation of an interest would tend to its preservation.

Q. Could this subject of the destruction of timber be better taken care of if it was under the jurisdiction of the district land office?—A. Yes; I think it could.

Q. Can you state in a general way what the exact law is relating to water rights?—A. Practically there is none. It is usage; and the difficulty is, usage is not uniform; hence it does not become a custom. There are some general features that are common. The act of Congress providing that the prior claimants are entitled to the water is very generally recognized.

Q. What is your system of irrigating here?—A. The system of irrigating on a large scale is this: a number of persons will agree together that a certain tract of land is susceptible of irrigation from a certain stream; they will get an engineer to locate a canal from the main stream to this tract of land on the most feasible route; they will then come together, and under some mutual agreement construct a canal, and then will distribute the water under any arrangement that they may make, in proportion to the amount of labor that each man has done upon the canal, and will cultivate their land in proportion to the amount of water to which they are entitled. In a number of cases they are incorporated. In some cases the distribution of water is conducted by water-masters. In every case it is managed by committees elected by those men who build the canal. There is some man under their control who virtually distributes the water, and who determines the amount he shall distribute to each person. The whole matter is too much by common consent and not enough by rule. I have two cases that I have got to try next week, wherein I design to make it a point in the district court that a personal distribution of water by water-masters, even though he may under the statute be an officer, is not such a distribution as can be enforced. I do not know whether I will succeed in making that point or not.

There is another method of monopolizing the water, and that is by the municipal authorities. All the larger towns in the Territory are incorporated into cities by an act of the legislature, usually embracing very large areas often covering large tracts

of country. In these cases the city councils pass their ordinances creating the office of water-master, and these water-masters are usually appointed by the city council, and distributes the water to each and every farmer. In most all cases the ditches themselves have been constructed by the labor of individuals, by the labor of farmers, or by the labor of owners of town-lots, and the cities manage it. I think half the evils likely to grow out of it will be remedied by the action of the courts. I have a case now pending for a neighbor; I am attorney for him and he is suing for distribution of water. The difficulty is we do not know where we stand. I have myself expended $1,750 on one canal, and I think I own that canal, but I apprehend in a very short time that the city corporation will have litigation about it unless they allow me my $1,750 part of it.

Q. Who owns these ditches?—A. The city council claims jurisdiction, but I think it is my property.

Q. Where there is no municipal authority and no use of ditches how do people irrigate their land?—A. We have a statute which provides for such cases. It permits them to organize into irrigation districts. We have also a general incorporation law and some of them organize under the statutes which provide for the irrigation districts, and some incorporate under the general incorporation law.

Q. Suppose that two came out here alone; you go above on the river and I down below; is there any provision or custom or law regulating our use of that water?—A. There are two rules that the people are governed by. The law of priority as recorded by their own locations, and their customs which they themselves have adopted; and then to a great extent by the decisions of the supreme court of California. There have never been any decision of our supreme court. We only have the decision of our district court. We scarcely have any Territorial court law. We also follow the Supreme Court of the United States which reverses the common law. The California supreme court reversed it. The water law of the Pacific slope is court law to some extent regulated by act of Congress. The first man could take what he wanted and leave the rest. If he wanted he could take it all to the exclusion of the man below provided he used it in any useful way. That is, in mining, irrigation, and as a power for turning machinery with the intention of returning it to the stream. If the man below was the first man he could stop the man above from cutting off his supply. I do not know whether our Territorial legislature at its next session will pass an irrigation law or not. I believe they would if they could only be of the opinion that they could have time enough. The main point I wish to suggest on irrigation, or rather the reason why I noticed the subject, was this, that the land laws at the present time, both pre-emption and homestead, require residence.

Now if all our lands that are worth anything at all require to be irrigated, the expense of procuring water and making ditches is far greater than the expense of living upon the land. If an expenditure of, say, from $2 to $5 per acre for irrigation could be taken as settlement and parties were then permitted to "prove up" under it, it would be of great advantage. I have expended more for irrigation than would fence the land with good fences.

Testimony of E. S. Foote, ranchman, Salt Lake City, Utah.

E. S. FOOTE testified at Salt Lake City, September 11, 1879, as follows:

I am a ranchman in Richmond County, 18 miles from Evanston, Wyoming. I have been connected with cattle-raising for the last four or five years. We are very much at a loss to know what to do in the future on account of getting the title to our ranches. Under the present law we cannot enter enough land to make our ranch, and others can come in and cut us out. I am located on a small stream called Saleratus Creek.

It is necessary to have about 10 or 15 acres for each beef in order to keep them in fair order, and for sheep I should say five would equal one beef in that altitude, which is about 6,700 feet high. Agriculture is not possible there. It is not an agricultural district; it is too frosty. In order to make a success of stock-raising we have to cut hay for winter. To do that we have got to irrigate, and we cannot safely go to that expense unless we have some title to our lands better than we have now. Each year the grass deteriorates as the lands are pastured, especially if they are overstocked. It takes a greater acreage to keep a given quantity of stock. That is more especially so as regards sheep; it is caused mostly by overstocking. These wild grasses, if they are constantly cropped short and not allowed to go to seed, will run out very soon. I have lived in the Territory about 15 years, and that is my observation. I live southwest of here, and my county is becoming almost devoid of vegetation because the grasses have been eaten so closely. This could be avoided if we were allowed to own the land, and it would increase the quantity and quality of both. It would furthermore allow settlers to make improvements and introduce tame grasses, and improve their stock by

using fine bulls. Now it is but little of an object to undertake to improve stock because the neighbors get the benefit of the improvements one makes; but if we had some sort of ownership to the land, so as to fence it and be able to keep other people off, we could then care for that land. I would suggest that the land be sold in sufficient bodies at a nominal price; reduce it to the lowest price it has been in the market and subject it to a gradation act, say at 10 cents an acre.

I would place some limitation on the amount of land each person might get (say 1,000 acres to each man) to prevent whole counties being taken up by one individual. I would rather that the land should be sold in lots to a man who has herds in proportion to the number of his cattle. My idea is, that otherwise a man of moderate means would be crowded out of the country entirely, and I should make the number of cattle a man owned the unit of his acreage. I think a system that would allow the pasturage homestead of a sufficient size to support a family, and in addition to allow a man to purchase to the extent of the cattle he has, would be a very good plan.

The statute of this country allows three or more individuals to form an irrigation company and control the waters and distribute them; and the company then have the absolute use of those waters afterward, to the exclusion of any one else. Under that system the streams are all taken up without any ownership to the land other than the possessory title, so that in fact, under the existing statute, three or four people may take up and control all the water back of it, the limitation being that they must use the water, the evidence of use being affidavits. There is no limitation upon the right of a man to use the water so that it is possible for him to exhaust the whole of it to the exclusion of other parties.

I have both cattle and sheep, and I find the sheep drive the cattle off. They pasture the grasses so short that the cattle cannot graze, and then, too, they do not like the smell of the sheep. We keep them separated by herders. I lived in Tooele County, Utah, for some years. I think about 10,000 acres would support one beef in that county now. I have known, in the past, when it would support one beef to every 10 or 12 acres. It was then as good as my present range, and that result has been brought about by feeding it out. I was out in that quarter some months ago and I did not see any grass, except a few spears of meadow grass. Where I am now the land has been surveyed by the United States. We are within the railroad limits and have entered a section of desert land of 640 acres. We would buy the land if we could and make improvements.

A law concerning water was passed at the last session of the legislature. We have a sheep and cattle tax in our county, amounting to about 12 mills on the dollar. We cannot buy the railroad lands and I have been leasing them for 25 cents an acre, and sometimes, when a man has been irrigating his meadow all summer, it is lost to him in the winter by being taken by some other man, simply because the first one cannot own or control it. I would readily move away from these railroad lands to some other locality if it were possible to buy land.

The average size of cattle herds in our range is from 2,000 to 5,000, and our sheep herds are from 3,000 to 15,000. There are constant conflicts between sheep and cattle men, and I think this question of disposing of the lands should be settled. Some cities have ordinances preventing sheep coming within a certain distance of them. If I was located with a herd of cattle a man might come in there with a band of sheep and drive me away from my home. A man holding the water right here and controlling all the land should be allowed to buy it, and ought to be made to.

Testimony of Samuel Gilson, horse and cattle raiser, Salt Lake City, Utah.

SAMUEL GILSON.

Is engaged in raising horses and cattle, and has a ranch in Castle Valley, in Central Utah. He states that the pastoral interests of Utah labor under great difficulties from the fact that no person who pastures cattle upon a range can be secure in his occupancy. Any other owner of cattle may at any time bring a herd to pasture upon the same range, and overstock it so that the grass is rapidly eaten and then both herds are obliged to emigrate to other localities. This is not only common in Utah, but is an universal rule. Very few herds can occupy any range for a long period, because as soon as it is known that good grass is found there herds from other ranges which have been eaten out are driven upon it, crowding it beyond its capacity. The newly arrived herds have themselves been driven away by the same causes from their previous ranges, or perhaps have been displaced by sheep herds, which will quickly drive off cattle from any range. There is no local law or custom by which a cattle raiser can be protected in his occupancy, and he believes that some way ought to be provided by which such occupancy can be secured. Under the present state of affairs

there is no permanency of residence, and no identification of any pastoral interests with the soil; nor is there any encouragement to make permanent improvements, nor any improvements beyond those which are absolutely necessary for the most temporary purposes.

If some way could be provided by which ownership of a range or a tenure could be secured by law to the occupant it would in Utah be of great benefit to the cattle interest. There are ranges which are utterly unfit for ordinary agricultural purposes and suited only for stock-raising. If a person could locate in one of these places, and be secure in his holding, he could raise grass very cheaply by irrigation, and sustain his herd through the winter on a comparatively small tract of land. I mean small when compared with the wide areas over which they must now range in order to get enough grass to sustain life. There is a general conviction among cattle-growers of Utah that the industry must come to the raising of tame grasses for the winter feeding of cattle, or else the whole industry will die out altogether. The wild grasses—the bunch-grass once so abundant everywhere—are soon killed off by protracted feeding, and do not grow again unless after long years, when in the slow course of nature they come up again from seed. Most of this wild grass has been destroyed already, and ranges which once were thick and deep with it are now utterly barren of it, and if left to nature many years,-perhaps generations, must pass before it would be restored. Tame grasses would not be killed so readily, for they form a turf, and would yield hay in large quantities by irrigation.

The Frémont or Dirty Devil River will never be used for irrigation successfully. It runs through Rabbit Valley, where a very large area can be devoted to the raising of grass, and is fit for nothing else. When the river leaves that valley it flows through a country where agriculture is impossible under any circumstances, and finally reaches the Colorado through deep, narrow cañons. If a stock grower could take up a suitable tract in that valley and be protected in his ownership he could raise a large herd on a comparatively small tract. Most of the good ranges, except in the high plateaus, have been eaten out, and are now nothing but barren desert, and these have once been covered with a rank growth of wild grass. Through the gradual extinction of the grass the pasturage has grown poorer and poorer, and in a very few years the amount of stock raised in this Territory will be merely nominal, unless some way can be provided by which human industry can supply the defect. All stock growers would agree with me, I think, that cattle-raising could be prosecuted profitably by raising tame grass by irrigation. But in order to do this it will be necessary to provide the means of allowing settlers to take up large tracts—I mean more than 160 acres, and probably as much as ten times that amount—and give them exclusive possession of it.

In answer to the inquiry whether the use of water for irrigating grass would not take away just so much water from streams which are used for irrigating grain crops, I say no. The tame grasses ripen here in June or July, and would not require any irrigation after May or the early part of June. At that time the streams are at flood, and carry a very large excess of water. The grain crops require their principal irrigation in the latter part of July and August, when the streams have fallen off to less than half their volume at flood-time. The irrigating capacity of a stream for grain crops is the quantity of water it carries in the latter part of July and in August. The irrigating capacity for grass would be the quantity which it would carry in May and June. In those months the streams could spare for a grass crop two or three times as much water as would be called for by the largest possible grain crops, without the slightest injury to agriculture.

The methods of managing herds of cattle in Utah are widely different from those employed in Colorado. We usually take, whenever we can, a winter and a summer range. The winter ranges are in the valleys and lower levels generally. The summer ranges are high up in the mountains or high plateaus. The snowfall is always light in the valleys of the desert portions of Utah, and quickly melts. We have no storms of extremely cold wind, before which cattle must drift in order to keep from freezing, and in the severest winter winds they easily find shelter behind cliffs or in gulches or in cedar groves. They are never driven off the range by storms and very rarely perish on account of the weather, unless they are starved and gaunt. There is no general "round-up," but we keep the cattle from straying very far, and send out for them at all times; in other words, keep them rounded up at all times. We corral them in the spring or early summer for branding, and brand at various times through the summer, whenever convenient. The summer ranges in the higher levels are abandoned by the cattle when the snows come, and the cattle always come down in long trains, without being driven, and enter the valleys when the snow gets deep above. There they are easily caught and herded.

I think the wants of the stock industry would be met if the lands suitable for pasturage could be obtained from the government, either by pre-emption or by purchase, in tracts large enough to support a moderate herd. I think it would be unwise and even wrong to allow a few men to obtain land monopolies from the government. A policy which fixed no limit to the amount of land which an individual could acquire

would be very repugnant to the people with whom I am acquainted. But a reasonable tract, sufficient for the support of a moderate herd, or even of a small one, should, in my opinion, be placed within the reach of any man who chooses to acquire one. I think it would be better for him to buy it rather than to acquire it for nothing. Under the homestead law there is apt to be much perjury and dishonest acquisition of land, and I think the pre-emption of such tracts would be preferable.

Testimony of James H. Martineau, deputy United States mineral surveyor, Cache County, Utah.

The questions to which the following answers are given will be found on sheet facing page 1.

The honorable Public Land Commission:

GENTLEMEN: In reply to the questions in the circular forwarded to me, I have the honor to make the following report, numbering each answer to correspond with that of each interrogatory.

For more than thirty years I have been a resident of this mountain region, in Utah, Nevada, Wyoming, and Idaho, and have personal knowledge upon many of the subjects referred to; but in regard to some of them I have not, and such will leave unanswered. The past thirty years have been spent in surveying, civil engineering, exploring, and Indian warfare, which experiences have given me a very complete knowledge of the physical character of the country. In the hope that my communication may be of some use to the Commission, I remain,

Very respectfully,

JAMES H. MARTINEAU,
Deputy United States Mineral Surveyor.

ANSWERS.

1. James Henry Martineau; Logan, Cache County, Utah; surveyor, civil engineer, and deputy United States mineral surveyor.

2. In Cache County nineteen years; in the Territories about thirty years.

3. I have not, except to locate in Wisconsin a land warrant received from the United States for service in the Mexican war.

4. Have seen the settlement of these Territories, and know the experience of very many acquaintances.

5. From one to seven years in pre-emptions; in homesteads, after the five years expires, from one to three years. This applies to *uncontested* cases; contested cases are longer.

6. Have noted some. There are lands very desirable to enter upon which settlers *cannot* reside as prescribed by law, being compelled thereby to make false statements to the land officers; such, for instance, as low, wet, swampy lands, upon which no one can live, but desirable and necessary for hay and pasturage. Also lands unsafe on account of Indians and possible danger to life. To remedy this I suggest, in case of wet lands, that parties may "prove up" their claim by making proof satisfactory to the local land officers, in connection with the "field-notes" of the United States surveys of the character of the tract in question, that said land is unfit for residence. In case of lands unsafe on account of Indians, proof from the county court or from other reliable authority should be presented as to the facts in the case; the time so *unavoidably* spent away from the homestead to be credited to the applicant. When possible, settlers should reside on the land claimed.

7. The public lands still unsettled are agricultural, pastoral, mineral, and timbered.

8. 1st. By the field-notes of the land already surveyed. 2d. Lands unsurveyed. Lands adapted to agriculture to be surveyed under the present system. Mountains and broken, hilly land not adapted to cultivation should be ascertained as such by running standard parallels and meridians at certain distances apart; from said standards and meridians township lines to be run in cases where an inspection of the country would indicate land suitable for subdivision. Mountains or broken land not worthy of subdivision to be surveyed by triangulation. Mineral and valuable timber land to be located and subdivided according to the conformation of the country by cañons, ridges, and basins.

9. Having ascertained by standard parallels and meridians, and sometimes by lines running on township boundaries, the character of the tract in question, I would survey agricultural land suitable for settlement by the present system; timber land and pastoral to be parceled according to natural conformation by cañons, ridges, &c. In

this region timber always grows, if any at all, on the northern or shady slopes of ridges and mountains; never, scarcely, on the sunny or southern slopes. Roads are only possible along bottoms of cañons, winding in every direction; and to obtain the timber it must be slidden down the rough, steep, rocky mountain paths with infinite toil. If these precipitous and deeply-seamed mountain sides were subdivided into sections as other land, the greater part would not be worth entry, because there would be no way to get to them without crossing some one else's claim. I would suggest that the long, narrow strips of timber along the side of the cañon could be subdivided for sale best by running straight lines from the bottom of the cañon to the top of the ridge, dividing it into strips of from 40 to 160 acres. For platting and numbering a line should be surveyed in the bottom of the cañon, connected with some United States survey corner or monument. Pastoral lands on the sunny side of mountain ridges may be laid out in a similar manner; in other places, according to the natural basins and drainage of the country. Mineral lands to be surveyed substantially as at present, providing that United States mineral monuments may be properly connected by triangulation with United States surveys or noted objects. The present system of disposing of public land is good, so far as relates to land capable of producing crops without irrigation; but for lands that *cannot* be cultivated without irrigation, justice to the hardy pioneer should *give* him the land he redeems from desert sterility, the settler merely paying the expense of survey and fees for making the necessary entries in the land office. If this be deemed inexpedient, let the prices of public lands be graded. Lands suitable only for stock range not to exceed 25 cents per acre; arable land needing irrigation not exceeding 50 cents per acre; timber land to be graded according to kind and amount of timber at from 25 cents to $2 50 per acre.

AGRICULTURE.

1. Climate is mild in Utah and Nevada; rainfall light. Season for growing crops about as in New York State. Snow rarely more than 6 or 8 inches deep in the valleys; in the mountains 2 to 25 feet deep. Water for irrigation comes from small mountain streams fed by snows of winter.

2. The rainfall is usually from October to April, with a few light showers during the rest of the year. Scarcely any rain falls in irrigation season, which is from May to September. We depend entirely upon irrigation.

3. Not more than 1 per cent. of the arable land.

4. Of the whole Territory, I think about 15 per cent. by natural streams; by artesian wells, about 5 per cent. additional.

5. Wheat, oats, barley, rye, corn, lucerne, clover, grass, potatoes, and all varieties of root crops growing in the Northern and Middle States.

6. Difficult to say. Some land—loamy—will do with two irrigations; a loose, gravelly subsoil necessitates as many as ten.

7. Small mountain streams and brooks. In some cases the waters of the larger rivers, as Bear, Weber, Logan, and Sevier.

8. I have an extensive practical knowledge of irrigation, but cannot say much in this report. Grain *must* have water when the kernel is in the dough, or it will shrivel in ripening. Potatoes *must* have water when in blossom, and when the tubers begin to form. So with other crops. Irrigation greatly increases the fertility of the soil, especially when the water is muddy; or even if clear, when not applied too long at a time in one place. Crops have been grown at an altitude of 7,000 feet, and some kinds will probably mature still higher.

9. Ninety-five per cent. in some localities. When water is scarce, it is all used. The water returned to ditches is only that which escapes control. Waste of water is rigidly guarded against. A man is entitled to water in proportion to the number of acres to be watered—in many localities, from one to two hours to the acre in daytime; double that during the night. The main canals and their numerous branches are each placed in charge of a water-master, who gives the stream to each in his turn; and who also has charge of repairs, &c.

10. In the settled portions it is all taken up. The local customs and laws are as follows: Settlers in a new place take as much water as they need in a canal. If there be water still unclaimed in the stream other parties may take it. No one can water to the detriment of first parties claiming and using it. Water rights are bought and sold as other property. Selling land is also a sale of the water right of said land unless expressly stipulated to the contrary.

11. But two have come before the United States district courts. They were the cases of men who endeavored to take the water from previous owners by new canals; but the decision of the court was against them, confirming the rights of previous owners.

12. Twenty-five per cent.

13. It is. Two to three thousand acres.

14. They should only be sold to actual settlers.

15. Six acres. This is about the average for pasturage.

16. One hundred is the least number on good range; four times as many on the usual quality of grazing.
17. Do not know.
18. Diminished rapidly.
19. No; cattle cannot be confined by fences on the range. It would greatly. Men raising improved stock would not then be troubled by inferior stock getting into their herds.
20. Springs and mountain streams.
22. Five.
23. Diminished. Sheep kill out the grass in three or four years.
24. No. Cattle and horses will not graze after sheep unless compelled.
25. None that I know of.
26. Do not know. Sheep are from 1,000 to 8,000 in a herd; cattle, 1,500 to 5,000.
27. Run standards and meridians a few miles apart to learn the physical nature of the country from which subsidiary lines, township or otherwise, may be run to such portions as need subdivision or parceling. Sell first-class agricultural land at $1.25 per acre to actual settlers; lands requiring irrigation at not more than 50 cents per acre; pastoral lands, 2,500 acres to each settler at 25 cents per acre; timber lands to be classified and sold at from 50 cents to $2.50 per acre to actual residents.
28. There is. The first United States surveys made over twenty years ago, especially under Mr. Burr, were mostly made upon *paper* only. Of the corners actually set many were destroyed by prairie fires long before settlement; many by jealous Indians and some by thoughtless whites, herdsmen, and others. It would be a great blessing if the government would authorize a *resurvey* in some localities, even if it should be at the expense of the county or Territory interested.

TIMBER.

1. It is scarce; red pine on the lower ridges; white pine and aspen (the latter worthless) on the higher; very difficult of access, and requiring from two to four days for a man to make one round trip.
2. Very little planted, there being no ground or water for it. The pine will not grow in low altitudes.
3. By sale, parceling the timber land in strips running from the bottom of the cañon to the top of the timber-covered side of the mountains, usually from 40 to 100 chains, the base line in the bottom of the cañon to be carefully run, connecting with some point of the regular United States survey. These strips to be from twenty to forty chains wide.

I prefer *sale* of timber, because it is the only effectual way to preserve it. A man will naturally look after his own property, but be wasteful when it is not. If timber land be leased an army of inspectors will be necessary, or a failure to preserve the timber will result. Men leasing timber should be required to keep up the growth of timber by planting small trees, and protecting small timber naturally growing thereon. But few men could be found who would carefully supervise this, and without such constant supervision the scheme would be a failure. But men *owning* the timber, and knowing they could never make another entry, would preserve it.

The local land offices could best see to these matters, being nearest the ground and familiar with the country, people, circumstances, and necessities of the case. They could appoint overseers for each county, and cause all land parceled out to be returned to the surveyor-general's office as other surveys. Railroads should be prohibited from purchase. They, more than all other causes combined, destroy timber, using generally small timber suitable for single ties, while settlers cut the full-grown trees.

4. Yes.
5. There is. The same kind of timber springs up from seeds, but is of slow growth.
6. Forest fires are generally accidental, originating sometimes by lightning, often by smoldering embers of deserted camp-fires, scattered by gusts of wind among surrounding leaves and twigs. Hundreds of square miles of timber have been burned this year in Utah alone. In Utah a Territorial law imposes a fine of $1,000 for setting fire on the public domain, but it is almost impossible to ascertain the perpetrator of the act. If men *owned* the timber land it would be watched by persons directly interested. The settlers *must* have timber for building, mining, and manufacturing purposes. The country cannot be inhabited without. To absolutely prevent timber from being used would cause a region of wonderful mineral and agricultural wealth to revert to desolation. Men can no more be prevented from using the timber than from drinking the water of the mountain stream.
8. Local custom requires men who cut timber to remove it in a reasonable time, or any other person may take it.
9. Yes. They know better than any one else can the conditions, requirements, and circumstances pertaining to their respective districts of country, and from personal acquaintance of their deputies and others most liable to understand.

LODE CLAIMS.

1. Some experience in surveying claims; none as an attorney.
2. A great defect, I think, is allowing one claim to overlap another when surveyed for patent. There are many cases of from three to seven conflicts in regard to superficial area of ground, and litigation, expensive and vexatious, renders many *good* mines practically worthless.
3. It is very unjust to the original and rightful owners of the claim and very injurious to the prosperity of the country at large. Out of many cases, instance the "Shoo Fly" in the Ophir Mining District, Tooele County, Utah, which overlaps four other and previous claims; and some of the four also overlap each other. The "Mono" overlaps the "Shoo Fly," and the "Utah Queen" both the former. Also, in the same case, the "I X L" overlaps the "Grecian Bend," which covers part of the "Mono," which also overlaps the "Shoo Fly." I should infer, if government intends to protect and give title to the original locator, it should only allow a claimant for a particular location upon conclusive evidence that such location was actually the first; afterwards no party should be allowed to claim ground previously filed on in the United States land offices.
4. The outcrop of a vein or lode. I think not. Slides of earth or rock frequently occur, covering what was formerly the outcrop of a vein or lode.
5. Not always.
6. Frequently.
7. Not personally; have often heard of such difficulties.
8. Cannot say positively.
9. I think not.
10. They may, but not in my personal experience.
11. To their disadvantage. Parties make such claims sometimes for the purpose of contest and to force other parties to buy them off by compromise.
12. Have no experience of such a case.
13. I think so.
14. Possibly.
15. Yes. In Logan, Cache County, by about twenty parties, some miners, others citizens, but all interested in claims. A recorder was elected, with power to appoint a deputy. His duty was to make record of locations, make and record minutes of mining-district meetings, together with the mining-district laws (all such records being open to inspection by interested parties during business hours). The main object is to keep a true record of claims, showing direction, length, and width claimed, time of location, &c. The discoverer posts a notice on the ground, giving names of locators, general direction of claim, and number of feet claimed, and width. They claim the vein or lode, with all its angles, dips, branches, and variations, the specified number of feet as to length, and, between end lines, to follow the vein downward wherever it goes, to the center of the earth. The effect of such a notice, recorded within the specified time, is to give them absolute possession.
18. They have not, I think.
19. I think not in many cases. Prospectors open claims in places many days' journey from United States land offices, and often, if they were compelled to make such a journey, their claims would be taken by rascals while they were gone. A local mining district obviates this danger.
20. I think it should.
21. Am incompetent to suggest anything in so important a matter.
22. I think so. Five years.

PLACER CLAIMS.

1. About one-half. The minerals are specular, bog, and hematite iron, silver, copper, lead, antimony, coal, and black, white, and variegated marble. Also sulphur, copperas, alum, manganese, tellurium, cinnabar, and mineral wax (so-called).
2. Never acted as attorney in such matters, and am not prepared to answer.
3. Same answer as No. 2.
4, 5, and 6. Same answer.
7. Have never heard of such a thing being done.
8. Not to my knowledge.
9. I do not.

Respectfully submitted,

JAMES H. MARTINEAU,
United States Mineral Surveyor.

NOTE.—I have been absent for several weeks in Idaho, which will explain why I have not answered the circular sooner.

Respectfully,

J. H. MARTINEAU.

LOGAN, *November* 1, 1879.

Testimony of H. P. Mason, engaged in the timber and lumber business, Salt Lake City, Utah.

H. P. MASON, who is engaged in the timber and lumber business, testified at Salt Lake City, September 15, 1879, as follows:

We purchase lumber cut here in Utah on the government lands. I think that the timber lands should be protected in some way. The timbermen are willing to satisfy the government. As I understand the law the timber can be confiscated if it is cut from government land. I have had some talk with the lumbermen, and they appear to think that they should be permitted to buy the land or pay stumpage on it. If they can satisfy the government in any way they would be willing to do so. They don't wish to be annoyed in their business. I think the whole subject might be better managed if placed under the control of the district land office. I think the land ought to be sold. There is not one mill here that can control much forest. They cannot go more than two or three miles; it does not pay. The timber is high on the mountains, and is hard to get at. But it would be necessary to sell the lands very cheaply, because the men have to buy so much land to get the necessary amount of timber. I think it should be sold in unlimited quantities for that reason. A large amount of timber is destroyed here by fires, and all the timber will go in a few years if it is not protected. I think it is better to give the inhabitants a chance than to let fire destroy it. The people are bound to get it, and if there is no law permitting them they will take the chances on it. The demand is great, and they will have it and supply it in any case. There is very little timber here. The best timber comes from the East and poor timber from the West. There is not enough to supply the local demands, but I think that what is here should be protected. I think it would be better for the government to get something for it than to have it destroyed by fire. Ownership would tend to protect it. The people do not feel safe in doing anything because of the unsettled condition of affairs. I suppose there are 500 men in the timber business in the Territory of Utah, and they are only getting a living at it. They are willing to obey the law if the government makes it possible for them to do so.

Testimony of William R. May, cattle raiser, Nephi, Utah.

Mr. WILLIAM R. MAY, of Nephi, Juab County, Utah:

Has resided here since 1860; is engaged in raising cattle and to some extent in farming; has been assessor and collector, and also has practiced law; is a member of the Mormon Church.

On the subject of occupying and irrigating land he states that the Mormon people have been in the habit of proceeding in detachments consisting of a number of families, sometimes as great as thirty or forty, but usually less, to some stream which could be used for watering farms. They at once divided up the land in their own way, being governed by the capacity of the stream and any local considerations incident to the place. The land was subdivided into tracts of from 10 to 20 acres, necessarily contiguous, and in as compact a body as possible, partly for convenience in irrigation, partly for defense against Indians. The first labor was given to building a defensive work against attack and in providing shelter that is—houses of preliminary and very primitive construction. The next work was the irrigating ditch, or, indeed, the ditch progressed often from the start along with defensive operations. It was dug by the co-operation of all the colony, each man being expected and required to give to its construction an amount of work proportional to the acreage of his land. There was no act of incorporation of ownership in the ditch at first, it being regarded as the common property of the community.

The titles to land were acquired in the following manner: After the original subdivision was made into ten and twenty acre lots, the land was held practically for about ten years, or even fifteen years, under squatter rights. As nobody but Mormons lived here then such tenure was as good as by patent. About ten years ago the laws of preemption and homestead were extended over the Territory, and it was considered of importance to then acquire government titles. Some of the land was then taken up by pre-emption, some by homestead. At the same time some of the land was also taken up as township sites, but this method was not extensively followed. To take up a township site it would be necessary to have officials and a civil government organization, and this was thought to be an unnecessary expense and money was exceedingly scarce. All the temporal as well as ecclesiastical affairs of the people were regulated by the church, and the double government was thought superfluous, so the township-site locations gradually fell into disuse and homestead and pre-emption were chiefly resorted to.

When the township method was employed the settlements were incorporated as cities under Territorial law, and a regular *suite* of officers, mayor and aldermen, &c.,

were appointed, but none received salaries. The entries of township sites at the land office were made in conformity with law by the mayor of an incorporated city, or by a probate judge of a county in behalf of other settlements, and the payments were made by these officials for their people, and when the patents were received the deeds of the several parcels of land were made by the judge or mayor to the respective occupants. Such farm lands as were required in tracts lying outside the township site were homesteaded or pre-empted by persons in 160-acre tracts, and titles to the subdivisions of these quarter sections were deeded by them to the several occupants.

There is, however, in nearly every settlement a small portion of the land which has been taken up as township site, and this was rendered necessary by the very compact manner in which people were compelled to cluster together for defense against Indians and for irrigating from a common ditch dug without capital. By far the greater portion, however, has been homesteaded or pre-empted.

In the distribution of water rights each man was allotted his share in proportion to his acreage, provided he had done a corresponding amount of work upon the ditch. The capacity of the stream had been carefully estimated, and no more water was assigned to the land than it was believed to be able to irrigate. In the year 1870 it had become manifest that the quantity of water in the streams had notably increased, and more fields were assigned to incoming settlers and a supply of water furnished to them. This was done by common consent, and the water was distributed under the supervision of the town water-masters. The rights of the earlier occupants to water are, however, undoubtedly prior rights under the law, but there has never been occasion to insist upon this priority to the deprivation of later occupants, because the supply, though strictly limited, has in general been sufficient to meet the principal wants. The advice of the church is always followed in the distribution and regulation of water.

Testimony of J. B. Neil, register of the land office at Salt Lake, Utah.

J. B. NEIL, register of the land office at Salt Lake, Utah, testified as follows:

I think that all the forms in homestead and pre-emption entries could be much simplified. The notice of intention to prove up in homestead and pre-emption cases is altogether unnecessary and is very provocative of contests. In canceling an abandonment of a homestead we take the proof here and send it to Washington. We make a report to the effect that such cancellation proof has been taken, and then wait until the department at Washington sends back to us an order for the cancellation of the land. We cannot cancel the entry until the order comes from Washington. I think that the cancellation of homesteads abandoned should be made at the land office where the proof is taken. It is done upon our recommendation anyhow, and the interests of the public would be subserved if we were permitted to declare the abandonment. It takes six months for the order of relinquishment to come from Washington here. It would be better to do it right in the local office, to the saving of the time consumed in forwarding the case to Washington and getting it back. The rule is now that the person in possession of the land cannot file until the abandonment is declared, and the local land officers are not allowed to communicate to him in advance; and thus it frequently happens by reason of the rule, and because we have no right to notify any one, that other persons than those equitably entitled to the land rush in and file and get it. I think that the same rule should apply as in contested cases; *i. e.*, we should be allowed to send notices.

I do not see any reason why the inception of mineral titles should not be just the same as in the pre-emption or homesteading of agricultural lands; and the whole system of district recorders should, I think, be abolished, as a man's title to a valuable piece of property now rests upon a recorder's integrity and upon his keeping the records correct; and it is certain that they are frequently kept by incompetent and probably illiterate men and subjected to all the inconveniences of a mining camp, especially in a new district. I think the registers and receivers of the land districts should have exclusive charge of and jurisdiction over the timber, and if the present law was amended to do that, it would be of great advantage to the government and to the people.

I think that under certain limitations a sale of all the lands adapted to pasturage would be advantageous to the stock raisers of the country, but I have not thought of any system of disposing of them; but certainly in any modification of the present law the interests of owners of existing herds of cattle should be protected.

I think the water rights in this district are well taken up. The general estimate of agricultural lands in this State is about 50 per cent. These agricultural lands consist of desert and pasturage lands. I think there is very little irrigable land that has not been taken up; I mean lands available without vast expense in the building of ditches, &c.

Since I have been here, a little over two years, both seasons have been exceedingly dry ones. From what I can learn agriculture does not pay well here, and would only be profitable on a large scale. The resources of Utah are mineral and stock raising. I think the greater part of the land classed as agricultural is really only pasturage land.

I have had no complaint of conflicts between the sheep and cattle men. The people in filing on their land complain to some extent that the stakes are gone, and they hire surveyors to find their corners for them. The stakes are not permanent in the first place, and time destroys them; they rot off or are broken down and destroyed. I think it very advisable and necessary that some permanent form of stake be used. There was one case in this office of complaint where land was marked as mineral when it was agricultural. I know of no way under the present system by which a more correct classification could be made. I think there could and should be an improvement in the classification, but just how it should be doue I would not like to undertake to say, for I have not given it sufficient thought. In the interests of this Territory, I think the whole matter ought to be settled promptly. I think there is a great deal of red tape that might be done away with, and that registers and receivers should have more jurisdiction, and that they should have a right to subpœna witnesses and perpetuate testimony. In regard to improvement in administration, I think it is not the fault of a law but of the land office. Now, for instance, in regard to the difficulty of obtaining patents, take the case of a cash entry which involves much delay in the general office. Probably there are a great many deficiencies in the preparation of the case, particulars that are lacking, and the clerk at Washington will go over that case, and he will discover these deficiencies, that something is needed to complete the case. He sits down and writes a letter calling for three or four supplementary proofs, and afterward he finds other deficiencies and writes another letter, and all this causes a delay of not less than six months, where it is not necessary at all. In the homestead and mineral divisions they are more practical. I think in a great many instances that the register and receiver should have final jurisdiction.

The office regulations and the law conflict in the matter of contracting for canceling the land before the pre-emption is made. This compels men to commit perjury. Inasmuch as the pre-emption law has a homestead feature in it I do not see any harm in repealing the pre-emption act. I am in favor of selling the timber land, not under the present law, but let the purchaser take them where he likes. I do not just know what to put the limit at, but I would sell them at a price not to exceed fifty cents per acre. Destructive timber fires could be stopped in a great measure by selling these lands; self-interest will protect them and self-interest will protect the growing timber. The present law does not protect it in any respect, not even in the collection of stumpage. There are a few timber-culture entries here, about thirty-eight in all. My objection to the present timber-culture law is this, I think there should be no restriction as to the section.

Under the town-site law an incorporated town has the right to take up a certain number of acres according to the population. Then under the act of March 3, 1877, they were allowed additional entries not to exceed 2,560 acres in any case. In this Territory the legislature has incorporated villages and towns so that it is possible, I have been told, and I believe it to be true, that a man could enter the northern part of this Territory and go out of the southern limit without getting outside of incorporated villages, and that permits them under the law to exclude a person who would want to make an entry within the incorporated limits of a village, although the village might not be settled. Any person they do not want in their incorporated towns they can prevent taking up lands in that district. That is the construction given to the law, though I do not think that it was the law. It is vexatious and prejudicial to the interests of the country.

Concerning mineral claims I am hardly in favor of a square location. I think the chief objection to that would be that you would have to take such a large tract in order to protect persons in deep mining that it would prevent prospecting in large areas of ground. I suggest that as an objection to square locations.

I think that registers and receivers should have the right to go away from their office to take proof and evidence whenever the interests of a large body of settlers require it, and I think it would be a good idea to give to registers and receivers the power of inspection officers. I think it would be an excellent thing to devise some simple method of distributing the decisions of the General Land Office upon all land-office matters to the various district offices.

Testimony of James H. Nounan, miner, Salt Lake City, Utah.

JAMES H. NOUNAN, of Salt Lake City, testified September 15, 1879, as follows:

I have been a miner for some fifteen or sixteen years. I think there ought to be a square location about 1,500 feet by 1,500 feet, for the reason that there is not one man

in a thousand but requires a considerable amount of timber, even if he has a sufficiently large dumping ground, and if they could acquire title steadily to the land it would be far better for the prospector to come into this office and file upon the land, and then be allowed to make final proof within twelve months. I have had some experience in that direction. I have been prospecting extensively and spending large sums—several thousand dollars—upon different claims, and then the trouble was so great to get a patent that rather than expend the money to get a patent I would expend it in working the mine, without ever acquiring title. The result was that I lost nine-tenths of the claims I had, while if I had had a speedy way of acquiring title I would have had my claims secure.

Under the present law it requires $100 worth of work per annum to acquire a title, and yearly payments all the time until the patent is issued here. The government is without its acreage, and the party himself has no security for his claim. He might be called away without the least fault of his, and some one else jump the claim. There is much needless litigation, too, under the present law. If the prospector were provided with a speedy and simple way of acquiring title to his land, he would always do it. I think the whole routine of acquiring title ought to be done in the district land offices, and that the recorder's office should be abolished.

I was United States timber agent for some years. I have had a great deal of experience in timber matters. I know that there is not only immense bodies of timber destroyed annually by fires, but that nine-tenths of all the timber that is taken from the public land now is taken without stumpage being paid. I would put this matter under the district land office, and I would sell the timber land. I would have it all surveyed and sold, requiring the possession of agricultural land by the party applying as a condition precedent to pre-empting it. I would sell it to actual land owners at the rate of from $2.50 to $5 an acre, in proportion to the land actually sold. I would not sell it to everybody. I would cut this timber land up into 10-acre tracts. All the timber land is worth something. A great many of the farmers would just as lief have timber land with a small growth upon it as large timber, because the small timber is more accessible. This small timber is mostly quaking aspen and scrub or small pine. It makes the very best of fuel. The heavy pine is confined to the high mountains, and is hard of access. It is a costly process to get the timber. What you want is to get the timber lands into the hands of the people, because when they own the timber they will protect it. There has been so much timber destroyed by fire I think it is time the government should take some action in the matter.

If a man is allowed to take up this timber land and acquire title to 10, 20, or 40 acres, as the case may be, it identifies him with the timber and he will protect it, and thus he will protect other timber around his. I think also that the owners of mines, mining companies, &c., should be allowed to take timber as they need it, in quantities not to exceed 40 acres; allow them to buy in that much timber land. They would rather buy timber delivered to them, and I can imagine a case (where the necessity is forced upon them) where, to protect themselves, they must have the timber. Of course I would not allow them to take up all the timber, and thus make others suffer. Many of the mines and prospects are worked under lease, and I think those mining them should be permitted to go and cut such timber as is necessary for the development of the mines. As it is now, they will ride right in sight of a fire and will not put it out. Nobody has the care or custody of the public forests. Fishermen, hunters, and prospectors are careless about their camp-fires. Prospectors are more careful than any one else. They know the value of the forests; but hunters and fishermen are very careless. There is nothing to put the fires out with; they exhaust themselves after consuming large quantities of timber. I know of one man who built a little mill on a mountain-side, and the water ran dry so that he had to leave it. This man had cut down five thousand fine trees, that now lie rotting on the ground.

I believe in selling off the arid pasture land to the people, no matter in what quantity. I think these lands are worth about 25 cents per acre. I believe people will buy them at that price. It is difficult to draw a line classifying these lands. I would confine the term *arid* to lands where there is no water for the purpose of irrigation.

I wish to qualify my statement concerning the timber lands. I would allow the owners of mines upon which had been expended the sum of $10,000 to pre-empt timber lands not to exceed 40 acres in extent, but I would not allow a mere prospector to pre-empt the timber land; but I would allow prospectors to cut all the timber that they want for temporary use.

Testimony of Charles Popper, cattle raiser, Salt Lake, Utah.

CHARLES POPPER, resident in Salt Lake, by trade a cattle raiser and butcher, testified, September 10, 1879, as follows:

I have about 3,000 head of cattle. I keep them on my ranch on Green River. In summer-time I keep them on my mountain ranch back of Green River, at an elevation

of between 6,000 and 8,000 feet. The range is about 10 miles square. There is no association of cattle growers here, and we have no way of protecting ourselves against the inroads of other cattle owners, which usually causes us trouble. The local law here does not protect a man in his range. I do not own any improved land. At present the water is very scarce. It is an exceptional year; ordinarily there is plenty of water for my stock. I have my range well stocked—as much as it should be. I think these questions ought to be settled promptly. The present unsettled condition of affairs tends to the destruction of the cattle interest. It requires so large an amount of capital to buy pasture lands that if they had to buy their land it would exclude men from going into the business—that is, men with a reasonable amount of capital, and at present prices. I do not believe that pasturage land should be sold at all. I think it should be leased, and for this reason: This country might all be occupied and ultimately settled in time to come, and it might be detrimental to the government to sell the lands now at such a trifling cost as would justify men in buying large quantities, or to give them away. I would not favor buying in any large amounts; it would be monopoly. My plan of leasing the lands would be better than dividing them into pasturage homesteads. If a law could be made so as to protect the stockman and tax the cattle he would have a possessory right to that range and be able to keep others from jumping in upon him. I think it would be a very good idea to allow one person to have 3,000 acres of land; then, in order to protect the present owners of stock that are now here, to allow them to purchase sufficient land in excess of the 3,000 acres as would support the cattle they now have.

As regards increase or decrease of the rainfall in this country, I would say that I have lived here ten years, and the rain has stood about the same up to this present year.

As regards the number of acres of pasturage lands in this State that would sustain one beef, in my opinion it requires a person to use the range in order to come to any correct conclusion as to the number of acres of a particular tract of land required to sustain one beef. I should say 10 acres to a beef on my range. I mean, by 10 acres, 5 acres on a winter range and 5 acres on a summer range.

A sheep is an animal that is close in grazing. In the first place they tramp the ground more than cattle do, and in the next place they bite down into the roots so that the grass will not grow. I think five sheep will stand against one beef. Sheep and cattle won't go together. I have heard of some conflicts occurring between cattle and sheep men.

I think that cattle can be better kept upon a range which is fenced, better fed within inclosures, will make better beef of an improved quality than if you move your cattle from one range to another. There have been a great many small cattle men in Northern Utah, but they have gone out; they have been bought out by other parties. The tendency in this country has been from year to year to consolidate the small owners of cattle. I will give you an illustration of this. When I first came here I was engaged in the butchering business. I could get at any time, even on the outskirts of the city, as many good beeves as I needed. All I had to do was to go across the river and get the cattle; but ten or fifteen years ago the country commenced to grow up and the cattle were driven farther off. They have adopted a new fence law here, that cattle, if they come on a man's land, shall be held liable for damage. This is a local law. Many people make a business of driving the cattle on to their land and thus obtain the price for improving them. When I went where I am now there were no other persons near me. Now they have made a settlement right next to my range, and cattle men drive their cattle over on my pasturage, so that I shall have to look for another range.

Another reason why small men go out of the business is that they have to drive their cattle a long ways, and there is no security for them because there are no fences. Ranges in this country decrease from year to year by being overstocked. It takes more grass to keep a herd next year than it does this. Grass must sow itself just as any other plant. We have bunch-grass on my range and also blue grass that grows on the bottoms. Now grass seeds in the fall, and you must give it a chance to seed itself. If it is eaten off, seeds and all, it does not come up again, and this destroys the range. If we had a large tract we might by using part at a time protect the seeds, and thus keep up our range. If we were permitted to fence and otherwise protect it the grass could be increased. It is my opinion that if settlers could acquire possession of large ranges a great many people in Utah would be disposed to go to work and raise tame grasses, like timothy, red-top, &c., to winter their herds upon. They could cut these grasses for hay for their stock, and that would tend to rebuild the stock interests of the country. The thing is done now to a great extent. I have one little patch of five acres that I have cut fifteen tons of hay from in one season; and I have one patch that I have cut off the five acres sixty tons of "lucerne;" then again I have 40 acres that I have not cut 20 tons from. This is due to insufficient irrigation.

Question. You stated that you had three thousand head of stock on your range, which is about 10 miles square each way; that would be 100 square miles, or 64,000

acres. Divide that among 3,000 or 4,000 head; that would give about 20 acres to each beef, would it not?—Answer. Yes, sir; that would be sufficient for them, but there is other stock running on the range besides mine, and they are eating out the range very rapidly.

Q. There is another serious proposition of leasing the public lands, which is this: that it would require a swarm of officeholders to collect the rents. Would it not cost the government more to collect the rents than it would come to?—A. No, sir. I think there is a remedy for that. There would be places provided at which to pay this rent, and there should be heavy penalties, so that it would be cheaper for a man to come up and pay than to try and get around it. I do not think it would require many men to watch the land to see that grazers do not get grass for nothing. A man in possession of a piece of land would see that there was no encroachment upon it, and if a man adjoining any other man encroaches upon it the occupant will be put to seek the remedy. If the penalty is severe enough, they will come up and not take the chances of their neighbors' reporting their delinquencies. Thus, unless persons living on the public lands paid the rent they would be trespassers. I do not think that such a course would, as suggested, give rise to a myriad of lawsuits and quarrels, and cause such friction in the management of affairs as to destroy any good that might come out of it, or make the government very obnoxious in attempting to enforce the penalty. As it is, the government gets no rental at all; and if the rental was made very light it would not be obnoxious. It could be very light and still bring in a revenue to the government. I would make the rent light, but the penalties heavy.

Q. That makes the government of the United States, then, the landholder and all these citizens the renters and tenants. Is not that paterning too much after a monarchial form of government?—A. Well, inasmuch as it is for the protection of citizens, I do not see any objection. It might be better for the government to part with the title of the land to private citizens and let them fix, through local courts and legislatures, or arrange themselves, the prices, instead of having the government do it, if they sold it at a small price per acre.

Q. But your idea is that the lands in the Territory will become settled up in the future and then the government might get a better price for it.—A. Yes, sir; that is my honest opinion. The only thing I fear is monopoly.

Q. Suppose the government should rent you, as a cattle man, for a period of years, say five or ten, these lands at a small rental per annum; at the end of that time would you not conclude that you owned the property? Is it not possible that such claims would be made by the people?—A. No, not any more than there would be in the case of any other leased property through a private party.

Q. Would not this renting large tracts for a series of years interfere with the settlement of this land and take it out of the market for the time being, and thus practically create this land monopoly which you fear?—A. Yes, that would have to be guarded against by adequate provisions. For instance, I own a herd of beef-cattle; in order to protect me from monopolies, I would have to make proof of the number of cattle I had, and as they increased I should have to make application for more land.

I would like to say a word in regard to the causes of fire. I will tell you how these fires which you see on the mountains are created. I pasture my cattle in these mountains because there is pretty good pasture there. The country being dry around here, there was a large sheep-herder thought he would take his sheep on to that pasture. My herders told the sheep man the cattle were there first, and that he ought to go away. The cattle men set their dogs on the sheep, and in revenge the sheep boy set fire to the grass, and it communicated itself to the timber.

I should also like to say a word on the subject of Indian reservations. I have a herd of cattle over on the range on Green River. I have been stationed there for four years right at the mouth of White River. Now the Uintah reservation is in close proximity to that range, and the cattle will drift over onto it. Now, while I have got over there a good many herders, there are certain seasons that you cannot possibly keep the cattle out of the Uintah reservation. I have never had any trouble with either the agent or Indians; I have always compensated the Indians by paying them for their grass, and we always get our cattle off as soon as possible, and there has been no trouble whatever. I want to make a suggestion: why would it not be advisable for the government, in case the Indians are willing, to lease the portion of the reservation not occupied by the Indians for grazing purposes. They receive no benefit from it at all; they would then reap a benefit from it, while at present they have none.

Testimony of W. K. Sloan, manufacturer of charcoal, Salt Lake City, Utah.

W. K. SLOAN.

Resides in Salt Lake City, and has a place of business in Hilliard, Wyo., and is engaged in the manufacture of charcoal.

He understands the present law to be that no person can lawfully take timber from government lands unless it be mineral land. He thinks that some law should be provided by which timber can be lawfully taken, and that the only practicable method would be by a stumpage tax according to the kind of timber taken and the purposes for which taken. The sale of land for this purpose would not be a practical measure, because the timber is scanty and small in size. If persons who take timber for lumber were compelled to buy the right they would be a check upon the charcoal men, who would also be compelled to buy their privileges, paying so much per cord. The cordage could be readily ascertained.

He is of the opinion that the amount of tax which could be reasonably imposed and collected would be 50 cents per thousand on lumber, and about 10 cents per cord on wood used for charcoal. A cord of wood will yield 40 to 45 bushels of charcoal, worth 5 cents to 5½ cents at the charcoal furnaces. The quantity of wood yielded by the heaviest timber land is sometimes 50 to 60 cords per acre, but over three-fourths of the land the yield would not exceed 10 or 12 cords per acre.

The destruction of timber is effected by careless hunting and fishing parties, and still more by Indians. If the timber rights were sold persons purchasing them would be at once interested in checking them; nor would there be any serious tendency to strip land of all its timber, but merely to take whatever might be usefully and properly taken. It does not pay for any purpose to take timber smaller than 6 inches in diameter. Smaller sizes than that are not desirable for charcoal, and would yield coal too fine.

Testimony of George Stingfellow, interest in canal, Salt Lake City, Utah.

GEORGE STINGFELLOW, of Salt Lake City, testified, September 15, as follows:

I am interested in the canals south of the city, and also in the development of the country.

My chief suggestions are concerning the desert-land act. I think it is a very good law, but a section of land is considerable, and I think one-half a section would be ample to give under that act. There is considerable land in this valley, and I presume there is more elsewhere, that has been taken up under the desert-land act with the expectation of getting it through irrigating canals, and many of the people who have taken up these lands thinking they will be able to accomplish this work inside of three years cannot do so, and I now see that they will not be able to accomplish it. I have been laboring faithfully, with a great many others in this valley; we cannot accomplish the irrigation of the land in time. We have all spent money, thousands of dollars. I think the law should be extended two years more, making it five years, for this reason: We have all taken up land and expended means with the idea that we would get it done within three years. The canals have taken more time and money than we thought. I speak of the "Draper ditch." There should be a general law extending the time of entry under the desert-land act, and it should be done immediately, or we will lose what money we have expended because of the expiration of the time. We are compelled to have it done, or else the time we have expended and the money—$50,000 to $75,000—will be lost; and I do not think we should be deprived of both the land and the money because we cannot get the ditches done in time.

Testimony of John Tiernan, John T. Lynch, and others, of Salt Lake City, Utah.

SALT LAKE CITY, *September* 13, 1879.

To the Public Land Commission:

GENTLEMEN: It would appear that to give parties as good a title to lode claims as it is within the power of government to do, the area of the surface ought to be increased. On reflection we would call your attention to what we believe will obviate, as far as possible, the present vexatious and complex system of the laws governing the acquisition of lode claims.

First. Make but one size of claim, say a parallelogram 1,000 feet in width by 1,500

feet in length, this to be the size of all claims except in cases where surveys have already been made which prevent a locator from taking a claim as herein provided, in which event a claim can be made to conform to the unsurveyed surface, but not to contain a greater area than 1,000 by 1,500 feet, but a less area than this if such surface will not allow the full amount.

Second. The locator shall be entitled to the vein or veins contained within such surface on their dip as far as the same shall extend in depth.

Third. The end lines of claims to extend down vertically.

Fourth. If the party making such location alleges that he has a mineral location, it shall be considered that such is the fact.

Fifth. When such location is made the locator shall place corner posts and notice on the claim, and then file his location notice and statement in the local land office within the district where his claim is situated, for which he shall pay a fee of $5.

Sixth. When such filing has been complied with it shall then be the duty of the register and receiver of said land office to cause a survey to be made within ninety days, the cost of such survey to be paid by applicant.

Seventh. The applicant shall have twelve months from the date of the approval of the survey in which to pay the government price for the area of such claim, and shall be allowed the amount already paid for survey as payment toward area.

Eighth. If at the expiration of the twelve months aforesaid such applicant shall fail in which to pay the same, then the said location shall revert to the government.

Ninth. In the event of any such reverting to the government, then the same shall be open for entry by any person who will pay for the survey again, and such applicant shall then have twelve months from the date of such payment in which to pay the government for the same.

Tenth. Further, such rule to be continued until such claim is disposed of by the government.

Eleventh. In consideration of the government granting such an area to lode claims the system of locating mill sites and tunnel sites should be abolished, as such have always been a source of annoyance and a detriment to the mining community, the said area being sufficiently large for any owner thereof to erect mills, &c., and the rule will equally apply to tunnel locations, the objects of which are for the discovery of blind lodes, &c. This method of acquiring title to lode claims and the easy manner in which it can be done will enable a locator to cover blind lodes with such location.

Twelfth. In the event of the passage of such a law the cumbrous and defective system of district recorders and local mining laws should be abolished, the records in the land office being sufficient to perpetuate the title until patent issues.

Thirteenth. If such a law can be passed, the solution of how to clear out of the way all old claims, which are, at best, imperfectly represented, and nearly always a stumbling-block against the development of the mineral resources of the country, can be easily reached.

Fourteenth. From and after the passage of such a law give all owners of lode claims and mill sites located prior thereto six months in which to apply to the local land offices for a survey of their claims and to pay for such survey, and twelve months thereafter in which to pay the government price for area, and at the expiration of the eighteen months all claims not so paid for shall revert to the government and be held to the rule as laid down in sections 8, 9, and 10. Therefore, in eighteen months from the passage and active operation of such law, the lode claims of the public domain will be held either by *bona-fide* owners or become public lands again, and in such shape as can be controlled by the government, the rightful owners.

Fifteenth. It is not necessary to compel persons to do a certain amount of work on claims, from the fact that the survey required to be paid for by locators is better than to require labor to be performed, which is problematical, if in a majority of cases much is ever done under existing laws.

Sixteenth. Such a law as is here contemplated allows the government to control its own domain at a minimum cost until it parts with the title for actual money, whereas by the law as it now stands persons can perpetuate their claims indefinitely, and the government cannot have jurisdiction of its own, neither receive pay for it—a rule contrary to all business principles.

Seventeenth. The effect of such a law will be to create confidenee in mining on lode claims, it being a guarantee to investors and capitalists that their investments will be as safe from attack by contesting claimants as any ordinary business transaction.

Eighteenth. It may be argued that, as the law does not provide for assessment labor, little or no labor will be performed. It must be borne in mind that the requirement of perfecting title is of paramount importance, and from the inception of such location the title is so guarded for the owner that the probabilities are that much more labor will be performed than under the old law, where a person is compelled to do labor or perjure himself on a doubtful title, as is done in a great many instances.

Nineteenth. That all disputes or contests in regard to mining lands should be set-

tled before the United States land officers, the same as under the homestead and pre-emption laws, until patent issues.

JOHN TIERNAN.
JNO. T. LYNCH.
L. U. COLBATH.
WM. F. JAMES.
J. E. MATTHEWS.
M. K. HARKNESS.
B. MACKINTOSH.
C. K. GILCHRIST.
D. H. BENTLEY.
ANTHONY GODBÉ.
CHAS. READ.
W. H. H. BOWERS.
A. K. SMITH.
H. W. LAWRENCE.
JOHN CUNNINGTON.
ALEXANDER ROGERS.
JOSEPH G. WALKER.
SAML. KAHN.
GEO. R. AYRES.
W. S. GODBE.
F. J. P. PASCAL.
GEO. M. SCOTT.
G. S. ERB.
EDMUND WILKES.
S. L. BAKER.
Dr. G. SPOARRY.
B. W. MORGAN.
EDWD. J. HALL.
JNO. M. MOORE.

Testimony of Alexander Topence, stock raiser, Salt Lake City, Utah.

Mr. ALEXANDER TOPENCE, residing at Salt Lake City, testified September 10, 1879, as follows:

I have been engaged in stock raising in the northern part of Utah Territory for the past ten years; since about 1869. In my portion of the country bunch-grass is the principal feed for cattle. I have been compelled to move my stock frequently and leave, and also been compelled to fence land in order to save ranges and keep other stock out. This has proven very advantageous to me. On the bunch-grass ranges you must not let the stock pasture both during winter and summer. I have a summer and a winter range, and sometimes I hire a range. I do not hire the land, but I hire some one else to herd the cattle for me on their range. In Utah grass is very much limited and the principal reasons are that sheep are coming in and overstocking the ranges. The practice of rushing on to and overstocking a good range, when it is discovered, has destroyed them to a very considerable extent. That is the reason I went out of the cattle business. Bunch-grass is very quickly destroyed by overfeeding. If you feed on these ranges for three years, year in and year out, it will destroy the range.

If you take your stock and keep them on one range in the winter and another in the summer, that allows the seeds of the grass to fall and does not destroy it. If the grass is destroyed in seed-time it is entirely destroyed, and when the range has once been eaten out in that way it will take five or six years before grass amounting to anything will grow again. I can show you ranges that used to cut a ton and a half of bunch-grass to the acre and which are now entirely bare, and sheep are much worse than cattle are on the grass. It is a common practice whenever grazers find a nice range, although it may be occupied by another, to rush their cattle upon it and destroy the range. This is a common practice. If they do not drive their cattle in among those already occupying it they will drive them into the vicinity, and there is no local agreement or understanding to protect cattle raisers. I think the practice tends to the destruction of the pasturage throughout the Territory, and the destruction of the stock interests also.

The remedy I should propose for this state of affairs would be that the government should lease or let these pasturage lands that you cannot cultivate at all. There is very little land in the foot-hills that can be farmed, and I think the best thing to be done will be to lease it, say in 5 miles square, and then the government would have to protect those to whom it leased. I do not know what would be a fair price to pay for these ranges for a term of five years. I have not figured upon that. It would take 5 acres to each animal. As far as my means of determining, approximately, the land necessary to pasture a head of stock goes, I think it would take 2, 3, and 4 acres of bunch-grass to each animal; that is, when you first turn in your cattle upon a new range. I do not think you would feed a range down by having 4 acres to the animal.

As regards the altitude for stock ranges, for small ranges, the higher we can go the better it is. Cattle do best on the highest peaks in summer, but you cannot do anything on the mountains in winter; then you drive them into the valleys.

If the government should find the leasing of lands to be inconvenient and objectionable, I cannot suggest any other method of disposing of its pasturage lands unless the land were sold for some price that stock-raisers could afford to pay. I think that stock-raisers could generally afford to buy considerable tracts of land, and that some men would purchase such tracts at 25 cents per acre. A man could afford to buy at

that price. I would rather buy at that price than graze it as it is. I would then fence it. We use this wire-fencing, as we have very little timber. That is the great difficulty in this country; there is no timber to speak of.

As regards the number of herders required to take care of 1,000 head of cattle, it is altogether owing to the locality in which you are. If you are in a secluded valley with 2,000 cattle, all you want is a man and a boy, because one man does not want to stay alone. In the branding season, however, you want more. You generally watch your herds in such a manner as to be sure that no cattle, except now and then perhaps one, stray away from your lands. We keep herders on certain ranges that I have busy with the cattle, and if there are any cattle going out they follow and drive them back.

As a general thing we keep our cattle pretty well rounded up, and try to guard them from going off the range. We lose a great many cattle by poisoning in the spring. There is a weed that grows in the spring that poisons them. We call it sea-kale; and then we have the wild parsnip, which is also poisonous to them. We pasture our cattle high up in the summer and drive them down in winter. I think it would be a very good thing if these lands were opened up to private entry at a low price, and that the wants of the stock raisers would be met in this way to some extent. The price should not exceed 25 or 50 cents an acre, and then I think the lands should be classified. A man had better buy it and be protected than allow his cattle to go as they do now. If you have a permanent range, the stock raised there will remain; but if you have to move often, owing to the encroachment of some other persons, then it takes horses and men and costs a great deal of expense, and therefore I would rather have a range that I owned.

Horses and cattle will soon become attached to a range, and I have known horses to go a hundred miles in forty-eight hours to get back to their old range. The changing of a range entails considerable loss, for it makes your cattle poor through driving, and to move the cattle it requires additional horses, herders, &c., and also to keep them on the new range until they have become familiar with it.

If I were enabled to acquire some sort of possessory title I would be able to raise grass for my stock. I have been raising some grass; but unless you have water you cannot do anything. It will pay stock raisers to raise grass if they have the water. Tame grasses, like timothy, blue-top, &c., get ripe enough in this country to make hay about the 1st of July. Wheat would be ripe to cut in the same locality about the same time; they have cut wheat here in June, especially if it be a dry season; this year wheat was cut as early as the 10th of June. Wheat and grass generally go together.

In irrigating tame grasses it is not necessary to use the water at the same time it is for grain. Here we generally turn the water on in winter and allow it to freeze; you cannot injure the grass then. In this way we avoid irrigating in summer. In such streams as Snake and Bear Rivers, and others of that character, we have the highest water about the 1st of June; that is just about when we want it. The waters of the Malad are highest about the 1st of May. If there were large farms for raising hay and for pasturage purposes by irrigation, I don't think the irrigation of the grasses would interfere with the use of the water for agricultural purposes. You can irrigate your grass in winter, and when the crops require irrigation the grass no longer needs it. We have either got to have land pass into private ownership in large tracts, so that there will be some encouragement to raise tame grasses in order to winter the stock, and in that way increase the stock interests of the country, or else we cannot carry on stock-raising hereafter. My idea is that unless artificial means are provided for supplying grass the stock-raising interests of this portion of the country must go down. It is going down all the time now, and there is no hope of artificial improvements by private parties unless they own the ground.

Question. I understand your idea to be, that the stock-raising interests of Utah will be utterly destroyed by the grass being eaten out, and it is eaten out, because other men have come in upon men's ranges and overstocked them; and in order to remove these fellows, you think it is necessary that some means should be provided by which an individual should be enabled to secure his occupancy of a range?—Answer. Yes, sir, I do; and I think that under such a system as that the stock-raising interests of Utah would be very much promoted, and that it would be an encouragement to the raising of tame grasses, and in no other way can the stock-raising interests of Utah be built up. If a man is not protected in the use of a range, everybody's cattle have the same right that he has. It is absurd for a man to make five or six thousand dollars' worth of improvements for the use of somebody else. Selling men the land and protecting them will enable them to raise tame grasses.

Q. Are all, or nearly all, the valuable pasturage lands taken up and fenced, under the Territorial law of Utah?—A. No, sir; not one-sixteenth. I believe there was such a law passed by the legislature. If a man could buy this land for a small sum, and go to work and put up artesian wells and fence the land that such wells would cover with water, it would pay them. Suppose I go and sink an artesian well, sometimes 100 feet or more, capable of watering 1,000 head of cattle; some one else comes up, turns his

cattle loose, and they go right to my well. You cannot move his cattle, because he says you don't own the land any more than he does.

Q. Have you any flowing wells here?—A. We have a few. There are eight at Grantville. The depth of them is 175 feet. They have irrigated 200 acres by means of them. They were sunk last year; they are 200 miles north of here and cost $1.50 a foot without pipe, and 50 cents a foot more for the piping.

Cattle are worth about $14 per head here taking it all through. That is not improved stock. They are what we call Utah stock. But now they are bringing in many fine bulls. If the ranges were owned by the persons who own the stock that would tend to improve the stock. I am improving stock now; I have a bull worth $1,500; I have him fenced; it would be foolish to improve stock when it is among somebody else's. The altitude of my range, which is in Idaho, is about 5,500 feet.

Montana is a good stock country, but it is getting fed off just like this country.

The trouble of the government selling off these pasturage lands, even if they increase the number of acres so that a man could take his family and settle upon his homestead, is that it would not reach the cattle men. You take a man who goes into the cattle business; he does not want to be limited to a few acres. Still I think it would be a very good idea to divide this land into pasturage homesteads at reduced prices. And I should say that in order to make the plan at all successful it would require 2,500 acres for each homestead. It would take at least 10 acres to the animal, but it is hard to say how many cattle could be supported on 2,500 acres of average grazing land.

Sometimes you will find 500 acres of land with not a spear of grass upon it. Then again there are 500 acres that are pretty good grazing land. I think that a man who had 150 cows could, with close economy, support a small family—say, a wife and three children—that is, if he sits down, takes care of his stock, and fences and raises a few vegetables, he might be able to live. He could sell, if he had good luck, 50 steers each year.

Q. If your theory is correct, and if 150 head will support, with economy, a small family, and 10 acres of average land would support a steer, that would make about 1,500 acres which would be absolutely necessary for a pasturage homestead?—A. Yes, sir; 1,000 or 2,000 acres. I have seen land, though, that would not do any such thing. And then again I have seen land 4 acres of which will support a beef, if it is fenced. I consider it desirable to have bunch-grass land.

There are some sheep in this country. If a sheep man comes on your range with his sheep and you can manage to bluff him off and get him away, all right; but if you do not, they will ruin your range. If these lands were sold and fenced it would prevent all this trouble; otherwise, it is the public domain, and every man can range where he pleases.

I have taken up some land in Idaho under the desert-land act. I am carrying a ditch to it which costs $1,600. This land was taken up under the desert-land law at 25 cents per acre. Now, unless I can prove up on my land next year—I mean that to which I am carrying an irrigating ditch—I will have to lose it. I am doing this in company with other men, but I myself have expended this much money. But we cannot get the water in the ditch this year, and if we do not we must lose it, because we will not have complied with the law. We would produce nothing until we got the water upon the land. I think there should be an extension of time to allow us to get the water on the land.

Suggestions of Edward B. Wilder, James F. Bradley, S. R. Dickson, W. H. H. Bowers, and Prof. J. H. Morton, at Salt Lake City, Utah.

SALT LAKE CITY, *September* 10, 1879.

DEAR SIR: Owing to a pressure of business, I find that it will be out of my power to confer with the commissioners, Hon. J. A. Williamson and others, in this city relative to a revision of the mining laws as they now exist, and, by simplifying the same be the means of effectually putting a stop to litigation that is proving most disastrous by capitalists to the miner of limited means.

The suggestions as made by Mr. Burgess to the gentlemen comprising said Commission I most cheerfully concur in, and having been engaged in mining, engineering, and surveying in Cuba where the Spanish laws relative to mines and mining claims predominate, viz, permitting the locator to locate 100 varas by 200 (or, in round numbers, 300 by 600 feet) as a mining claim, within which boundaries he is confined to vertical lines extending downward, irrespective of the vein in its dip passing out of said bounds.

I therefore beg leave to present the commissioners the following: Cause each mineral location hereafter to be made 500 feet wide by 1,000 feet long whose veins shall be confined within said boundaries by vertical lines extending downward from the side and end lines of such location to an indefinite depth, giving such locator the

privilege to locate adjoining his first location a series of additional locations of similar dimensions, not to exceed three in number. By pursuing such course it will hereafter put a stop to litigation and perjury so common in our courts in Utah, by preventing a parcel of unmitigated scoundrels from purchasing abandoned claims for no other object in view than to swing them over the claims of honest men.

Also, by the decision of the Acting Commissioner, Mr. Armstrong, the claimant of a mine must be the person to make affidavit that the notice of application for patent and diagram remained posted the sixty consecutive days. No agent, attorney, or other party can do this according to this decision, as in the case of the Saratoga mining claim, in West Mountain mining district, where the claimants, residing in Saint Louis, had their appointed legal officer to act for them.

Would it not be better to allow two disinterested parties (cognizant of the fact that such notice was posted and remained the sixty days required by law) to make such affidavit in place of the claimant? The owners of a mining claim may be in Europe or elsewhere, and if any one can sign such affidavit, it must in justice be done by parties on the ground who know the posting to have been done for the period designated.

I am, respectfully, yours,

EDWARD B. WILDER,
Mining Engineer and United States Deputy Mineral Surveyor.

Col. C. L. STEVENSON.

Suggestions of Prof. J. H. Morton.

In making a location allow the locator to make his location 1,500 or 1,000 feet square, and he to be thereafter confined to the mineral within the vertical boundaries of his claim; have his claim defined by posts on each corner; compel him to do his assessment work in the beginning of every year, the year to commence on the 1st day of June in every year; have the work certified to under oath before the recorder.

In recording have the records made within the district, the district recorder to forward to the register of the land office a certified copy of the notice of location, to be entered in a book kept by the register of the land office.

Give the locator five years in which to obtain a patent.

In making a relocation of a claim the party making the relocation shall give the name of the claim he wishes to relocate, and if the recorder shall find that the claim has not been worked according to law, he shall enter the notice; if the work has been done, the application shall be refused.

J. H. MORTON.

Suggestions of James F. Bradley, mine owner.

1. Amend the present law by allowing, say, two months from date of location of mineral claim, within which time the locator may ascertain the course of the vein and make his side lines correspond with the strike of the vein.

2. Secure by formal enactment to the locator of a mineral claim the right (absolute) to the control and use of all springs and running water within the boundaries of his claim, and which have not been actually appropriated for practical purposes prior to his location.

3. Guarantee in terms the right of the locator of a mineral claim to a mill-site with water privileges (made in connection with said mineral claim) so long as the claim is worked in good faith, without requiring any improvement or outlay on the mill-site or water privileges as a condition of possessory right.

JAMES F. BRADLEY,
Mine Owner.

TENURE OF WATER-RIGHTS—LAWS AND DECISIONS COLLATED TO DETERMINE THE POINT.

Second in value to the mines of our mineral districts are the mill-sites and water rights adjacent or contiguous thereto. Conflicting opinions and threatened litigation make it desirable that our mining fraternity should be well informed as to their rights under the law in connection with this species of property. Previous to the passage of the United States mining law of 1866, when the unsurveyed and unclaimed mineral lands of the Pacific slope were open to any and all prospectors, it was found necessary, in order to work the placer mines, that water should be diverted from its natural channels and brought in many cases long distances and at large expense to

the points where it could be utilized in washing out gold. Justice demanded and local laws and customs of miners, sustained by decisions of the courts, sanctioned and protected the rights of parties who first appropriated the water thus running to waste. The law of 1866 did not create or enlarge the rights thus accorded, but simply recognized and guaranteed them as just and necessary under the peculiar circumstances.

The common-law doctrine that water cannot be diverted from its natural channel to the detriment of those who use the water and live on or own the land through which the stream runs, might well be ignored under the state of things indicated, for no one lived on or owned the land in question. And so, to a certain extent, this common-law principle was set aside in the cases named. But, while the right of prior possession and appropriation of water was thus recognized, the courts have held, in the language of the supreme court of Nevada, in the case of Van Sickle *vs.* Haines (7 Nevada, 249), "that a patent to land from the United States passes to the patentee the unincumbered fee of the soil, with all its incidents and appurtenances, among which is the right to the benefit of all streams of water which naturally flow through it; * * * and also the same right to recover for a diversion of it as the United States or any other absolute owner could have. That the right of the riparian proprietor does not depend upon the appropriation of the water by him for any special purpose, but that it is a right incident to his ownership in the land to have the water flow in its natural course and condition, subject only to those changes which may be occasioned by such use by the proprietors above him as the law permits them to make of it, and that the common law was the law of the State and must prevail in all cases where the right to water is based upon the absolute ownership of the soil."

The case was carefully distinguished from that large class of cases where it had been held in California and Nevada that priority of appropriation gave a right to water as between appropriators none of whom held the absolute title to the soil.

As it must be conceded that the absolute right of ownership conveyed by patent reaches back and includes the incipient steps required under the mining laws to obtain possessory rights, it follows that the locator who in good faith has located and improved a mining claim has the right to the use of springs and running water thereon unless the same has been appropriated previous to his location and improvement. And this right is inferentially admitted in the case of Leigh Co. *vs.* Independent Ditch Co. (8 Cal. 323), where the court held that "a complaint alleging that the plaintiffs are the owners and in possession of certain mining claims on a certain stream, and are entitled to the natural flow of the water of the streams, which have been diverted to their injury by defendants, set forth a sufficient cause of action. It is not necessary that the complaint should further allege an appropriation of the water or an ownership thereof." And in 6 Cal. 105, it is declared that "possession or actual appropriation must be the test of priority in claims to the use of water, whenever such claims are not dependent on the ownership of the land through which the water flows."

"A stream is parcel of the land through which it flows inseparably annexed to the soil, and the use of it as an incident passes to the patentee." (2, Law, C. C. 176.)

Under the mining law of 1872, water privileges or mill-sites are located in the same manner as mines, subject to local regulation, that is by definitely locating not to exceed five acres by monuments and recording location notices with the district or county recorders.

No immediate improvement is required, and no limitation of time is given when the right to use and improve them shall expire. Indeed, as "reason is the life of law," there is good reason why there should be no limitation. The presumption of the law is that the mill-site waits upon the slow and expensive process of opening and developing the mine or mines to which it is but an adjunct.

When the mine is patented, the mill-site may be included in the application and patented also without one dollar of improvement on it, be it one year or ten after its location. In the absence of statutory law and of any rule or custom of miners in this Territory, the laws of the United States as construed in the courts of the mining States and Territories govern and settle the question of water rights, as follows:

1st. The lawful owner of a mining claim, patented or otherwise, has the right to use the water passing through his claim, and can recover against any one diverting it from its natural channel, unless it can be shown that the party so diverting it had by possession and appropriation, prior to the location of said mining claim, a better right thereto.

2d. Mill-sites properly located and recorded, although unpatented, hold good under the laws so long as the locator, his heirs, grantors, or assigns own or work the mine or mines in connection with which the mill-site was selected and recorded, and a cause of action arises against any outside party who attempts to divert the water running through said mill-site.

Suggestions of S. R. Dickson, Salt Lake City, Utah.

SALT LAKE CITY, UTAH, *September* 11, 1879.

Manner of making and recording mining claims.

Persons intending to make a location should be required to post upon the ground a notice declaratory of their intention, which notice should in a general way describe the direction and extent of the claim, a copy of such notice to be left with the district recorder, who shall indorse upon the back thereof the day and hour which they received the notice. Sixty days should then be given the party to prospect his discovery and determine the course of the lode and to have the same surveyed by an engineer, who should be required to stake said claim, giving courses and distances, and upon his notice of location to mark the same together with a plat thereof, which notice so made with the plat thereof shall be recorded with the district recorder.

Manner of working assessment.

Claim owners should be required annually to appear before the district recorder and there, by two competent and disinterested witnesses, make oath that they have performed said assessment work; and it should be made the duty of the recorder to make record of such work. Neglect on the part of the claim owner or their agent to annually make the above affirmation shall work a forfeiture in the claim and render it subject to relocation.

The recorder should be debarred from recording a notice of relocation upon a claim if his records show that the work has been annually performed. District recorders should be government officers, authorized to administer oaths, and should at stated periods be required to make returns to the surveyor-general's office of the Territory of all recorded claims and likewise of all forfeited claims.

All patented claims in Territories should be taxed annually $10 for road purposes in said district.

S. R. DICKSON.

Suggestions of W. H. H. Bowers, mechanical engineer, Salt Lake City, Utah.

SALT LAKE CITY, UTAH, *September* 11, 1879.

DEAR SIR: At your request, I submit the following suggestions in substance that I think would be an improvement in our present mining laws. It has no reference to any particular system of surveys, but refers to manner of making and completing a mining location; and if deemed of importance, would be well to lay the matter before the honorable Commission now in our city.

The point I wish to call attention to is to the fact that in many mining districts throughout the Western States and Territories there is considerable trouble arising from conflicts in location of mining claims, and the fact is the records in mining districts do not fully describe a location so that a correct knowledge of conflicting claims can be determined or located by an examination of said records. It has occurred to me that this trouble could be obviated by requiring each locator to have his claim surveyed by a regular United States mineral surveyor, say within sixty or ninety days after posting such notice of his location. The same to be platted in the district recorder's office and the proper returns made of said survey to the surveyor-general. A failure of such locator to have his claim surveyed and properly platted and recorded within the time specified should be a forfeiture of his claim.

All claims located prior to 1872 and subsequent to that date should be surveyed, &c., as above within ninety days after such law became of force.

As a means of preventing any oppression on the locator, I would suggest that the first year's assessment of $100 be abated, and that the locator should be entitled to his patent by doing $400 worth of work on each claim; that the original survey should be final, and locator to be required to prove up his work to entitle him to an application and entry by paying the usual land-office fees and price of land so surveyed.

The effect would be security to investors in mining claims who are not familiar with the locality as to conflicting claims. It would also insure a rapid purchase of such claims from the government of all mineral lands located.

Under present system parties will hold claim after thousands of dollars have been expended in development to save the expense of surveys, and the government not receive a cent.

Under present system parties not familiar with location and conflicting titles find, after spending large sums in developing, that an adverse claim has the precedence,

and the result is innumerable lawsuits and annoyances that deter legitimate capital from investing in mines and mining enterprises; from their past experience or observation of others they see themselves robbed, so to speak, of what they really think their rights, but in fact caused by the imperfection of our laws mentioned.

This alone has had a greater and more damaging influence to development of our mineral resources than any other case. Men say if they have a good mine they are robbed of it by some old title that was overlooked in records or so imperfectly described as to guard them. If platted and described, it could be more readily detected.

It is not necessary to refer to any special case, but you are no doubt aware that hundreds of such cases have and do now exist in Utah. The records of our courts also substantiate this trouble.

As no one feels a greater interest in the development of our mineral resources than I do, I would be glad to see some law passed that would prevent such conflicts and insecurity to investors, and hope this or some better plan may be adopted speedily by Congress in amending our mining laws.

Respectfully, yours,

W. H. H. BOWERS,
Mechanical Engineer.

Col. CHAS. L. STEVENSON,
Mining Engineer.

Suggestions of E. B. Wilder, Edward Wilkes, Lewis J. Hohnes, Joseph Gorlinski, Thomas E. Bailey, and Charles L. Stevenson, committee of civil and mining engineers, Salt Lake City, Utah.

SALT LAKE CITY, UTAH, *September* 11, 1879.

To the United States Land Commission at Salt Lake City, Utah:

GENTLEMEN: We transmit herewith a digest of the suggestions offered at a meeting of civil and mining engineers of Utah concerning a modification of our mining laws and the instructions thereunder.

E. B. WILDER,
EDMUND WILKES,
LEWIS J. HOHNES,
JOSEPH GORLINSKI,
THOMAS E. BAILEY,
CHARLES L. STEVENSON,
Committee Civil and Mining Engineers of Utah.

Suggestions made at a meeting of civil and mining engineers, Salt Lake City, Utah.

Mineral monuments and meridian line or lines in each district. A proper base line also between two of the principal monuments, established at government expense.

District recorders to be elected by a vote of mine owners, as heretofore. Such recorders to furnish the United States with a proper bond for faithful performance of duties; such bond to be satisfactory to the surveyor-general of the Territory.

When a notice of location is made in the district records, a certified copy to be also immediately filed with the surveyor-general. And *quere:* Whether a full copy of past records should not be filed with surveyor-general?

All relocations should be recorded as such, and the name of the original claim given, or otherwise to be void.

Upon unpatented claims oath should be made by the owners or their agents and two witnesses, before the recorder, that the yearly assessment work has been done, and such statement be placed on record, and in that case the recorder should be obliged to refuse the recording of a relocation, and so prevent expensive litigation.

Quere: Whether local laws should or should not abridge the width allowed by the United States law?

Quere: Old Spanish law *redivivus* as to surface locations?

United States deputy surveyors should have the privilege to swear their assistants in and out. The surveyors often have to travel great distances to find the office of a notary or a justice, and then on arrival find the officer absent, the costs incurred in some instances equaling the cost of survey. (*Vide* instructions November 20, 1873.)

Owners of claims made prior to 1872 should be obliged to amend notice of location by official survey, stating clearly course and position of the lode or vein, and mark their boundaries distinctly on the ground, it being understood that the amended notice does not interfere with their prior rights.

Quere: Whether parallel end lines are essential?

The number of each mining claim officially surveyed should be on record with, and the deputy mineral surveyors shall give the same to, the district recorder.

Appointment of a mining inspector to look after the safety of mines and miners.

Surveyor-general to have power to restrict the number of deputy surveyors.

EDWARD B. WILDER.
EDMUND WILKES.
LEWIS J. HOHNES.
JOSEPH GORLINSKI.
THOMAS E. BAILEY.
CHARLES L. STEVENSON.

Testimony of Edward B. Wilder, United States deputy mineral surveyor, Salt Lake City.

The questions to which the following answers are given will be found on sheet facing page 1.

To the honorable Commissioners of Public Land Commission:

GENTLEMEN: I have the honor to present for your consideration the following answers, replying to a portion of the interrogatories propounded in the circular issued by your honorable body, viz:

Name, Edward B. Wilder; residence, Salt Lake City; occupation, mining engineer and United States deputy mineral surveyor.

On the subject of lode claims I would respectfully suggest in connection with the interrogatories the following:

1. Thirty-nine years, of which seven years were in the Cuba mines, Island of Cuba, as superintendent and mining engineer, and the remaining thirty-two years in different sections of the United States, including three years as superintendent, mining engineer, and mining expert of the Ophir mine, on the Comstock lode, State of Nevada; as also seven years of the above period in this Territory as mining engineer and United States deputy mineral surveyor.

2. I find many defects, in which my subsequent replies will explain.

3. The present official practice has fully demonstrated the practice to be erroneous, inasmuch as it is productive of litigation. If all surveys hereafter to be made were in the form of a parallelogram there would be very few adverse claims—say 500 by 1,000 feet, or, as the present law now stands, 1,500 by 600 feet.

4. The top or apex of a vein or lode is the point at surface where the ore is met with, either superficially seen in the croppings or just beneath the surface. The terms I consider vague, inasmuch as denudation would have a tendency in a soil free from impediments, as rocks, &c., to expose the ores lying some distance beneath the surface, thus opening a field for difficulties in the future, while perhaps the legitimate apex would be considered as at the outcrop of the vein; and there are very few exceptions but what, after sinking a few feet, the dip and course can be determined sufficiently to make a survey of the location. The Ophir mine was an exception as regards the dip, for in the first developments made the dip was west, and after an incline shaft had been sunk on the vein for over 200 feet a cross-cut was driven from the bottom over 150 feet east, when the walls were found; the hanging wall in the first instance became the foot wall, and has continued as such for over 2,500 feet in depth.

6. It has most decidedly, as in the case now before the courts of the Stewart mining claim against the Edison, when the so-termed apex was found on each claim; the result being that the claims being contiguous in part, the foot wall of the Stewart crosses the side line of the Edison diagonally, and hence the expensive litigation now in progress.

7. The Stewart and Edison veins, which are formed separate by an intervening mass of country or barren rocks between the two, are as follows: Edison foot wall, N. 5° 45′ E.; Stewart hanging wall, N. 33° E. In the lines of divergence from a point on the Stewart country rock exists between the wall of one and that of the other.

9. They occasionally occur wider than the local laws allow, but very rarely, and in no instance coming under my own observation do they exceed 500 feet in width.

10. They do.

11. It works to the disadvantage of the discoverer of a true vein.

12. In Uintah district is the following: Swift locates a claim; subsequently Evans makes a location from certain infallible proofs and sinks a shaft on the vein; has a survey made for United States patents; Swift then has a survey made which absorbs nearly all of Evans's claim; sinks a shaft 80 feet deep in limestone (while Evans is on the vein) from his discovery, and intends filing a protest against Evans.

13. In almost all cases of litigation the causes assigned are when the vein passes the exterior lines of the surface tract diagonally or otherwise.

14. I do not think it possible that they can without litigation.

15. I have never taken part, directly or otherwise, in organizing a mining district.

16. The general mode of taking up and locating a mineral claim is as follows: One or more individuals start out with pick and shovel; if there are rich mines in the vicinity they generally commence an examination, taking in many instances the general course of the vein as seen on other productive properties. When anything indicative of an outcrop is seen a foot or two is sunk; if they think it promising, a notice is written with pencil, a mound of stones erected, and that constitutes their right to the claim. In other instances locations are made adjoining good mines without there being the least indication of an outcrop, the motive being to eventually "blackmail" the adjoining mines. Again, most of the locations are made without any direction, simply inserting the course northerly and southerly for north and south, &c., thus leaving a margin at the option of the surveyor to swing on.

17. If the original notice of location is amended as regards course and distance, it destroys the former date of same, and the date of such amendment takes precedence.

18. From my own personal knowledge I am not aware of any, but I am informed that accusations of that nature have been made by parties.

19. I would most respectfully suggest that all mining-district laws, customs, and regulations as they now exist be abolished, and all future locations and the initiation of record title be placed exclusively with the United States land officers, their charges being excessive (and are too often under the influence of disreputable parties), giving no bonds, and in fact exercising a baneful influence.

20. The present system of allowing the courts to adjudicate on adverse claims is highly detrimental not only to the litigants but to the government, as it places a barrier to disposing of the mineral lands at once, to say nothing of delays and the great expense attending the same. I therefore am of the opinion that all controversies concerning mineral lands should be left to the United States land officers, in the same manner as contests under all other land laws, with no appeal from their decision except to the Land Office at Washington.

21. I would suggest that the leading features of the act of May 10, 1872, be in a measure retained; that all claims hereafter made should be in the form of a parallelogram, beyond the end lines of which the vein cannot be disturbed by entering another claim; or, in other words, let vertical lines from the surface of such parallelogram constitute the claim downward, and in case the dip of the vein should pass out of the vertical lines, let the owner take up as many claims as may be deemed expedient adjoining, in order to protect the dip of his vein. In other words, an embodiment of the old Spanish mining laws in our present mining laws, after reconstruction, will put an end to this course of litigation that is ruining thousands.

22. There ought to be a limitation as to possessory title under the mineral laws, from the fact that there have been taken up locations by parties long prior to the act of May 10, 1872, who, in fact, hold them to the exclusion of others that would develop them. Many of these locations are made in the vicinity of good mines, with no other motive than to protect the rights of legitimate mine owners, and eventually sell out, as parties holding good properties would rather submit to "blackmail" than be involved in litigation. The mining districts are full of such cases.

In reference to question No. 2, I would say that the principal defects in the United States mining laws are in regard to permitting the owner of a mining claim to follow the dip of his vein outside of his claim, as indicated by his boundaries superficially, which, as before stated, is the inevitable step to litigation. As an instance: the Stewart Company in West Mountain mining district owns a claim, purchased, being an old location unpatented, 200 feet wide. From the northern side line of this location to the south side line of another good mine is a distance of 370 feet. This last claim has made application for United States patent. The former claim, owned by the Stewart Company, filed an adverse claim on the ground that the dip of their purchased claim passed into the claim of the latter, passing through 370 feet unclaimed by their location and undeveloped.

I am very respectfully, your obedient servant,

EDWARD B. WILDER.

SALT LAKE CITY, *October* 15, 1879.

Testimony of Edward Eldridge, farmer, Whatcom, Wash.

The questions to which the following answers are given will be found on sheet facing page 1.

WHATCOM, WASH., *October* 20, 1879.

To the members of the Public Land Commission:

GENTLEMEN: In response to a circular addressed to me submitting a number of questions, under different heads, relative to the disposal of the public lands, answers

to which are requested so far as my experience or knowledge extends, I take pleasure in answering such questions as come within the range of my observation, and also submitting a few ideas for your consideration.

1. Edward Eldridge, Whatcom; a farmer, formerly a sailor.

2. I have lived here twenty-six and one-half years.

3. I acquired title to 320 acres of land under the donation law, one-half to me, one-half to my wife. I have purchased for various persons land by private entry at $1.25 per acre.

5. I will not refer to this, as others more conversant with it will answer better than I can.

6. I have observed defects in the practical operation of the land laws, and this neighborhood is suffering from these defects. In this vicinity about 60,000 acres of land is owned by non-residents. The land bordering on about 50 miles of shore line was surveyed at an early day and placed in the market nearly 20 years ago, and was all purchased by speculators during a railroad excitement. A large portion of the land immediately behind this, not being in the market, was squatted on and a pre-emption right proved up, and by the squatters swearing for each other, paying for the land, and then leaving, and to-day not one of those claims out of a dozen shows any signs that any improvement had ever been made; consequently, with the exception of a few front claims occupied by the early settlers under the donation law, you must go back through the woods from 5 to 10 miles before you come to a settler. The suggestions I would offer as a remedy I will give hereafter.

7. The conformation of the lands in this county and all of Western Washington is mountainous, embracing every form given to the surface of the earth, some places being too precipitous for traversing, some gradually sloping, some beautiful table-lands, and some rich valleys and river bottoms. There is a larger percentage of rich agricultural and in this county than in any other in the Territory proportionately to its size; all that is not fit for agriculture is excellent for pasture for one class of animals or another. Coal exists to a large extent in this county and generally throughout Western Washington, and upward of 90 per cent. of the land in this county is timber land.

8. I do not think the character of land could be classified by a general rule, nor yet by geographical divisions, but each local land district could classify their lands from the explorations of the land surveyors.

9 and 10. I will embrace in my ideas at the close of this.

AGRICULTURE.

1. The climate here approximates that of the south of England more than any other; it is more equable than any other portion of this continent, and for a salubrious, genial, healthy atmosphere it is not surpassed by any place on earth; twenty-six years' experience by one who has been in every quarter of the globe proves this to me, but for the benefit of those unacquainted with the motions of winds and ocean currents, and who would feel an interest in knowing where a genial, healthy climate exists, I will give the causes. Water refracts the rays of the sun, the earth absorbs them, hence in the hot season it is much warmer at any given latitude in the middle of a continent than it is in the middle of an ocean at the same latitude. Fresh water freezes quicker than salt water, and snow and ice accumulate on land much more than on the ocean in the same latitude, and keep the temperature of the atmosphere lower in winter on land than it is at sea. Another natural law causes the wind to blow from the west in high latitudes more than from any other quarter; it therefore follows that winds blowing across an ocean carry a warmer volume of air in winter and a cooler volume in summer than winds blowing across a continent. This is the main cause why it is warmer in winter and cooler in summer on the west coast of America and of Europe than it is on the east coast of America and Asia at any given point of latitude above 45°. The ocean currents aid this action of the winds, and although the coast of Europe is favored more by ocean currents than the west coast of America, that is counterbalanced by the monsoons of the Pacific, which greatly favor the west coast of America. On this coast the winds nearly always blow from the south during winter, giving us a mild atmosphere, with copious rains; and in summer the wind blows from the north, bringing with it a cool, healthy, invigorating atmosphere. It is the opposite on the Asiatic coast.

Again, an immense chain of lofty mountains traverses the whole continent of America parallel with and but a short distance from the western coast, against which the winds from each side strike and produce a greater difference between the atmospheres on each side than would be produced by the distance of 1,000 miles toward the interior of a level continent. This causes our genial climate.

The rainfall here is sufficient for all purposes of agriculture. We generally have rain every month in the year except July, August, and September, and sometimes every month. This year it has rained every month.

Our seasons here may be called all the year round. I sow cabbage-seed in September and transplant in March, and not over one winter in ten will the plants need covering during the winter. With the exception of unusual storms, a man can work out of doors all the year round. The average fall of snow for twenty-six winters I will call 6 inches, and lies about a week. One winter we had snow for four months. Two winters I neither saw ice nor snow.

2 to 11, inclusive, is answered by saying that the clouds sufficiently irrigate Western Washington.

12. In Western Washington there is no land but can be used for other purposes than pasturage. It is valuable for timber or some kind of mineral or coal or stone.

13, 14, 15, require no answer.

16. In this section no one relies solely on raising cattle.

17. In this county I do not think there are over 3 head to the square mile.

18. There was no grass in the woods. All the pasture we have has been propagated; but when once started this is the finest pasture land in the world, the grass and clover being green all the year round and the timber affording shelter from storms in winter and from the sun in summer. The cattle spreads the pasture by the seeds passing through them.

19. Very few fence their range.

20. I think it would be a hard matter to raise better beef than we do here.

21. Springs, creeks, and rivers.

22 to 26. I have had but little experience with sheep, and there is not 1,000 head in the county.

27. I will answer fully hereafter.

28. It is almost impossible to find the corners of the surveyed sections, owing to the fires that have swept the woods from time to time, obliterating the marks that were put upon the trees and burning up posts or stakes that may have been put in the ground.

TIMBER.

1. All the land here is timber land, comprising fir, cedar, spruce, maple, alder, and other small varieties.

2. No timber is planted here except orchards—that is, in Western Washington. It is difficult to determine what kind of timber is the best, although, all things considered, fir may be the most valuable. I believe fir continues to grow from 500 to 1,000 years.

3. I would dispose of the public timber lands, as I would all other lands, by lease only. I will give my reasons hereafter.

4. I would certainly classify the different kinds of timber lands. Some of this timber land is the richest kind of soil, and will make the most valuable kind of farms when the timber is cleared off and the stumps out, while other lands would be of no value after the timber is removed unless it should be for the stone or mineral that may be on it. Forty acres of timber land is as much as any one man can change into a farm during his lifetime. No person who settled in Western Washington that I know of has 40 acres under cultivation whose claim consisted of timber land altogether. Our timber lands are the most valuable of all lands, because a family can settle on them with a smaller capital than on any other. The timber furnishes them all their buildings, fencing, fire-wood, and many other things, all of which they would have to purchase if they settled on prairie land.

5. When we clear off the timber unless we cultivate the land in a few years it would be a dense jungle. Alder comes first, and afterward cedar and fir.

6. Regarding forest fires, I presume since whites first settled here more than half of Western Washington has been burnt over, some of it several times. When we have a very dry season it is impossible to keep fires from spreading. A man settles on a piece of rich timber land with the intention of making a farm. The timber is of no value to him except what he needs himself, unless his land borders on the water. His greatest desire is to get rid of the timber as fast as he possibly can. The ground is covered with dense underbrush, consisting of vine, maple, cactus, all kinds of berries, thorns, nettles, weeds, &c., almost impossible to get through. The settler's first work is to clear off the underbrush from a piece of land for a garden, house, &c., and hopes for a dry summer to burn it up. Should a very dry season come his fire is sure to spread. And to tell him he must not burn it you might as well tell him he must not eat his dinner. But of late years fires do not spread so much, 1st, because the seasons are wetter than they were ten and twenty years ago; and, 2d, because most of the dead timber that had been accumulating for ages has been burned, and in its place is a dense growth of young green timber, which keeps the sun's rays from drying the ground, and makes it very difficult for fires to run.

7. In regard to depredations upon the timber, I think there is but one kind that should be stopped or caused to pay—that is, cutting saw-logs for the manufacture of lumber or spars for export. If the government allows the Northern Pacific Railroad

Company to cut all the timber they may need for the construction of their road it would be a caricature upon justice to stop anything else except the two cases I have mentioned.

8. There has been but little timber cut in this county yet, so I can give little information on this head.

9. I consider everything connected with the public lands ought to be under the jurisdiction of United States district land officers.

LODE CLAIMS AND PLACER CLAIMS.

I know but little of these, and therefore won't refer to them; but as the law makes it your duty to recommend in your report to Congress whatever you may deem wise in relation to the best method of disposing of the public lands to actual settlers, and as you have submitted certain questions to me and invited me to give my opinions and reasons therefor, I shall now proceed to do so.

I will first state I am a native of Scotland. I have read much; I have seen a good deal of the world. I know and appreciate the value of the United States form of government, and the sole reason why I take the trouble to write this is in order to contribute, as far as lies in my power, toward the preservation of that form of government, so that others who are to come after me may be able to enjoy the same benefits that I have and am enjoying. They who know no danger fear none. A man who has never felt the pangs of hunger cannot feel for those who do. No one can appreciate the benefits of a good form of government until they have experienced the evils of a bad one. Few native Americans can realize the true value of land or the blessing of having a home of your own.

We talk of disposing—that is, buying and selling—the land, the soil, the earth, as we would a pound of bread or a piece of cloth. Who made the earth, and for what purpose was it made? It was made for the use of the beings who may be on it, but only for their use while they live upon it. The Creator of the earth never designed that one being should have the exclusive control of sufficient of the earth's surface for the comfortable maintenance of a million; nor was it designed that any being should have any authority with the disposal of the soil after he had passed away. Every man who wishes to cultivate the soil has a natural right to the possession of as much of it as will enable him by his own labor to procure the means of existence for himself and for those dependent upon him, and no man has a right to more. This is the law of God. What would policy require the law of man to be in the United States? What has made the United States the most powerful nation on earth in such a short period from its birth as a nation? Was it the intelligence of its people? Not that alone, for the same intelligence can be found in other lands. Was it the form of government established? No; for that form of government could not have existed for a hundred years in any part of Europe in the present condition of man. It was the freedom and boundless extent of the soil. This secured the individual independence of the people; and so long as that independence can be secured a popular or democratic form of government may continue to exist and prosper; but when once a majority of the people are dependent upon others for their daily bread, their independence ceases and a democratic government will commence to decline.

Carlyle wrote truly when he wrote: "Where no government is required save that of the parish constable, as in America with her boundless soil, every man being able to procure labor and recompense for himself, democracy may subsist, but not elsewhere, except briefly, or as a swift transition towards something other and further." So long as an acre of land fit for cultivation is free and open to any one who chooses to go and occupy it, our government may continue to prosper; but whenever that last acre has become private property, our form of government will commence to receive the strain that will test its strength. Why? Land is the true source of power, and the balance of power changes with the balance of property. As the disposal of the soil of any nation rests with the one, the few, or the many, so is the dominion of that nation in the hands of the one, the few, or the many. It has been the tendency in every land for the ownership of the soil to concentrate in the hands of a few; it is so in the United States, but not to the extent that it will when it is beyond the reach of a poor man to become a land owner; and does any intelligent person think for a moment that our form of government could exist if the ownership of the soil approximated to that of England?

Some patriots may say that the American people are too intelligent ever to overturn or abolish the best form of government that ever existed. What will that intelligence teach them? Every sane American who can read will know that his political creed teaches him "that all men are created equal, that they all are endowed with certain rights, and to secure these rights to all is the purpose for which governments are instituted." What is the meaning of the right to life? Does it mean that a man may die of hunger while he is striving with all his energies to obtain the means of existence? Most assuredly not. The earth will produce enough for the comfortable

subsistence of all; but if some have a great excess, others may not have enough. To regulate this is one of the objects for which governments are formed. Now what will be the course likely to be pursued by a mass of people writhing under the pangs of cold and hunger whose political creed teaches them these things, while they see millions of acres of land held by men who have no more just right to them than they have, and which may not be used for the purposes for which they were made, especially when their political creed further teaches them that whenever any government fails to carry out the purposes for which it was formed it is the right of the people to alter or abolish it? Will they quietly continue to suffer and die, or will they exercise their right? Who can doubt what will be their course? Then comes anarchy, to be followed by a government of force, deriving its powers without the consent of the governed. The first step to be taken in endeavoring to prevent the same fate for the American Republic that befell the republic of Rome is to awaken the people of America to a sense of the danger that is rising before them, and once conscious of that fact it might be possible to provide a remedy, and no possible opportunity could arise where such a warning could more appropriately be given than in your report to Congress. If all the public domain is allowed to become private property it would require as terrible a struggle to destroy the owner's right to it as it did to destroy the ownership in man, and yet no man has any more just or natural right to an absolute right of property in the soil than he has to an absolute right of property in his fellow man. Every man has the right to the possession of a portion of the earth so long as he uses it for the purpose for which it was created; but no man has a right to the absolute control of land of which he makes no use. In this Territory there are thousands of acres of land lying idle, owned by persons who purchased it from government for $1.25 per acre, and who would now ask $10 or $12 per acre from any one who wished to use it, thus becoming rich from what Mr. Mill terms the unearned increment of that land. The government that tolerates such a course of action is not securing to all the rights with which their Creator endowed them.

Suppose any one was to say to that government that is so liberally giving away what don't belong to them, You are dealing very liberally with me, giving me 160 acres of land for nothing, but have you ever thought whether my grandchildren and their grandchildren will all be able to get 160 acres each for nothing also? They will have the same right to get it that I have, and rest assured if they don't get it there will be trouble in the house. They won't be bluffed off with the answer that if they wanted land for nothing they should have been born a hundred years ago. They will answer that the soil of America was not made for the exclusive use of those who lived a hundred years ago, but for the general use of all who inhabit it through all ages.

There is no monopoly so oppressive and so destructive of the principle of equality as monopoly of the soil, and the government that fosters and protects it is trampling upon the principles set forth in the Declaration of Independence. To carry out those principles, the soil should be leased in small quantities to every one who wished to cultivate it himself, an appraised value being put upon it at the time he obtained possession. Every tenant should pay a yearly rent for the land, which rent should go into the public treasury: so much into the county treasury where the land is situated, so much to the State, and the residue to the national treasury. This fund would more than suffice to meet all expenses of government. At the expiration of the lease, or at the death of the tenant, the land should be appraised, and, if of more value than when the lease commenced, the amount of the accrued increment or the increased value arising from the acts of the tenant shall be paid to him or his heirs, while the unearned increment, or increased value arising from the acts of others, shall remain with the land, and a higher rate of rent put thereon for the next tenant, the heir of a deceased tenant having the first claim.

If this is too great a change to be carried out at once, a step toward it would be made by the passage of a law prohibiting any individual from owning more than a certain number of acres of land; and if the government is not ready to do that, in the name of humanity don't let the residue of the public lands be a bait for greedy speculators; let no one get more than 160 acres, and let no one get any who owns 160 acres; 160 acres is more than enough for any family if the land is fit for cultivation.

The world is beginning to open its eyes to the land question. In most countries where civilization exists the land is completely owned by a small fraction of the population, and the governments of these countries have to be sustained by large armies of men. Not one of them could exist solely from the consent of the governed. Many able men are advocating a modification of the land laws, but they all approach the subject in a very delicate manner, well knowing the power they have to contend with. But this is the country where the problem of the ownership of the soil should be solved, for this is the only country that acknowledges it to be the duty of government to secure all persons in the possession of the rights with which their Creator endowed them, and the sooner the attempt is made the easier it will be to carry it out.

It would require volumes to treat this matter as its importance requires, and I have not the time to spare to enter upon a work that may not be favorably received; but I

could not, consistent with my sense of duty as a citizen, allow this opportunity to pass of presenting my opinions upon a question of so vital importance to humanity at large. It is not among mass meetings of discontented and riotous men that these questions should be agitated, but it is in the legislative halls and before such commissions as yours, where a remedy can be peacefully applied, that these matters should be ably and fully and impartially discussed. The time is fast approaching when our political creed will have to be changed, or else the principles contained therein will have to be faithfully carried out.

I am, respectfully, your obedient servant,

EDWARD ELDRIDGE.

Testimony of Elwood Evans, attorney-at-law, Pierce County, Washington Territory.

The questions to which the following answers are given will be found on sheet facing page 1.

Answers to certain questions submitted by the Public Land Commission.

1. Elwood Evans, New Tacoma, Pierce County, Washington Territory; attorney-at-law.

2. Have lived in Washington Territory ever since it was established as such, having come to this section while it was Oregon (November 10, 1851); lived at Olympia, the capital, till December 1, 1878, since which time have made New Tacoma my residence.

3. Have never been able to believe that I could *bona-fide* avail myself of the privileges of either donation, pre-emption, or homestead laws under their *true intent* while I had no real design to become an agriculturist, and was in the practice of my profession, which I could not abandon, compelled to reside in some town.

4. Have had considerable practice in the Territorial land offices; have made the donation, pre-emption, homestead, and coal laws a matter of study and especial attention.

5. During the whole history of the Territory our land officers have, with a true spirit of accommodation, advised settlers and claimants of the public lands as to the *modus operandi* of acquiring titles. I think (and I believe it is rather jealousy of what is due to my profession than selfish, but it is honestly believed, whatever the stimulus) that the services of attorneys have been thus rendered unnecessary by this too liberal custom, when their employment would have been advantageous, even economical, for all concerned. It is my opinion, based on a long experience, that practice in the land office should assimilate to the mode of conducting business in courts; that persons having business in the land office should be required to make their own showing, just as pleadings, petitions, motions, &c., are prepared, preliminary to the hearing in other courts. A register should no more prepare papers which constitute the application he is to grant or deny than a judge should a motion for continuance or new trial. Conversely, the land officers should decide matters presented for their action, not advise how a case shall be presented. Such a system imposes labor on the officer for which he is not compensated. It may be possible to some extent to compromise him. Much of the duty of the register and receiver may be of a judicial nature. Clerical or ministerial duties prescribed by law are not here referred to. I cannot recall a single instance in twenty-five years' practice where there has been just occasion to complain of unreasonable delay or expense to settlers in securing titles to their claims. Let me qualify this. From the practice which has been adopted I think there has been unnecessary expense entailed, but for this the local office is entirely blameless. Nor do I know, under the law as it now is, that any one is censurable. In contests before the register and receiver those officers, instead of being judges, as they really are and should be, are *pro tanto* reduced to mere commissioners for the taking of testimony to be certified up to the General Land Office. Every statement that is offered has to be received and reduced to writing. Every question that is asked, relevant or not, objected to or not, must be taken down. A voluminous record is made, often useless, expensive, and eminently unsatisfactory. Of course cases may arise when the hearing by those officers is merely preliminary to presenting it to the department, in which case such a course becomes necessary. But in most cases it would be the wiser plan to have the cause tried upon its merits by the local office. The decision presenting the facts, the affidavits necessarily showing the basis of claim or right, the evidence corroborating or rebutting, and the exceptions of an aggrieved party would be all-sufficient to secure substantial justice.

In my opinion, subject to the right of exception to their ruling, the officers should be fully empowered to decide the relevancy and materiality of testimony and witnesses, to exclude irrelevant testimony, forbid cumulative testimony, and limit the number of witnesses on any particular fact; in short, to try a contest as a judge tries a cause without the intervention of a jury, saving to parties litigant their right by bill of excep-

tions to save the testimony they desire saved for purposes of review. This would greatly abridge the labor of the officers, the time of the trial, the record, and in every way be a reform. The register and receiver should be a court or tribunal whose judgments should be *nisi* continuing with the effect of absolute settlement until reversed on appeal or review, and becoming absolute if not appealed from within a certain time. An unappealed judgment of the local office should be confirmed by the Commissioner, as of course. The register and receiver for these judicial functions should be paid a salary. If the parties to the controversy desire the testimony taken to be certified up with the case let them secure it as it is done in court. A register and receiver acting as judges should not have their attention diverted as mere clerks. The settlement of a controversy, if not appealed, by the local office where the parties, witnesses, &c., are better known has so many advantages comment is unnecessary. It is unjust to leave everything in abeyance till affirmed by the Commissioner or the Secretary of the Interior after months or even years of delay. The decisions of the land officers in this Territory have always been commendably prompt. The delay which has occurred, as a rule, has been between the time of the action by the local officers and the affirmance or rejection by the General Land Office. This would not occur if unappealed cases did not require re-examination. The accustomed long interval between certifying for patent and issuing patent has been a cause of sore annoyance and real grievance in many instances. It is needless to more than refer to such a condition of things to expose its hardship and injustice. A settler for years is left in doubt as to the validity of his title, the regularity of the proceedings. The patent is withheld, he knows not why. His title is questioned, he cannot explain. He cannot call his own and fully enjoy that which he has earned and rightfully should possess.

6. Our land laws are very liberal and beneficent. I favor the homestead principle which secures homes and *per se* shows good faith. The government may not be prepared to dedicate all agricultural land subject to its right of eminent domain to homestead purposes. If it is I would make that law the uniform system of settlers' securing agricultural lands. If the pre-emption law is adhered to it should be administered strictly to defeat its being used for the mere purpose of acquiring lands from the government. To the actual settler who makes *bona fide* improvements, and by the character of those improvements he exhibits *bona fides*, I would give the amplest opportunity and most liberal terms to secure the title. The land offices should be clothed with a fuller discretion to consider the equities which may present themselves in a case. It is impossible for a Commissioner, however able and thoroughly informed, to anticipate what may arise in a case in a country like this, or to fix a rule upon which a positive instruction is given to the local offices, which subjects an honest settler to great hardships and sometimes deprives him of his land—not from any fault of the settler, but because the rule is really too impracticable to be literally carried out. If a party places himself within the spirit of the law and of the rule, and shows why he has not complied, there are cases when he is as much entitled to affirmative relief as though literally executing both law and instruction. It is equally plain that some settlers exhibit truer *bona fides* in the expenditure of their all, though that is but a few dollars, who give all their labor they can spare, for they have a duty to those dependent upon them which may compel them to labor elsewhere than others more fortunate who exhibit on final proof the results of hired labor to the amount of thousands. This needs no elaboration. On the 14th of March, 1871, Honorable Daniel D. Pratt, then United States Senator, delivered a speech in the Senate on the "rights of settlers upon public lands," which I take pleasure in referring to as expressing views more ably and perspicuously than I could hope to, were it proper for me to obtrude them in this paper.

7. Pardon me for inclosing the "centennial address on this Territory, delivered at Philadelphia, in 1876." It supplies as definitely as I can, with my limited time, the data sought by this question. I also inclose a portion of an address on timber, recently delivered at the annual fair of the King County Industrial Association. While I have matured no system, I am clearly of opinion that the time has fully arrived for making a minute and detailed survey of the timber regions of the States and Territories with as much care, precision, and method as is adopted in taking the census, and also for the adoption of some rigid system to reserve, protect, defend, and render remunerative and useful this invaluable resource to any region in which timber may be found.

8, 9, and 10. Principally answering the latter, but incidentally having 8 and 9 in mind. I have already referred to Ex-Senator Pratt's able speech on the philosophy and animus of our land system. His bill (S. No. 10 of that session) on page 3 of said speech is an admirable nucleus, about which may be constructed a perfected system of homestead and pre-emption rights, to which modes of acquiring land agricultural lands should be restricted. The avenue for absorbing the public domain other than in the legitimate uses of actual settlement should be rigidly closed. The time seems to have arrived to begin to save the land for the needs of settlement, to the exclusive appropriation for homes. To the actual settler, in commuting a homestead or paying for a pre-emption, I would allow the privilege of using any scrip, warrant, or other

government pledge for payment of its indebtedness, in securing his title. I speak of the actual settler—to him I would extend every facility. While the pre-emption law exists, under which men may be hired to secure a tract of the public lands in a brief period, the *bona fides* should be ascertained by every test; and when ascertained, the honest pre-emptor should be placed on the same footing as the homestead settler. It is the principle or intent of the Pratt bill that I commend. I believe the words "actual settlement" should be guarded by restraining language, *e. g.*, by adding after settlement "for the exclusive purposes of cultivation or agriculture," the idea being limited to appropriating agricultural lands to "the making of homes." To effectuate this principle divide lands into classes, viz, agricultural, timber, coal, and mineral, the lands open to settlement by homestead being confined to the agricultural class.

If the idea be adopted that the public lands (agricultural lands of course are here meant) are held in trust for those who are willing to appropriate a quarter section and make it a home, I would adhere to an uniform homestead system. If not, I would at once ingraft the principle on the land system, "That any man who has enjoyed the right under the homestead, pre-emption, or timber-culture act shall not make a claim under either of the other laws." He should be limited to the enjoyment of one right only; but an abandonment to government under either law for good cause shown, not compensated in any way by private party by purchase of improvements or for relinquishment should authorize the enjoyment of one grant, before exhaustion of right. In other words, "The settler should rather secure the privilege to perfect one grant, rather than one filing," provided always he has not relinquished the right acquired by a filing on a good or valuable consideration or inducement. Let me illustrate. A case has just occurred within my knowledge. In June last A took a homestead claim upon Vashon's Island, which, of course, necessitated the rowing of a boat between his said claim and the market for his produce, or where he obtained supplies. When he filed, it was understood between himself and a brother that the latter would take an adjoining claim. The brother found an eligible location on the mainland. A has a crippled left hand, has lost two fingers of the left hand, and the two others are stiff-jointed, so that he can pull but one oar, and therefore cannot alone row a boat. To make a living under such circumstances upon the island is impossible, for he cannot get back and forth, nor bring his produce to market. To add to his misfortunes, A's wife being advanced in pregnancy, in July a neighbor's wife died in child-bed, the death being attributed by Mrs. A to the inability to communicate with the mainland and secure proper professional aid. She left to go to the house of a relative, and the death of her neighbor so impressed her that she cannot be persuaded to return to her husband's claim upon the island. He is forced to abandon such claim. He cannot live upon it. He has paid $23 to the government, spent over three months' labor, and about all his money he brought with him, after paying his expenses to reach the country. He cannot take another homestead, although it will be conceded by all that he should be so allowed. He can now take under the pre-emption law. From this illustration, I desire to say: Let the party elect under which law he will hold, if the several systems are retained. Let him mature one right without he sells or disposes of his settlement for a valuable consideration or upon inducement of any kind; in other words, not a compulsory relinquishment. If he files and sells, his right is exhausted. If he files and for meritorious reasons without fault of his own he is compelled to relinquish to the government, let him file again, if he brings himself within the rule entitling himself to relief.

If the question be settled that the government can safely look to the timber, mineral and coal lands for its revenue, and open the agricultural lands for homestead, may I suggest I believe abundance will be derived from a proper system of sales of the former—either the timber itself or timber lands, and cash entry for mineral or coal lands. It ought to be the policy to invite capital to buy directly from the government at a proper valuation rather than force capitalists to employ intermediate parties to make pretense of entering such lands who have neither means nor intention to develop mines. The government is defrauded; parties are tempted to commit perjury, and the government besides really loses the value of the investment. All capitalists desire is assured title, speedily confirmed to them. They would pay more for a tract patented at once to the government by two-fold than they often give to these intervening squatters who swear away the United States title. Thus under the pre sent system perjury and fraud are invited, and others instead of the government realize the value of such lands. For example, if a coal company is willing to pay A $5,000 for 160 acres of coal land for which A paid the government $2,400, is there any sense in the government absolutely tempting A to commit perjury and to defraud it out of the $2,600 which the capitalists would have paid the government quite as willingly if they could have purchased? Coal or mineral lands should be rated by a sworn and competent commissioner. One mine or vein may be worth thousands while the other is not worth hundreds. Private enterprise sells articles at their true value; all horses are not sold at the same figure. Private parties, railroad companies, realize upon lands according to their proportionate or true value. Lands worth $100 per acre are not sold at the same price as lands that are worthless. Why should not the government,

when it has property to sell, do business on business principles? It would be but a trifling extra expense when timber lands, coal lands, or mineral lands are inspected and surveyed to grade them at what they are relatively worth, taking into consideration the extent of supply, quality of article, accessibility, &c., governing the affixing of value. Lands containing beds of true coal should command a much higher price than land containing veins of lignite—both are called coal lands. Is not such a truer test than proximity to a railroad? There are sections where a mine two or three miles from a railroad would cost more to be rendered accessible than other locations where the building of a railroad of twenty miles might be required to get a railroad or an outlet, and the latter could be built at less actual cost. If the government can hope to realize from its coal, mineral, and timber wealth, sold on a plan as herein suggested, I am in favor of saving agricultural lands exclusively for homesteading by actual settlement. Five years of actual residence and cultivation is evidence of *bona-fides*, and should earn the land. I am not sufficiently well-informed as to the proportion of the public domain respectively classed as timber, mineral, or coal. If it is as great as I have reason to believe, I favor an uniform homestead system. Abolish the pre-emption law; abolish every invention for divesting the government of its title, that unsettles the mind of a party who is willing to convert virgin land into homes and tempts him to be a speculator or a land proprietor rather than a settler.

In the settlement of controversies between claimants in the trial of contests, in fact in the awarding of a certificate of being entitled to patent, the register and receiver should be clothed with power to act judicially; clothed with jurisdiction, with power to issue the necessary process, summon and compel the attendance of witnesses, grant continuance, punish contempts, and adjust the payment of costs. A transcript of such judgment of costs should be authorized to be filed in a district court, and a rule to show cause, or some similar proceeding, become vitalized into a judgment whereby the aggrieved party could recover by execution. These judgments should be *nisi* for thirty or sixty days, within which, if no appeal was taken, they should become absolute as to the claim or right of the party against whom rendered. He has had his day and is concluded. If appealed from or exceptions taken within that time they would go up to the General Land Office for further action of the department. If not, they would be returned as papers sent forward for patent. In contested cases, if unappealed, I would have them affirmed, of course. The right of an action at law, or to maintain a suit in equity to cancel a patent obtained through fraud or misrepresentation, is not affected. The jurisdiction of the Land Department would of course be restricted to the question of surrender of the United States title to respective claimants. The nearer you can make the decision of the local office final, until reversed on appeal or exception, the wiser the policy. It would lead to more thorough trial, make less costs, frequently put questions at rest, and in many ways prove beneficial.

AGRICULTURE.

1. In addition to the references to climate in the said centennial address, I send a valuable and reliable extract which answers this question as to Washington west of the Cascade Mountains. In this Territory, and certainly in Western Washington, although there may be exceptional seasons, there is abundance of rain and water for purposes of irrigation.

2. The tables and statistics in the documents referred to answer this question as definitely as I am able with the data at hand.

3. All that is cultivable at all; of course I have no reference to the heavy timber lands.

4, 5, 6, 7, 8, 9, 10. In this region I know of no real attempt to supply a system of irrigation, indeed I have not heard of such a necessity. We have a law (which I inclose) for the construction of ditches, but that is for the purpose of drainage; true it serves both purposes, though really designed for the reclamation of swamp land.

11. I know of one or two suits as to water or riparian rights, or torts growing out of the diversion of streams, but no questions have arisen which really bear upon the subject upon which this query seeks information.

12. In this particular locality, the prairies of Pierce and Thurstin Counties, gravelly and devoid of soil, there are large areas of land fit only for pasturage and hardly for that. They are appropriated usually for sheep, though other stock to a limited number range over them. I see no good reason for inducements to settlers to homestead this land, or to acquire quantities of it as pastoral land. The more they paid taxes on the poorer they would be; some of it would require two acres for each sheep.

14. I do not believe it policy to put the agricultural lands in this Territory, or in any Territory for that matter, in market. I have given my reasons for believing that the government should reserve its agricultural lands for homes for actual settlers.

18. I think the growth of grass is increasing largely, that the prairie lands are improving because for years used as cattle ranges by which they have been manured, and that the burned timber openings are greatly multiplying forage for stock.

19. Cattle raisers as a rule do not fence. From the mildness of our winter, as the rule cattle and stock take care of themselves.

I have not investigated sufficiently to give any accurate information as to the remainder of the matters queried after under this head.

TIMBER.

1 and 2. To the two addresses inclosed I refer for general answers to these questions. I cannot reply accurately or in detail. A timber survey is required.

3. It is generally conceded that if our heavily timbered lands are denuded of their timber they will have become entirely valueless, not needed or available for purposes of agriculture. If this be true then the timber is the sole element of value. A tree suitable for lumber should bring more than one utilized for fuel, fencing, railroad ties, &c. Saw-logs command more than fire-wood. Therefore a system or tariff of stumpage could and should be arranged which would make our forest lands a source of revenue, and of necessity bring them under the immediate supervision of proper officers, and the terrible waste and destruction now going on would be in great measure checked if not entirely stayed. Lease with power to remove is only license to despoil. Sale, of land gives absolute right for the vendee to cut down, burn up and destroy not only what is upon the tract sold, but affords the opportunity to set the match which consume millions of timber and destroy whole areas of timber country. The saw-logs may be sold first; after they have been taken the remaining small timber may be sold for cord-wood, ties, or other purposes. The sale should always be with the prohibition to use anything but an ax to fell a tree. Such a plan adopted would bring revenue to the government; it would save timber land for the present and future generations.

5. There is a vigorous and speedy growth. But the very speedy growth impairs the value of the timber for lumber manufacture. Our forest timber derives its value from its compactness, toughness, density; its long maturing in centuries. The second-growth for a generation only is admirable for fuel, serves for fencing and many purposes; but is valueless when compared to the old settler of thousands of years.

6. Forest fires arise from several causes. (1.) The reckless use of fire in the felling of trees, to peel its bark or saw it up for fire-wood. (2.) The burning after a clearing without care. (3.) Occasionally from a camp-fire. In our dry seasons, in one extensive forest fire, more timber is destroyed, more timber land devastated by scorching, deadening, and blackening the trees than is absolutely utilized. Prevention of the causes of fires as before suggested, creating the belief that the timber has a value, will do much to check this great evil. But if the fire starts, bountiful heaven, sending heavy rains, affords the only remedy.

7. Our saw-mills indirectly have been the inducement for removing the timber from the public lands. The large companies own vast areas of timber land throughout Western Washington, bought at $1.25 per acre when currency was worth 40 cents on the dollar; at which time lands happened to be subject to cash entry. These companies teach the government its duty. They have kept these forests in their virgin condition. The logger's ax has not invaded their extended domain. In the mean time, for twenty years their own lands not trespassed upon except by fires, they have bought from loggers the timber which has been converted into the immense lumber manufacture of Puget Sound. Depredation from any other cause has been so trifling that it is unworthy of mention. The legislation necessary is for the government to assert its possessory right and guard what is left, and save the proceeds in the same manner similar to the one herein suggested.

8. The local custom is the establishment of logging camps in the heart of a densely-supplied timber section, staying there till every stick worth cutting down is converted into saw-logs. Sometimes camps are established and run by one of the large mills. Oftener, however, a logging camp is a private enterprise. Large booms of logs are collected, frequently as much as a million of feet in a single raft, and from two to three or four of these rafts are sent away from our logging camps in a year. These rafts are sold to the mills; the mill owners purchasing sending a steam-tug to tow them to the mill at which they are to be manufactured into lumber. Trespass upon government lands, or from lands belonging to the logger, or from tracts which the logger has purchased that standing timber, are the several ways that the right to cut timber is exercised or acquired. I have frequently drawn conveyances of the standing timber, together with a right of occupancy for a fixed term to cut and remove it. Sometimes the sale is unqualified, sometimes restricted to trees over a certain dimension. Sometimes the cedar is excepted. I state this thus perspicuously because it suggests business for a timber agent; it demonstrates that all the growing timber has a value which can be measured. I have known sales of the timber on a quarter section to be as high as $600, payable $1 out of the proceeds sale of rafts for every thousand sold to the mills. Is there any good reason why the government should not profit by this timber?

9. If as in the present case at Olympia, and for what I know at Vancouver (my

business with both offices has always been most satisfactory), I answer—yes! But as "whatever is worth doing at all is worth doing well," the protection of the rights of the government in the timber of Puget Sound would justify the employment of officers for that special purpose. I would confer this appointment upon the local land office; giving also the authority to them to use a proper detective force—the inspector to rate the timber, make sales and collections, reporting to such officers and subject to their supervision and direction. Were the land office clothed with jurisdiction, *i. e.*, as a court of first instance to adjust and determine complaints of depredations of timber it would prove a salutary system. I have often inquired in my own mind, what right has any one to seize timber without due process of law? By what authority are rafts exposed to sale without condemnation? It has always been the plan when seizures have been made to buy the rafts at the price they would allow them to bring rather than contend with the government as to the trespass by that officer acting in its name, but without warrant. Give to these land officers when acting as judges the inseparable incidents of "jurisdiction," and turn over this matter to their control. They possess the records enabling profitable sales of timber; they should be invested with the power to guard the timber land and secure the government against trespass and waste.

Testimony of E. C. Ferguson, Snohomist County, Washington.

The questions to which the following answers are given, will be found on sheet facing page 1.

SNOHOMIST CITY, WASHINGTON, *October* 10, 1879.

Public Land Commission, Washington, D. C.:

GENTLEMEN: Having received your circular of interrogations, &c., I submit the following answers:

1. E. C. Ferguson, Snowhomist, Snowhomist County, Washington.
2. Nineteen years in the county; twenty-one years in the Territory.
3. Have acquired title to public lands under the pre-emption and homestead acts.
4. Have had considerable business with local land office in making applications for parties under the pre-emption and homestead acts, taking testimony of witnesses on final proof, &c.
5. On pre-emption (uncontested), except time of residence required by law (not less than six months and within thirty months), on filing declaratory statement; fees at land office, $3; if made here, one to two dollars to party who does the business; on final proof, $4 fees at land office; actual expense of pre-emptor to Olympia and back, $15; testimony of witnesses, if taken here, $3; if witnesses go to Olympia, same as pre-emptor; time necessary to make the trip to Olympia and back, five to six days. On homesteads, same, with the addition of the larger fees. Contested cases—cannot say.
6. Do not see the propriety of not allowing a party to file a second pre-emption declaratory statement when he has failed to make proof and payment on his first filing. Think it should also be allowed in homestead entry, for it often happens, in this part of the country, that a poor man takes up a claim and lives on it two years or more, and then, in case of pre-emption, has not the means to pay for the land, but if allowed to sell his improvements to some party and make another filing, the party purchasing would immediately file upon the land and the party selling would have something with which to commence upon another claim.
7. This county is principally a timber county. About the mouths of the rivers are some tide marshes which have to be diked to render them fit for cultivation. A very limited amount of prairie probably not to exceed a thousand acres in the whole county. This is a great county for grass, also for grain. The greater portion of the land is covered with fir timber suitable for lumber, the bottom lands along the streams are covered with spruce, cedar, maple, alder, cottonwood, vine, maple, &c., occasionally fir grows on the bottom lands. While the land is principally covered with timber, the soil is good, and when the timber is removed the land produces well grass, grain, fruits, and vegetables. The soil is A 1.
8. I think by general rule.
9. Do not know of any better system then the present.
10. Do not know of any better way than by pre-emption and homestead entry.

AGRICULTURE.

1. Climate mild; plenty of rain; fair length of seasons generally, but light fall of snow in winter. No irrigation needed. No frost here yet at this writing.
2. Rain from September to May generally, sometimes later in the fall; usually have

some rain up to 1st of July. I have never known the crops to suffer for want of rain; sometimes have a little too much.

3. No irrigation needed.

5. None.

6. Not wanted.

12. None, except such as are only partially cleared.

13. Not in this county.

14. No.

15. One acre. Am acquainted with some sections not so good. I think there are but few better.

16. Question rather vague; say 5 cows.

17. Cannot say. Country sparsely settled. And where settled not one-eighth of the land cleared up. Say, where a settler has 20 acres cleared, will average 10 head of cattle.

18. Increased.

19. No cattle raisers as a business.

21. Springs and streams from the mountains.

22. Say five.

23. No regular sheep pastures; only a few in the county.

27. None.

28. Yes; in many instances corners cannot be found.

TIMBER.

1. Mostly timber nplands, red, yellow, and white fir, cedar, hemlock, &c.; bottoms, spruce, cottonwood, maple, alder, cedar, and vine. Red and yellow fir and cedar used for lumber. Balance of timber not much used, yet some maple, alder, and spruce are used in the manufacture of furniture, also cottonwood for staves. Spruce is also manufactured into lumber.

2. None planted.

3. Think the lands should be disposed of only to actual settlers under the pre-emption and homestead laws; 160 acres, as at present. Do not think actual settlers should be limited to one filing only where they do not make proof and payment, because a party may make an entry in good faith and make valuable improvements thereon, but before he is ready to make final proof he may have a chance to sell his improvements to a party who has means to purchase but who does not desire to go further back and take up lands entirely unimproved. The first party, being acquainted with the country, will go further back and perhaps locate a better place than the one sold. I know of many instances of this kind, except where the party had first filed a pre-emption his next entry would have to be a homestead, and *vice versa*. As to the timber act of June 3, 1878, think it rather vague; do not think there is any portion of this county (except some of the mountainous part) that it ought to apply to, but I notice there are a large number of entries already made under the act. If parties are allowed to acquire title under this act our county (or the best part of it) will soon be in the hands of capitalists, and consequently the settlement of the county very much retarded. I think that form No. 2, "Testimony of witnesses" (under timber act), should be more explicit; say, after question 7 should be questions as to the nature and quality of the soil, its adaptation for cultivation when the timber is removed, &c., as it is a fact that much of our land is covered with desirable timber, and that its chief (or greatest) value at this time is the timber, and that the land is more valuable for agriculture after the timber is removed. Yet if capitalists are allowed to get hold of it in quantities (as they will if it can be located under the timber act), it may be a long time before the timber is removed and the land get into the hands of farmers; but if it can only be acquired under the pre-emption and homestead laws there will be a much greater settlement and improvement, and the actual settler will get the benefit of the timber, which will enable him to make greater improvements.

4. No.

5. There is a second growth of timber where it is not kept down by the settler; the same kind as originally stood on the ground. Think it would take at least 50 years for fir timber to acquire a size suitable for lumber.

6. Forest fires do not do much damage in this part of the country. Forest fires are principally confined to gravel ridges; these ridges extend along and near the sound shores, but in some portions of the Territory extend inland, although the indications are that at a time long ago a fire swept over a great portion of the country; also, at a later period, say within the last one hundred years, a fire swept over quite an extent of country in this county. So far as my observation goes, fires have been started by Indians generally. I have noticed that after a hard winter we have the most fires, and particularly so if the following summer is dry, which is generally the case when we have a winter with much snow. The timber being evergreen, the weight of the snow on the branches causes them to break and fall to the ground; in this way the ground

gets thickly covered with the branches, which dry out in the summer and furnish fuel for the fires. The fires, once well started, they run up the dry bark on the fir trees, and if the wind is blowing spread very rapidly. But outside of gravelly ridges there is generally so great a growth of underbrush and the forest so dense that it does not get dry enough for a fire to run. Nothing as to mode of prevention.

7 and 8. There has been a great deal of what we call timber stealing, that is, cutting timber on the public domain for saw-logs, &c. This timber is cut by parties in the logging business and sold to the mill companies on the sound, and by them manufactured into lumber, but the government is now taking steps to stop it, and from present indications, I think, with success.

9. Think they would with proper limits, &c.

As to mining, I have nothing to say; my experience is limited.

In speaking of the lands in this county, &c., I wish to be understood as to those portions on which there are settlements or liable to be. Now, our county on the east is bounded by the summit of the Cascades; as a matter of course, there is a portion of mountainous country, none of which is yet surveyed and probably will not be for some time to come; neither will it pay for some time to come to remove the timber from the mountain sides. As to the mountainous portion of the county, I make no answers or suggestions, but I think all laws in relation to the public domain should be so guarded if possible as to prevent capitalists from acquiring title to large tracts.

Respectfully,

E. C. FERGUSON.

Testimony of John R. Goulter, county auditor and farmer, Oysterville, Wash.

The questions to which the following answers are given will be found on sheet facing page 1.

1. John R. Goulter, Oysterville, Wash.; county auditor and farmer.
2. Thirteen years.
3. Yes. I have bought some offered lands.
4. By being clerk of district court, and making out land papers for homestead and pre-emption settlers.
5. I never noticed any unreasonable delay.
6. I think timber lands ought to be offered at intervals, in limited quantities, to the highest bidder by sale or lease.
7. Agricultural and timber.
8. By a competent judge designating the different sections is the only sure way.
9. I do not understand the exact meaning of this question.
10. I think there is less jobbery and crooked ways by the homestead and pre-emption system than any other way I know of.

AGRICULTURE.

1. Mild climate and lots of rain in winter.
12. Very little.
15. Twenty, if they run on the natural range, without cutting any hay.
16. Fifty.
17. Very few.
18. Increased.
19. Some are fenced and some not.
20. Doubtful.
21. The clouds give plenty.
22. Five.
23. Neither, so far as I see.
24. Sheep eat too close for cattle.
25. The sheep take the dry and cattle the tide and marsh lands here.
26. About 2,500.
27. We want more land surveyed and the ten-mile floating grant of the North Pacific Railroad Company settled one way or the other.
28. Not but what might be reasonably expected.

TIMBER.

1. Nine-tenths spruce, hemlock, fir, cedar.
2. Plenty growing.
3. Leased or sold to the highest bidder in limited quantities, whenever needed for current consumption by the mills, but not sell any large quantity ahead of the requirements of the mill to create a monopoly.

4. No.
5. Yes; principally alder, the second growth.
6. A fool and a lucifer match; they have ruined millions of feet here; enlightening public opinion,
7. Execute the present laws.
8. Individuals cut and sell to mills.
9. I think they would.
I know nothing of mining.

Testimony of W. H. Smallwood, register, and S. W. Brown, receiver, United States land office, Vancouver, Wash.

The questions to which the following answers are given will be found on sheet facing page 1.

UNITED STATES LAND OFFICE,
Vancouver, Wash., November 19, 1879.

Public Land Commission, Washington, D. C.:

GENTLEMEN: In reply to your circular in relation to public lands we have the honor to state that the copies sent by you have been referred to such persons in various portions of Vancouver land district as, in our judgment, are best qualified to answer intelligently the questions propounded by your Commission. As register and receiver of this district we deem the subject of your deliberations of sufficient importance to require from us a special report.

PRE-EMPTIONS.

1. As to pre-emptions, we would recommend that the pre-emption law, if retained upon the statute-book, be so amended as to prescribe, first, a definite amount or length of residence; and second, a somewhat more definite amount and character of cultivation and improvement; third, we would also recommend that the price of pre-emption lands within railroad limits be reduced to $1.25 per acre.

HOMESTEADS.

2. As to homesteads, we would recommend that the homestead law be so amended that the mere act of entry may not exhaust the homestead right. We believe the rule in force on this subject is too rigid, and, in very many cases, works a great hardship to poor men. On this subject the opinion of Assistant Attorney-General Smith, in case of Bernard C. Killin, very well expresses our views. (See Copp's Land Laws, edition of 1875, p. 241.)

There is to-day a large class of persons in this country who, through ignorance or misfortune, have, under the rule now in force, forfeited the homestead right without being able to obtain a home. By a somewhat more liberal provision these men, the large majority of whom have acted in good faith toward the government, would be provided with homes, and the country would at the same time increase its power of agricultural development and add to the number of its industrious and patriotic citizens.

We would also recommend that the homestead act be so amended as to reduce the amount of fees and commissions required to be paid by the settler. It costs a poor man too much to take a homestead under the present law. At the same time the most rigid requirements should be enforced as to residence and cultivation.

We would further recommend that in cases of cancellation of homesteads, on proof of abandonment, some provision be made to protect the equitable rights of the party filing the complaint. The rules of practice require the party who initiates proceedings of this character to deposit a sufficient sum of money to defray all expenses incident to proof of abandonment; and yet he has no assurance that some one else, more "diligent" and better suited to watch the result, will not, at the very moment of cancellation, step in and make entry of the tract so canceled with a soldier's additional homestead right before he can possibly have an opportunity to know that the tract is vacant. Two or three cases of this kind have come under our observation, where the local officers were powerless to enforce a remedy in the interest of justice.

TIMBER-CULTURE ENTRIES.

3. We would recommend that this act be so amended as to specify distinctly whether residence is required of the claimant. The present law appears to be silent upon that subject; and with many the question of residence seems to be an open one. If the

requirements of the present law are strictly complied with we see no reason why a residence should be necessary. The evident object of the law is to promote the growth of timber on the prairie lands.

TIMBER DEPREDATIONS.

4. The greatest source of annoyance to the local land officers is found in the subject of timber depredations. We would recommend that this matter be placed entirely in the hands of special agents of the General Land Office. It is impossible to enforce the law against offenders unless the prosecuting officer can be personally present where the offense has been committed. This the register or receiver cannot do and at the same time attend to the primary duties of their offices.

PUBLIC SURVEYS.

5. We feel it to be our duty to call attention to the fact that on extending the public surveys discrimination appears to have been made hitherto against the most heavily timbered portions of this country. The rates of surveys should be so fixed that contractors will not prefer to do their work upon uninhabited prairies, while settlers upon timbered lands are required to wait for five, ten, or fifteen years (in one case, we are informed, seventeen years) for the survey of their lands before being permitted to make homestead entry, and then five years more before being allowed to make final proof. Certainly the prospect of such an experience will not do much to encourage settlement and agricultural development. In some cases there have been three or four surveys (during several years) of a township, each one finding settlers upon land which by a prior survey had been designated on the plat as "mountainous," "heavily timbered," "unfit for settlement and cultivation," &c.

LAND UNFIT FOR CULTIVATION OR FOR TIMBER.

6. We desire to call to notice the fact that a considerable portion of land along the banks of the Columbia River is destitute of valuable timber or mineral, unfit for cultivation, and at the same time valuable for fishing and commercial purposes. The settlers upon these lands are unable to enter them either as town sites or with such scrip as may be made available. Yet in many cases they have improved the lands by building houses, docks, &c., and have resided there in good faith for years, hoping some day to obtain in some way a title to the only homes they have in the world. In some cases it can be shown by competent testimony that upon certain tracts of this kind not one-half an acre can be found which can be cultivated. In one case it appears in evidence that a pre-emption claimant had carried soil from another tract in order to make a little garden on his claim (the entire surface of his claim being rock) to enable him to make final proof; yet in consequence of instructions from the General Land Office in a somewhat similar case, the local officers felt it to be their duty to disapprove of the proof offered, and therefore could not allow his final entry.

Some remedy ought, in justice, to be found for these settlers; though some of them have already abandoned their claims, having concluded that it would be impossible to make final proof without being able to show a reasonable amount of cultivation. (See Commissioner's letter of February 6, 1877, in case of Edward Miller, pre-emption, cash entry No. 1797, and John B. Nice, pre-emption, cash entry No. 1798.) In case of Edward Miller supplemental proof was submitted, showing that there was less than one acre fit for agricultural purposes on the entire tract. Yet pre-emptions being granted for agricultural purposes, the Commissioner of the General Land Office must necessarily hold as he does: that the amount of cultivation is insufficient under the law.

COMPENSATION OF REGISTER AND RECEIVER.

In recommending a reduction of homestead fees and commissions we would not be understood to favor a reduction of the aggregate compensation now provided for the register and receiver. Their duties and responsibilities are important and numerous; and in districts where the salary and commissions fall somewhat below the maximum standard the compensation is not in equitable proportion to that of officers who somewhat exceed the maximum.

The chief labor of a district land office consists not in the number of entries, but in its location with reference to the traveling and inquiring public. Some provision should be made to pay the register and receiver for the immense amount of correspondence imposed upon them, and the many annoyances to which they are constantly exposed by personal inquiries from those seeking information as to vacant public lands and the operation of the various laws in relation thereto. A considerable amount of additional labor has also been the result of the law allowing final proofs to be made

and entries applied for through certain officers of the county in which the land is situated. More than half the cases received through the mails from this source have to be returned for correction, and in some cases the papers are returned three or four times. Each case thus returned requires a letter of explanation. Yet the law, upon the whole, is rather a benefit to the settler at a distance, especially in this country, where rates of travel are unusually high.

At present the law allows only the registers and receivers of consolidated districts to charge for transcripts of records and other information furnished to individuals, who in turn generally derive more or less profit therefrom. Officers of the government should always stand ready to furnish the necessary information to the public, but those directly benefited by such information should pay a reasonable compensation therefor. Gratuitous labor and information are always in demand. In a land office they are staple articles, with which the market is never to well supplied. At least one-half the time of the land officers is taken up in waiting on and answering those who hesitate not "to ride a free horse to death." A fair compensation for such services would pay for the necessary outlay of clerical labor.

Very respectfully submitted,

W. H. SMALLWOOD, *Register.*
S. B. BROWN, *Receiver.*

Testimony of Frederic W. Perkins, dentist, Walker's Prairie, Stevens County, Washington.

WALKER'S PRAIRIE, *October* 9, 1879.

1. Frederic W. Perkins, Walker's Prairie, Stevens County, Washington Territory; dentist.
2. About 20 years.
3. I have not.
4. By study and observation.
5. In uncontested cases about one year from the time of payment. In contested cases it depends on whether the case is decided by the local land office or an appeal taken, and then how far the appeal is allowed.
6. I think that the present land laws induce many men with elastic principles to come so near perjury for the purpose of getting more land than they should get, even with a liberal interpretation of the laws, that it is almost a premium on that crime. The pre-emption, homestead, and timber-culture acts I think give more land than was intended by the framers of the law. The timber-culture act (although, as I take it, it should not apply to any land in easy reach of timber) is made to apply in sections where, although there may be no timber on the actual section taken, they are so surrounded by timber (a scattering timber thereon) that it amounts to about the same thing at last—a stretching of the facts that in any other case would be actionable, but is passed over in this. The homestead act is, I think, lame and unsatisfactory, insomuch as a homesteader does not have the same time to enter that the pre-emptor has, and in many cases loses his claim. For instance, I am a homesteader, poor, and far from the land office; I have no means of knowing that the survey is made and the plat recorded in the land office; some one who knows all these things waits until my time expires, and then pre-empts on me, and before I know anything I am either forced to litigate or leave my claim. I have known instances where this could occur, and men are more liable to this out in this part than almost any other.

The pre-emption laws are well enough, but in my opinion they, as well as all of the land laws, give too much margin. I would restrict all men to one quarter section; it is all that any one man can farm as it should be, and large farms do not open up a section as fast as small ones. This is in strictly agricultural districts. In timber I would restrict all purchasers to the same amount, to wit, one quarter section; in grazing sections to one section, provided they fenced it. I would make the fencing as necessary before getting a patent as the money.

I am of the opinion that 160 acres are enough for any farmer, if it is divided fairly between prairie and timber. I would give the homesteader the chance of getting 40 acres of timber for his own use in the same way that he gets his land; that is, giving any poor man who homesteads his 160 acres of farming land and also a 40-acre timber lot; this to the homesteader only. If any man has money to pre-empt, he can buy his timber.

7. The land in this county can be divided into four classes: agricultural, timber, mineral, and waste or grazing lands. That portion contained in Colville Valley is about divided into one-third good farming, one-third grazing, and one-third timber; south of the Spokane, one-half farming and one-half waste and grazing, with but *very little timber*. The lands that I call waste are rocky, sandy, and but little water in the fall

of the year; but still there are places along this belt where good grazing is had all the year. That part now given to Indian Moses, and being on the west side of the river Okinakane, is *almost all mineral;* copper, iron, silver, gold, tin, quicksilver, coal, lead, and black-lead are found here in paying quantities. Silver and gold are also found in Colville Valley; also great quantities of fine limestone, white, blue, and gray, with some indications of graphite. I think that the best way would be to survey all the farming lands, with the adjacent timber; then the other class of lands.

9. I have already given my views on this subject, and I would say again that 160 acres of land, well cultivated, is all that any man should get from the public domain as a gift, almost, from government. This, with a 40-acre wood lot, should satisfy any man not insane enough to try to get more than he can use.

AGRICULTURE.

1 and 2. The climate in this section is about the same as that of New England, with the exception of summer frosts, which make some of the tender vegetables uncertain in some localities. The rain falls principally in the spring and fall, with once in a while a day's rain in the summer, followed almost always by a frost. The snowfall is about 18 inches, and remains on the ground from two to four months. The lands do not require irrigation to raise grain, but sometimes gardens are benefited by it.

8. I think that all the grains that grow in the temperate zone can be raised here, and most of the hardy fruits, apples, &c. We find that the hillsides are not so liable to frosts as the *low hollows.*

Questions 9, 10, and 11 do not apply to this section.

12, 13. I think that fully two-thirds of this county is especially adapted to grazing, but for any man to get a homestead for grazing purposes the law would have to be changed, as he could not swear that he took the land to cultivate. I think that if any one was to have the right to homestead on grazing lands one section would not be any too much, for this reason: if land carries too many head of stock the wild grasses soon run out. A man should have sufficient range so that he can change his stock; and I would make it incumbent on all to fence their lands used for this purpose before getting a title.

14. I would give a certain time after the extension of the surveys (say two years) before giving the rights of private entry, and then only one section to one man.

15. About four beeves to the acre. I think this is the average of all bunch-grass counties.

16. About six head per annum.

17. Can't say.

18. Diminishing slowly.

19. Not the practice to fence. Cattle are fed during the winter in this section.

20. I think they would.

21. Streams and living springs.

22. About 12.

23. Run out; nothing left.

24. No.

25. Cattle and horse raisers do not want sheep near them. They cannot keep their stock on any range that sheep occupy.

26. I think about 15,000, in bands from 100 up to 3,000.

27. I can think of nothing further.

28. Sometimes the corners cannot be found, cattle having rubbed them down and the Indians having pulled them out.

TIMBER.

1. Large quantities pine, tamarack, fir, and cedar, maple, willow, and cottonwood on the streams.

2. There is no timber planted, fruit being all that has been planted.

3. The fact that a farmer can go on public lands and get all the timber necessary for his own use does not work well; they destroy more than they use, but not in proportion to the lumber cutter. I said before, and I say again, that the only way that I see is to give the homestead settler a 40-acre lot on the same terms as he gets his farm, but to him only. The pre-emptor should have the same right to pre-empt 40 acres of timber as he has to get his farm—that is, to pay for it; but no one should have the right, near farming land, of in any way getting more than 40 acres.

In the mountains, and in places where the farmer would not probably want timber, a man should be enabled to get a quarter section for logging camps, &c., but they should pay for it before cutting a tree. I think that this would make them more careful and do as little damage to young and growing timber as possible, for every tree that they damage the loss would fall on themselves and not on the country at large. Man is more apt to look strictly after his own than that of others is one reason for

this. As to the price of timber lands, it would depend on the quantity and quality of the timber standing thereon, from $1.25 to $10 per acre; and I would make it a penal offense for any one to cut any timber on the public domain for speculation. The fine can be paid, but if imprisonment be added men would think twice before risking it. A man can afford to pay the fine, for he makes it from the timber, but cannot afford the disgrace of imprisonment.

5. The second growth is much the same as the one cleared of the timber. The Hudson Bay Company, when they repaired their post at Fort Colville, about sixty years since, dug a saw-pit, and in that pit now grows several pines that are from 6 inches to about 12 inches in diameter. The growth is slow.

6. Fires almost yearly and are very destructive, deadening vast spaces, and the timber is dying out fast in these places. The Indians are the cause of almost all of the fires, and I do not know any remedy but their removal.

7. I have already said that without the ownership there will always be more or less waste and destruction of timber. The waste of the actual settler does not amount to much; but saw-mills and wood-cutters, and now the ties necessary for the Northern Pacific Railroad, will destroy much timber. I think that for every timber tree cut about three are broken down and destroyed, and the only legislation that would reach the subject would be, first, ownership as before stated; second, imprisonment and fine, or both, for trespass on surveyed lands or those offered for sale.

Settlers going into a new country unsurveyed must get rails, house-logs and fire-wood somewhere, and they must be procured from the public domain. There is but little waste committed, as the trees cut are small and the refuse is used for fire-wood. I would recommend that if any change is made in the land laws, or whether there is or not, an act should pass Congress granting the homesteader the same rights given to the soldier—that is that the time they have lived on their lands prior to survey should count them; but that they should live six months on the land immediately preceding the issuing of the patent.

The pioneer is but the soldier after all; he pins his life on his arm and starts to open up an unknown country, and after all the trials and hardships of the frontier he gets no more advantage over those that come after the heat of the day is passed and everything is quiet and safe. The old residents of the Northwest think they should have some reward for the hardships they have endured in opening up the country in the face of such foes as the Indians of this section have proved themselves during the last two summers. I think that the least that should be accorded them would be that the time that they have lived on their lands should count, making them equal with the pre-emptor who comes in in time to reap the benefits of the quiet times that have come. Let the homesteader get title after the expiration of his time—that is, if he has been one year on his place before survey, then his title at the expiration of four years is five years or more, then in six months from the date of the survey, or rather six months from the date of his entry in the land office.

8. The custom in this section is to cut all you want, either for your own use or for sale; the latter without much regard to waste or the destruction of surrounding timber. The man cutting the timber owns it until paid for cutting, or it being delivered.

9. I think that there should be appointed some persons, not connected by business with any one cutting timber for speculation, and every one so cutting timber should be prosecuted according to any law enacted on the subject, he to report to the district land office, but not subject to removal except by the General Land Office, and then only for cause. He should receive enough pay to enable him to devote the time necessary to the care of the timber in his district, informing himself of the character of all timber lands, the quantity and quality of the same, and the approximate value of the timber growing thereon.

In regard to the mining laws I know but little; nothing from my own experience, and but little from any other source.

I would add a few words about land scrip. I think that the way that speculators grab up all the best lands works a hardship on true settlers that should be remedied. You doubtless have heard more on this subject than I could write.

I remain, &c.,

F. W. PERKINS.

Testimony of D. W. Smith, attorney-at-law, Port Townsend, Wash.

The questions to which the following answers are given will be found on sheet facing page 1.

1. D. W. Smith, Port Townsend, Wash.; lawyer.
2. Seven years November 23, 1879.
3. I have; under homestead and pre-emption laws.

4. Making entries, final proofs, and practicing before district land office in contested entry.

5. From twelve to eighteen months after final proof; entry not contested. I was attorney for contestant in the case of Thomas Fleming *vs.* Gregory Bailer; contested pre-emption entry tried before district land office at Olympia, Wash., December, 1876, which was appealed to honorable Commissioner General Land Office, and has since never been heard from. Appeal was regular so far as heard from. Cause still pending before honorable Commissioner and undecided, as I am informed, from lack of clerical force. (Parties will die soon and settle their rights elsewhere if government don't decide between them soon.) The expense is simply enormous to the settlers in Clallam, Jefferson Island, San Juan, Whatcom and Snohomish and parts of Kitsap Counties, on account of the great distance from land office—from 100 to 250 miles—and inconveniences of travel. It is difficult making a farm in this timbered country, and four out of every five settlers have to mortgage their claims to get money to pay the purchase price and expenses of proving up, which it takes them years to pay off. The government should either create a land office at Port Townsend for the convenience of these counties or lessen the price of the land when over a given distance from a land office, or furnish some other adequate offset to such great inequalities.

6. 1st. Yes. The law contemplates that a competent person shall have the benefit of both the homestead and pre-emption acts. Yet if he takes a homestead he is practically barred of the other by virtue of clause 2 of section 2260, Revised Statutes, which forbids him from removing from his own land &c., unless he either perjures himself or makes a sham conveyance of his homestead to his mother-in-law for instance. The clause is inconsistent with the letter and spirit of the two laws, misleads settlers as to their rights, teaches them cunning to evade it, and ought to be repealed upon general principles.

2. That the "act to amend section 2291 of the Revised Statutes in relation to proof required in homestead entries," approved March 3, 1877, should extend to cases of final proof under the pre-emption law also. There is no reason whatever why applicants for final proof under one law should be compelled to go in person to the district (or local) land office any more than under the other, and it is a great injustice.

3. The act entitled "An act to grant additional rights to homestead settlers on public lands within railroad limits," approved March 3, 1879, is certainly an abortion. It was evidently the intention to give those who had been restricted to 80 acres an additional 80 acres, to make 160 acres, but the act, by limiting the settler to land "adjoining the land embraced in his original entry," substantially defeats its own object, for more than half of the settlers whom the act was intended to relieve cannot find land adjoining their original entry, and to relinquish their original 80 acres, with the years of improvements they have placed upon it, would be a greater loss than the additional 80 acres (taking 160 in another place) would be a gain. *If it is right to give such settler 80 acres more, they ought to have the right to take it wherever they can find it, whether adjoining their original 80 acres or not.* That act was certainly of premature birth, and ought to be changed to operate equally on all settlers alike.

4. Section 2261, Revised Statutes, prohibits the second filing of a declaratory statement by any pre-emptor, &c. This is a great hardship upon thousands of honest citizens, who may be found in all parts of the Western States and Territories, who have by this *technical* provision lost their right of pre-emption forever, unless Congress sees fit to amend the law. There is not an honest settler in the West who will not condemn it. The filing should be limited to *twice*, not *once*. It operates harder upon young men than any other class, who, through lack of forethought, and with undue haste, file declaratory statements upon a tract of land which may prove unproductive or worthless, and not worth the price, and they lose it and their right because they cannot file again. Thousands, again, who have filed declaratory statements in good faith, by reverse of circumstances become obliged to let the land and their right go. Now, as the fee which the pre-emptor pays upon filing declaratory statements, to wit, $3, amply pays for all labor in canceling the land he files for, &c., &c.; and as there can be no good reason for not allowing a second filing, except the fact that it would give the land officers a little more trouble (which they are amply paid for by said fee), the law ought to be so changed as to allow a second filing. The party who filed the second time would, as a rule, stick to it, and both government and settler would be better off. Should the law be changed as herein indicated, it would be necessary for the pre-emptor to make oath, at some stage of the proceeding, as to whether or not he had previously, at any time or place, filed a declaratory statement for the same or any other tract of land, and that he had never had the benefit of the pre-emption law.

5. The "act to provide additional regulations for homestead and pre-emption entries of public lands," approved March 3, 1879, ought to be repealed, as it amounts to nothing, and never will, except to burden the settler with more expense.

6. The act of March 3, 1875, giving Indians who have abandoned their tribal relations, &c., the right to homestead the same as white men may be all right applied to some of the tribes in the older States who have been under the influences of civiliza-

tion for half a century or so, but it is wrong as applied to the "Siwashes" on this coast, for the reason, which experience fully confirms, that it is an impossibility for *any Indian living with or in the vicinity of his tribe* to become what the law contemplates he shall be to come within its provisions inside of one generation. Nor is this principle of progression any more true as regards "poor Lo" than it is as regards any other race. It has taken the "noble white race" from four to six thousand years to reach his present state of perfection in *civilized* life, as we term it, and yet Congress expects the Indian, who stands where we stood six thousand years ago, to leap up by a single declaration in a day, hour, or minute to our standard. But it seems they do accomplish what it took us so long to do in a shorter time, as the annexed advertisement will show. And herein the force of my objection may be most appreciated. The fact is the Indian gets the land, while he remains an Indian still, and the government and its honest citizens are defrauded. The Indians who have taken the homesteads, as shown by these advertisements, are no more to be compared to a white settler in point of industry than a drone is to the working bee. The object of the government was to encourage them to labor like its own people and live by honest toil, which is landable; but this should be done in a manner not injurious to the government or other settlers, and it can be so done by giving them from 10 to 20 acres instead of 160. Ten acres is more than any of them will singly ever cultivate.

7th. It is agricultural, pastoral, timber, and mineral.

8th. If I understand the question, the rules which must govern the classification and disposition of the lands in Western Washington must vary according to the character of the lands; thus the timber lands, I mean good timber, what is termed here a "good logging claim," is not regarded as good for agricultural on account of poor soil, but time may explode this belief. At all events, it is valuable *now* chiefly for its timber, and should be disposed of similarly as at present under existing laws. Where minerals are usually found, up in the recesses of the mountains, the land is apparently valueless except for the minerals.

9th. I know nothing about it.

10th. I think the main principles involved in the present homestead, pre-emption, and timber-culture laws are right and cannot be improved upon. There are some defects which need remedying, and I have suggested a few of them, but the laws in the main ought to stand. Besides, the masses have become familiar with them.

AGRICULTURE.

1. Our climate is very mild the year round; not very hot in summer, and so warm in winter that many varieties of flowers bloom outdoors all winter. It is seldom that the mercury gets down to zero, and some winters we have no snow at all. We have two seasons—summer and winter. The winters are wet, the summers dry, yet neither so wet or dry as to interfere with raising abundant crops or following any kind of avocation except for a day or two at a time. The dry season or summer begins about May 1 and lasts until about October 1, but sufficient rain falls for all purposes. No irrigation required here.

12. Very small proportion.

13. No, not different materially from the present laws

14. No.

21. Mountain streams and springs.

28. Yes, it is almost impossible to find them.

TIMBER.

1. All timber nearly; best kind for lumber, furniture, ship-building, &c. Fir, spruce, cedar, maple, cottonwood, &c.

3. Sale where it is strictly a logging claim, price $10 per acre in tracts to one individual of from 40 to 320 acres. Timber land is so cheap under present system that large mill corporations have and now are gobbling up all the best timber lands in the Territory, which will prove oppressive by and by.

4. I would, if practicable, as thousands of acres of land are fit only for the fire-wood upon it, price $2.50 per acre 160 acres or less.

5. There is a second growth, slow, same as original forest; would not amount to anything in size for several generations.

6. Fires occur, but are generally not very destructive on account of the evergreen nature of the forests and moist climate. Make it a crime.

7. Logs, ties, piles, &c., are cut a great deal on the public lands, I am informed. I think farmers, miners, or any other local industry should be permitted to go upon any public lands for materials for repairs or building and the like, but not allowed to take any for purposes of sale or speculation. Make it a crime.

9 I think there is no way to prevent unlawful spoilation of timber except by the

enactment of suitable laws for its sale, and then keeping a secret agent of the government employed to prosecute any who take timber unlawfully, and seize what they have taken, tools, &c.

D. W. SMITH.

LEGAL NOTICES.

LAND OFFICE AT OLYMPIA, WASH.,
September 20, 1879.

Notice is hereby given that the following named settler has filed notice of his intention to make final proof in support of his claim and secure final entry thereof at the expiration of thirty days from the date of this notice, viz:

Job Gelloch-Kanum (Indian), homestead application No. 2042 for the NE. ¼ of section 15, township 40 N., R. 3 E.; and names the following as his witnesses, viz: H. A. Judson, of Whatcom County, Wash., and J. A. Tennant, of Whatcom County, Wash.

J. T. BROWN,
Register.

LAND OFFICE AT OLYMPIA, WASH.,
September 20, 1879.

Notice is hereby given that the following named settler has filed notice of his intention to make final proof in support of his claim and secure final entry thereof at the expiration of thirty days from the date of this notice, viz:

James Seclamatan (Indian), homestead application No. 2036 for the lot 2 of section 20, SE. ¼ of SW. ¼, and lots 2, 6, 7, and 9 of section 21, township 40 N., R. 3 E.; and names the following as his witnesses, viz: H. A. Judson, of Whatcom County, Wash., and J. A. Tennant, of Whatcom County, Wash.

J. T. BROWN,
Register.

LAND OFFICE AT OLYMPIA, WASH.,
September 20, 1879.

Notice is hereby given that the following named settler has filed notice of his intention to make final proof in support of his claim and secure final entry thereof at the expiration of thirty days from the date of this notice, viz:

Joseph Spekahum (Indian), homestead application No. 2059 for the NW. ¼ of section 15, township 40 N., R. 3 E.; and names the following as his witnesses, viz: H. A. Judson, of Whatcom County, Wash., and J. A. Tennant, of Whatcom County, Wash.

J. T. BROWN,
Register.

LAND OFFICE AT OLYMPIA, WASH.,
September 20, 1879.

Notice is hereby given that the following named settler has filed notice of his intention to make final proof in support of his claim and secure final entry thereof at the expiration of thirty days from the date of this notice, viz:

George Hock-sah-button (Indian), homestead application No. 2047 for the SE. ¼ of section 15, township 40 N., R. 3 E.; and names the following as his witnesses, viz: H. A. Judson, of Whatcom County, Wash., and J. A. Tennant, of Whatcom County, Wash.

J. T. BROWN,
Register.

Testimony of Robert G. Stuart, receiver of public moneys from land sales at Olympia, Wash.

OLYMPIA, WASH., *November* 14, 1879.

United States Land Commission, Washington, D. C.:

GENTLEMEN: My name is Robert G. Stuart, receiver of public moneys for the district of lands subject to sale at Olympia, Wash. I have lived on the Pacific coast over twenty-nine years, in the Territory of Washington eighteen years, and in this land district eleven years, during eight years of which I have been receiver, &c.

I never acquired title to lands from the United States except through direct purchase, but have improved wild lands both in the State of California and in this Territory.

All homestead claimants contend that they pay in expenses more than the value of lands they acquire, while pre-emptors say that they have to incur the same expense and then pay for the land afterward, frequently a double price to pay for roads that are never built; and I think their complaint is well founded.

The only radical change I would recommend in the present laws would be the abolition of all demoralizing oaths and testimony, which are expensive to the settler and but little protection to the government. Instead of this *have a government inspector* to make report from an actual view and inspection of the premises, confining the whole cost, first and last, within $30 to the settler on 160 acres of land.

Have no forced and expensive attendance at the district land office, but let the claimant send in his application by mail, stating among other things that he is a native-born citizen of the United States, or had declared his intention to become such, or was naturalized, &c., and had never before had the benefit of the homestead laws.

Accompanying this should be proof of citizenship by affidavit of the native-born as to the county and State of his birth, attested by the oaths of two of his neighbors that they believe him to be native-born, and in other cases by the record evidence.

Respectfully, your obedient servant,

ROBERT G. STUART.

Testimony of John A. Tennant, farmer and civil engineer, Ferndale, Wash.

The questions to which the following answers are given will be found on sheet facing page 1.

1. John A. Tennant, Ferndale, Wash.; farmer; by profession, civil engineer.

2. Twenty-two years.

3. Have acquired land under the pre-emption law, and have filed on land under the "homestead act."

4. Have been county judge, and as such filed homestead notifications, taken final proofs, and done a general business as agent for parties wishing to obtain land.

5. Under the pre-emption law, those who make *actual settlement* for the purpose of having a permanent home, avail themselves of the extent of time allowed by law (to wit, thirty months) before making final proof and payment. Those who settle for the purpose of simply obtaining a title either to sell, or perhaps at some future time live upon the land, make their proof and payment at the end of six months. We get our patents back from Washington in from six months to one year and a half. Under the "homestead act" a majority avail themselves of all the time allowed by law. Expense for a pre-emption, $50, besides price of land; expense of homestead, $75. These are in uncontested cases; in contested, so many factors enter I cannot even give a *good guess*.

6. Yes; in the "homestead act" the provision "that absence for more than six months at any one time," &c., shall be promptly repealed, parties (and they are numerous) avail themselves of this, putting the construction on it that a visit once in six months is all that is needed, and thus hold the land to the detriment of actual settlers. One case in point: A man holds a homestead in my immediate neighborhood who resides with his family in a town one hundred miles away; has never had all his family on the place at any one time; has never taken his household goods there; has no furniture in his house; has not cultivated one rod of land; but, punctually, once in six months comes here, gets his supper at the nearest neighbor's, stays on his place all night, and leaves at daylight in the morning, to return again in six months, and says he has not abandoned his claim for six months. This may be an extreme case, but will show you the working of that clause in the law. Let this be stricken out, and make the residence and cultivation continuous.

7. Generally level, being the valleys of several rivers and the deltas at their mouths. As we go back from tide-water the country becomes broken, and soon the foot-hills of the Cascade Mountains appear. This is true generally of all of "Western Washington" land, mostly timber. About the only open or prairie land is the "tide flats or marshes" at the mouths of the rivers. These are being *diked*, and are highly productive. Timber, fir, cedar, spruce, hemlock, cottonwood, maple, alder, and birch along streams and on *bottoms*.

8. To fix the character of classes of land and mode or price of surveying must be done by geographical divisions; no general rule in my opinion will answer; have had experience in public land surveys, for instance, in Walla Walla County, land reported by the first survey as second and third rate, now (without irrigation) thirty to forty bushels of wheat per acre.

9. I know of nothing better than the system now in use. It is economical, easily done, and sufficiently accurate for all practical purposes. The geodetic is doubtless more correct and for open prairie country practicable, but for the heavily timbered western coast utterly impracticable; am a surveyor by profession.

10. I consider the present land laws *very good* with the suggestion before made in reference to striking out clause "*six months*" in "homestead act."

AGRICULTURE.

1. Very temperate and even; rainfall rather excessive; but two seasons, wet and dry, in about the proportion of four dry to eight wet; some winters no snow, occasionally 8 to 10 inches, which remains no great length of time; no need of irrigation.
2. Rain falls from October to May, and some in all months.
The remaining questions under agriculture do not apply to my vicinity, and need not be noticed by me.

TIMBER.

1. *All timber.*
2. None; no need.
3. By sale. One quarter section or less quantity to each applicant, at not less than $5 per acre, and purchase made after thirty days' notice, and on the oath of applicant that he has not had the benefit of the act, does not own 160 acres of land, and that it is not made for the use of any other persons; to prevent companies from controlling the business and allowing laboring-men to own timber land and to profit by the sale of his timber. The price may seem high, but these lands are very valuable; many acres that will cut 100,000 feet of lumber.
4. By all means into at least three grades, and prices $5, $4, and $3 respectively.
5. Always a second growth of same timber as formerly grew; the growth very rapid, but from the newness of the country cannot tell the length of time necessary to make timber of size fit for lumber.
6. Forest fires are very prevalent, and originate usually from the use of fire in clearing land and cutting roads. One a few years ago swept over hundreds of sections. They are very destructive; great tracts are left with nothing but the burnt and charred remains of once noble forests. I know of no mode of prevention. Occasionally we have a dry season, and from the resinous nature of the timber when a fire starts it burns with unparalleled fierceness.
7. There have been some prosecutions and convictions for cutting timber in this county, but I am unacquainted with the amounts or extent of the trespassing.
8. If a man wishes timber for use and does not happen to have on his own land just what he wants, and he finds what he wants on public land, he just takes it; and the ownership is by custom securely vested in the one who fells.
9. In the local land office by all means.

LODE CLAIMS.

There is no mineral here mined except coal; and as far as my knowledge extends, titles were obtained prior to the enactment of the mining laws.

PLACER CLAIMS.

None in this part of the country.
Respectfully submitted,

JOHN A. TENNANT.

Testimony of Wyoming Stock Growers' Association, of Wyoming Territory.

Hon. J. A. WILLIAMSON,
Chairman Public Land Commission, Washington, D. C.:

DEAR SIR: In accordance with your request, the following notice was published by the executive committee of the Wyoming Stock Grower's Association:

NOTICE.

Notice is hereby given that a meeting of the Wyoming Stock Growers' Association will be held in Cheyenne, at 10 o'clock a. m., Tuesday, November 18. General Williamson, Commissioner of the General Land Office at Washington, has left with the secretary a series of questions to which he invites the serious consideration of our stock owners. These questions refer to the permanent disposal, by sale or otherwise, of all United States grazing lands in this vicinity. It is necessary that our reply should reach the Congressional Public Lands Committee at Washington before December 1. The subject is important, and a full attendance of representatives from neighboring associations and of our own is earnestly requested.

THOS. STURGIS,
Secretary Wyoming Stock Growers' Association.

Pursuant to this notice, the association met at the city hall in Cheyenne, Wyo., at the day and hour mentioned. The session continued throughout the day and through the forenoon of Wednesday, the day following.

The attendance was large, and included, besides resident stock growers of Wyoming, representative men from Western Nebraska and Northern Colorado. It was further increased by the attendance of the members of both houses of the Wyoming legislature, many of whom participated in the debate.

The object of the visit of your Commission was fully explained to the meeting, and the suggestions made by the Commission as to the method proper to be adopted in disposal of the United States grazing lands were fully discussed.

That the sense of the association might be known unmistakably, the four resolutions that follow were read in numerical order by the secretary. Each was then separately submitted to discussion and amendments invited, when the general plan was approved but details objected to.

RESOLUTION NO. 1.

Resolved, That in our judgment the best methods for disposing of the United States grazing lands throughout Wyoming is as follows: That a cash valuation of five cents per acre be placed on all lands without reference to their character or situation. That free entry be permitted in amounts of not less than 160 acres, taken by legal subdivision, and to as large an amount as the purchaser desires, limited as below by the right of other claimants; that one year from the 1st of January next, following the passage and going into operation of this act, be allowed to all occupants of ranges in which to purchase; that is between mutual occupants of one range who cannot agree upon the proportion to be entered by each. The register and receiver of the United States local land office shall decide, basing their decision on the cattle taxed to each, and so, *pro rata*, the amount of land to each; that after the expiration of one year the land may be subject to entry by any one.

This resolution was discussed by a large number. It received in its general features the support of three gentlemen, but the preponderance of the debate was strongly opposed to it. It was lost.

Vote: Three in favor, remainder of association against.

Resolution No. 2 was then offered:

"*Resolved*, That all the lands, without reference to the character or situation, be offered for cash entry in any amounts desired by the purchaser, but not less than 160 acres, taken by legal subdivision, at $1.25 per acre, this price to be maintained for one year from the 1st day of January after the going into operation of this act; at the end of that year the price on all unsold lands to be lowered to $1 per acre; at the end of two years from the time of going into operation of the act it be further lowered to 90 cents; at the end of three years to 80 cents, and so on decreasing 10 cents per annum until the figure of 10 cents is reached. The year following it shall be reduced to 5 cents. One year from the going into operation of this act shall be allowed to actual occupants to purchase after each reduction in value. Conflicting claims between actual occupants to be adjusted by the register and receiver of the United States local land office in proportion to cattle taxed to each party."

This was debated, and lost by a unanimous vote.

Resolution No. 3 was then offered:

"*Resolved*, That the United States Government lease the said lands in tracts, by legal subdivision, for the term of twenty years, at the rate of one-half cent per acre per annum, which we hold to be 10 per cent. on the value of the land, for grazing purposes; that the amounts of lands so leased be in amounts as desired by renter, subject only to conflicting claims of a joint occupant, in which case decision shall be made by the register and receiver of the United States local land office on the basis of the number of cattle taxed to each applicant the preceding year; that at the expiration of any lease or during its continuance the renter may, at his option, buy the land so leased to him at 5 cents per acre cash, but should he not so buy on or before the expiration of his lease the said land shall be open to entry by any one at said price of 5 cents per acre when the lease shall have expired."

This was debated and lost by a unanimous vote.

Resolution No. 4 was then offered.

"*Resolved*, That in our judgment the interests of stock owners would be best subserved by the continuance of the present system, which permits only the securing of title to small tracts of land; first, because we believe the system of cash entry and gradation, and to a less extent that of leasing, is opposed to our theory of government in that it enables individuals to acquire the monopoly and control of immense tracts of land, and concentrates the business in the hands of a few men. It will work great hardships to the owners of small herds, who will be unable to buy their range and must eventually leave the business; second, that we believe the people of the United States at large are now greatly benefited by the distribution of the stock business through hands of many small owners, and by their consequent prosperity, than by its absorp-

tion in the hands of a few, and that the country will gain more by such widely spread industry than it can from the sums that may be realized from the sales of these lands; third, that in our opinion the question of whether grass will not disappear from these ranges with constant feeding is yet unsettled, and that the stock business will not warrant the investment of so large a per cent. of capital as one-sixth in what may in a few years be barren and worthless property; fourth, that we believe the practice of confining cattle within any positive and impossible limits, however large, unwise, and dangerous from the severe and destructive storms, and the consequent necessity that cattle should drift very widely at such times for food and shelter, and we think such a risk would not be compensated by any or all the benefits derived from the exclusive use of the ranges purchased; fifth, that a usually fair observance of each other's rights has been the rule among ranchmen and owners of stock, and that thus far self-interest has proved a safeguard against the heavy stocking of the range, and that we would rather trust for maintaining our rights free from encroachments to the community of interests and the sense of equity that is the rule here than to see a system adopted that must excite serious quarrels between occupants of ranges, and a bitter feeling of injustice among the best stockmen, who, unable to buy their lands, will see themselves in time deprived of their business, and be obliged to sell and seek other employment."

Debate followed, expressing in various forms approval of this resolution, and it was adopted by a unanimous vote.

After further discussion the following was added:

"*Resolved*, That while the unanimous sense of this association is opposed to any legislation that seeks to change the present land system of the United States, still, should such legislation be contemplated by Congress, it must, in order to meet the peculiar nature of this country and the character of the cattle business, combine the following:

"A price not exceeding 5 cents per acre.

"A term of years for payment of the same.

"Privilege of purchase limited exclusively to actual occupants of the land."

Upon motion, the secretary was instructed to add to the fourth resolution (which had received the approval of the association) an explanation in greater detail of the reasons for which the members opposed any change in the method of disposing of these lands. Said explanation is attached hereto in a separate paper.

The executive committee were directed by the association to forward the result of their meeting to your committee; and we hereby, with respect, submit the same, requesting that you give it due weight in your deliberations and incorporate it in your report as the views of the stock owners of these portions of Wyoming, Colorado, and Nebraska.

J. M. CAREY,
E. NAGLE,
THOS. STURGIS,
Executive Committee Wyoming Stock Growers' Association.

CHEYENNE, WYO., *November* 22, 1879.

Memorandum of reasons for which this association disapproves of any change in the present United States land system.

In addition to the reasons assigned in the accompanying resolution, No. 4, we offer the following:

1. That the Territory is young, its settlement covering but ten years; that the cattle business is in its infancy, a large majority of the herds having more or less indebtedness upon them; that to clear this off and acquire a surplus for investment in land must be a work of time; that to open the lands they graze over to general entry at the end of a year would injure them greatly; that under the present system our population is rapidly increasing, because owners of small herds find grazing facilities, and that under a changed system, permitting entry of large tracts, this increase would cease, and population might even diminish.

2. That the owners of these lands would be few in number to the voters of each county, and that strong reason exists to think that the lands would be exorbitantly taxed.

3. That the lands must be fenced in large tracts to permit the necessary traveling by cattle during storms, and that the necessity for keeping open broad county roads through them would limit their size and add greatly to cost of fencing.

4. That the danger of extensive burning of the ranges is a very serious one; it has occurred widely this year. Under a system of ownership of large tracts the danger of incendiarism from parties believing themselves injured, or for any other reason lawless, would be greatly increased, and cannot be guarded against; that now we can allow our stock to drift by common consent onto unburnt ranges. Under a system of ownership we could only do so by consent of owner, which might be refused, in which case total loss would result.

5. That on calculation it appears that even at the low price of 5 cents per acre for the land, added to cost of fencing, which in a treeless country must be done with

wire, the investment in real estate, apart from annual outlay in repairs of fences and taxes, would be from one-fifth to one-sixth of the capital invested in the stock ranging over said area; and that in our judgment the cattle business would not warrant such an investment and could not be profitably pursued if such purchase were necessary.

6. That under any system permitting the cash entry of large bodies of land much would pass into the hands of stock companies or associations, on account of the inability of present occupants to purchase. Such companies or associations would be represented here by a single or but a few persons; and the results, instead of adding to the permanent wealth of the Territory, would be to a great extent carried out of it.

THOS. STURGIS,
Secretary.

Estimated cost of range and fencing.

	Value.
500,000 acres, allowing 25 acres per animal=20,000 head	$300,000
500,000 acres at 5c., $25,000. 500,000 acres=800 square miles; 800 square miles=40×20 miles=120 miles, at $2.50 per mile	$30,000
Land	25,000
	55,000

CHEYENNE, WYO.,
November 15, 1879.

To the Public Land Commission, Washington, D. C.:

GENTLEMEN: In answer to your interrogatories, as per your circular of blank date, I have to reply as follows, viz:

1. In answer to question 1 in the first subdivision: My name is John F. Coad. I reside in the city of Cheyenne, Wyo. My occupation is that of stock-growing, and my stock range is situated in Cheyenne County, in the State of Nebraska.

2. Eight years I have been growing cattle in the same locality.

3. Have desired to do so, but found it impracticable under existing laws in quantities and at prices which would justify me in so doing for grazing purposes.

4. The practical workings of the public-land laws have not been good in this locality, for the reason that we have no agricultural lands worth mentioning, and under existing laws a citizen can only obtain title to a very small quantity of land for grazing purposes; which might be sufficient for agricultural, but utterly useless for grazing purposes.

6. In my opinion the public-land laws are not adapted to the wants of our people, who inhabit a semi-desert country, suitable only for grazing purposes, where it requires 30 acres of land to support one head of cattle. A law permitting actual settlers to pre-empt from one to three townships of land at low prices, say 10 cents per acre, or leasing said lands to actual settlers for a term of ten or fifteen years at half a cent per acre, would be beneficial alike to the citizen and the government.

7. Our section of country (Cheyenne, Nebr.) is undulating, rolling, sandy land—all grazing; no timbered or mineral lands.

8. By classifying the lands as grazing, timber, mineral, coal, &c.

9. For grazing lands subdivide the country into large tracts, giving to each tract a frontage on or across some stream of living water, and extending the tract back half way to the next stream, river, or water supply, so as to include all the lands in some one of the several subdivisions of the entire country. This would necessarily make the subdivisions unequal in quantity, but equally well adapted for the only uses for which nature has designed them, viz, grazing.

10. I only suggest as to grazing lands. I have no interest in any other kind and do not pretend to be well informed in reference to them. I am of the opinion that it would be advantageous to both the government and the actual settler if the government would by pre-emption sell to actual settlers from 1 to 4 townships of land each at from 10 to 12 cents per acre, or lease the same land to actual settlers in like quantities for a term of ten years at from one-half to three-fourths of a cent per acre. The quantity of land so to be sold or leased to be restricted to the individual in amount in proportion to the number of cattle, horses, or sheep he may have or own which he proposes to graze upon the public domain; and in estimating the amount of land necessary for the raising and sustenance of one head of cattle, I would place the amount at from 20 to 30 acres, the quantity of grass on a given acre varying very much within short distances.

Under your subdivision "agriculture," my reply to your questions are as follows, viz:

1. Our climate is dry and cool in summer and dry and cold in winter. Have little or no rain from 15th of June to 15th of November, and then light snowfalls, with an occasional heavy snow storm, until about the first of the following May.

2. From May 1 to June 15, in light showers; no other rain worth mentioning.

3. None.
4. One hundredth; not more for the want of water supply.
5. No attention is paid to agriculture; no crops of any kind are raised. There is no timber suitable for fencing with that material and no effort made to raise crops of any kind.
6. Do not know.
7. North Platte River, which contains a good supply of water, but it is impracticable and would not pay 6 per cent. interest per annum on the investment required to divert the water from its channel and carry it on to the lands sought to be irrigated.
8. Knowledge limited; observation none; experience none.
9. Have no knowledge of the working of ditches; have none in my section of the country.
10. The water has not been taken up or appropriated by any person or persons.
11. Have no conflicts about water rights.
12. About ninety-nine one-hundredths.
13. I can see no objection to both the homestead and pre-emption laws being extended to the grazing lands with the changes I have named as to quantity and price for pre-emption and a like quantity for homestead. See my answer 10 under first subdivision.
14. In my judgment it would be advisable for the government to put these lands in market to actual *settlers only* as homestead or pre-emption claimants as before mentioned. Were it otherwise the large capitalists of our country would soon own all or most of our winter-grazing lands and compel those persons actually engaged in stock-growing or desirous of embarking in that line of industry to purchase or rent from the speculator.
15. From 20 to 30 acres, the grass being much better in some localities than others in the same section or township.
16. I do not know.
17. About 32.
18. Diminished.
19. As a general thing they do not. I have fenced in about 100,000 acres and have found that it works well. Have tested the system for three years.
20. It would.
21. The North Platte River.
22. Do not know; we have no sheep in our immediate neighborhood.
23. It has diminished very much.
24. Cattle will not graze on lands pastured by sheep at the same time.
25. I have heard of controversies between cattle and sheep growers but know nothing myself about such matters.
26. We have about 150,000 head of cattle and about 500 head of sheep.
27. See my answers hereinbefore given on same subject.
28. There is little trouble, but not a large amount.

We have no timber worth mentioning in our county, and no coal or mineral lands whatever.

I am, gentlemen, very respectfully, yours truly,

JOHN F. COAD.

Testimony of Stephen W. Downey, Delegate in Congress, attorney and counselor at law.

LARAMIE CITY, WYO., *November* 12, 1879.

Hon. THOMAS DONALDSON, *Public Land Commissioner, Washington, D. C.:*

DEAR SIR: Your letter of September 16, transmitting copies of circular for distribution, and containing a request for me to communicate my views upon the matters to which the circular relates, was duly received. I have made the distribution, as requested, and have the honor to submit below my views upon the subjects involved, making your questions the basis.

PRELIMINARY QUESTIONS.

1. Stephen W. Downey, attorney and counselor at law, Laramie City, Wyo., Delegate in Congress from Wyoming.
2. Ten and a half years.
3. I have made filing under the desert-land act, and application for patent to several mineral claims which are still pending.
4. I have made a large number of filings and procured a great number of titles under the various acts of Congress for clients; have been employed as counsel in contested cases, and have on file in my office the records of a large portion of the surveys of public lands which have been made by United States deputy surveyors in Wyoming.

5. In uncontested cases, the time, exclusive of duration of settlement before patent required by law, is short. The expenses, including attorney's fees and cost of survey, but excluding land office fees and government price of land, are about $30. In contested cases, the additional costs range from $100 to $1,000 and additional delay is from one to five years.

6. I have observed but few. I will speak of one. Land office officials require final proof of locators to be made and authenticated at county seat of the county within which, or at the land office of the land district within which, the land is situated. This requirement frequently puts settlers to considerable trouble and expense: *e. g.* many settlers proceed from the southern part of Wyoming to the northern part of Colorado. The county towns in the southern part of this Territory are the convenient and natural places for the business transactions of such settlers. Through these towns they must pass and travel a long distance to reach the county seat of their county on the plains of Colorado, east of the mountains, and still further to reach the land office of their district at Central City, Colo. In my opinion the defect in the practical operation of the laws necessitating such inconvenience and expense could be remedied without any corresponding detriment to the service by a rule allowing settlers to make proof at the most convenient county seat, authenticating the same by signature and seal of the clerk of the district court.

7. Lofty altitude, the Laramie Plains and Platte Valley being 6,000 or 8,000 feet above sea level. The surface is divided into plains, rolling lands, and lofty mountains. Spruce, pine, fir, and aspen forests abound in the mountainous districts. Belts of valley and plain lands, from two to five miles in width along the principal streams, are irrigable therefrom, and it is believed that many remoter portions are irrigable by means of wells, with windmills to raise the water to the surface. The mineral resources of Wyoming are but little developed, though many mineral districts are known to exist, some of which are extensive and important. The coal and iron fields of Wyoming are immense, the former being lignite, and in veins ranging from a few inches to twenty-seven feet in thickness, the latter being found in various forms of ore, among which are prominent hematite of very superior quality, said to be suitable for the manufacture of the best steel, and extensively used for metallic paint, and mountains of almost pure metallic iron. There are several large petroleum fields. There are also lakes containing inexhaustible supplies of soda, both in the form of carbonate of soda in solution (these being about sixty miles northward of Rawlins) and sulphate of soda crystallized, these being about fifteen miles southwesterly from Laramie City, in townships 14 and 15 north, of range 75 west, of the sixth principal meridian. The soil and climate are favorable to the growth of wheat and barley where irrigable. The open country is generally favorable to winter and summer grazing. The northern part of the Territory has less altitude than the southern, and is said to be more favorable to agriculture.

8. By a general rule as to the relations of different parts of Wyoming, one to another, but as to the whole country geographical divisions might profitably be made, on account of approximate exclusiveness of interests in certain sections, nearness to markets, and for other reasons.

9. The present system of parceling appears to me, all things considered, the most practicable. Discriminations between agricultural and pastoral lands, if discreetly made and honestly carried out, would doubtless be advantageous; but such discriminations would, in my opinion, open the way to the perpetration of frauds. Allowance of larger average to single locators, under the pre-emption and desert-land acts, would probably increase the sales of public lands. Smaller subdivisions than 40 acres and permission to locate on separate and detached lots would suit locators, but would undoubtedly result in closer culling, only the most desirable lands being likely to be chosen, leaving all the poorer and undesirable lands unoccupied.

10. I know of none.

AGRICULTURE.

1. Cool and dry; some seasons sufficient rainfall to obviate necessity of irrigation; usually insufficient; heavy snows in mountains during winter keep streams full till July.

2. Rainfall very uncertain; sometimes almost daily showers in May, June, and July; other seasons scarcely a shower during the whole summer. The streams are full when needed for irrigation.

3. Perhaps 1 per cent.

4. Perhaps 10 per cent.

5. Wheat, barley, oats, potatoes, turnips, parsnips, onions, cabbage, and other vegetables.

6. Twenty-five to forty inches, miner's measurement.

7. In this part of the Territory the Laramie River and its tributaries, and several lakes.

8. I have had little experience in irrigation, but from the known constitution of

the soil in this region believe that irrigation would greatly enhance productiveness for a term of years. The greatest elevation at which I have known crops to be raised by my own observation is 8,000 to 9,000 feet.

9. The water actually turned upon lands for the purpose of irrigation is probably all exhausted by absorption and evaporation, none or very little returning to the stream from which it was drawn. Irrigating canals and ditches usually have outlet through which any excess of water not drawn off for irrigation is returned to the stream whence it was drawn. No local regulations or restrictions regarding this matter have been yet established here.

10. What has thus far been done here has been so done to experiment upon the practicability of such enterprise in such climate, with such constitution of soil and at such altitude. The principal enterprise of this character in Wyoming of which I have any knowledge is that of the Pioneer Canal Company of Laramie City. By this company a ditch or canal about 33 miles in length has been constructed, tapping the Laramie River about 25 miles above the city, at a point between Jelm and Sheep Mountains, on the left bank, leading the water out upon the Laramie Plains, passing about 2 miles to the westward of this city. This work is now about completed, and is intended to be available for irrigation the ensuing season. It is proposed to hold the water-right under the sanction of section 2339 Revised Statutes, and an act of the Wyoming legislature, entitled "An act to create and regulate corporations," approved December 10, 1869, sections 28 *et seq.*

11. None have arisen that I am aware of, but should present undertakings prove successful, and other similar ones ensue, conflicts may arise unless wisely and seasonably guarded against by law.

12. As to soil, from one-fourth to one-half; but, owing to the relief of surface, irrigation would be impracticable upon a larger portion.

13. It is, in my opinion, impracticable to establish pastoral homesteads at present. It seems to me that as large a portion of the lands as possible should be reclaimed by irrigation for agricultural purposes, and at the present state of development and advance of experiment the demarkation between lands really and exclusively pastoral, and valueless for other purposes, and such as may be rendered agricultural is impracticable. In case of the establishment of such homesteads, in my judgment the amount should be about one section to each settler.

14. At present, no. If put in market, in my judgment the amount should be limited.

15. Two to three acres here. Compares favorably with other plains.

16. One hundred.

17. Twenty.

18. Little apparent change in ten years.

19. A few only at present. Am not aware that fenced ranges have been tested in winter.

20. Stockmen say not. Breeders careful in the selection; breeding animals would probably improve their stock by such specific range system, while the stock of those careless in this regard would probably deteriorate.

21. Flowing streams, mainly supplied by melting snows and springs in the mountains, and large lakes.

22. Seven to ten.

23. Probably diminished.

24. Cattle are said to abandon ranges grazed by sheep.

25. Serious conflicts have not arisen in this section, although some hostility against the increase of sheep-raising and wool-growing probably exists among growers of neat cattle.

26. Number of sheep in county, 50,000; number of neat cattle, 60,000; number of horses, 3,500. Sheep in herds from 500 to 2,500; larger single herds are not advisable. Cattle range at will.

27. None.

28. None. A few corner-stones have been removed, but from those remaining the *locus* of corners whose monuments have been removed can readily be fixed.

TIMBER.

1. The plain lands are barren of timber; the mountainous districts are generally timbered. The timber is principally evergreen, consisting of pine, spruce, fir, hemlock, and cedar, with some aspen, cottonwood, and willow. The timber is of slower growth than in regions having less altitude. The pine, spruce, and hemlock is more windy in growth and yields a small percentage of strictly clear lumber. Native lumber rates lower in market, but for durability is doubtless superior to Eastern lumber. For bridge floors, floors of stores and uncarpeted public offices, native flooring is said by builders to outwear even the walnut and ash of the East. I cannot vouch for this from observation.

2. I am not aware that any trees have been planted in this Territory except about homes, for shade and ornamental purposes, and these are principally from the native

forests, a kind of mountain willow being most frequently selected. The growth is somewhat slower than that of the rock-maple or sugar-tree in the East.

3. I would not dispose of them in this region at this time, but hold them for the common use of settlers, to be devoted as required to the development of the resources of the Territory and adjacent regions. Fine grades of lumber, as before stated, are produced here only in very limited quantities, large quantities of Eastern lumber being imported for use here. Exportation of Rocky Mountain lumber is impracticable from the fact that there is no demand for it abroad at the necessary cost of its production and transportation. It is therefore only available for the use of settlers in adjacent regions, and for the industries and enterprises in which they are engaged. A division or parceling of the timber lands among settlers by sale or grant is impracticable, the timber being aggregated in large mountainous tracts at an average distance of twenty to thirty miles from the settlers' homes, precluding the constant supervision essential to the protection of individual property rights in new and sparsely settled regions. Parties engaged in mining and reducing ores and settlers on tracts immediately adjacent to timber tracts would have inducements to purchase in small lots. Apart from these, except for speculative purposes, there are practically no inducements to purchase timber lands. Regulations for parceling and selling would foster just what the Interior Department professes to have been trying to guard against during the present season. If the government determines upon the policy of allowing no timber to be used from the public domain without the return of revenue, some discreet regulations for the payment of royalty would in my judgment be more conducive to the interests both of the government and people than any regulations for the parceling and sale of lands.

4. Not in Wyoming; but if sales are determined upon such classification would be not only expedient, but necessary to just and equitable disposal.

5. There is a second and thrifty growth both in districts burned over and chopped off.

6. The origin of forest fires is difficult to ascertain. During the present season some of the most destructive fires have been maliciously set by the Ute Indians, destroying more timber than has been cut in Wyoming for *all* the uses of civilized life since the organization of the Territory, including railroad ties, fuel, and lumber. Other very destructive fires are undoubtedly started by the culpable carelessness of hunters and travelers, who neglect to extinguish their camp-fires. The timber annually used is not 10 per cent. of that annually destroyed by fire. I think the law should visit heavy penalties upon forest incendiaries, even those who become so through neglect or failure to exercise even extraordinary precautions. A few examples, upon substantial proof, would have a healthy restraining influence.

7. Depredations for the uses of life, amounting to infractions of law, have in my judgment been made very rarely, if at all, in this region. The act of Congress approved March 2, 1831, entitled "An act to provide for the punishment of offenses committed in cutting, destroying, or removing live-oak and other timber or trees reserved for naval purposes," extracts from which appear as sections 2461 and 4751 Revised Statutes, in my judgment was designed at the time of its passage by the national legislature to inhibit the use of timber only so far as such use should deplete sources of supply for the anticipated wants of the Navy, of which depletion the Secretary of the Navy should be the judge. Unless it can be shown that the timber here used in the building of homes, in the fencing of farms, and the supply of fuel (the two latter being taken almost exclusively from the dead timber) has cut short the sources of supply for anticipated wants of the Navy, I am not aware of infractions of law through forest depredations for the uses of civilized life. No legislation, in my judgment, is necessary to prevent such use of timber.

8. The custom is to cut and use such timber from the public forests as is required for building, mining, fencing, and other domestic and industrial purposes. The same opinion obtains relative to the ownership of felled timber, as is held in regard to gold taken from placer ground, quartz from lodes, grass cut and converted into hay, and water carried out by irrigating ditches, to wit, that it is and of right ought to be the property of him whose industry hath wrought the change.

9. *Cela depend.* Except in maritime parts of the country the administration of restrictive laws upon the use of timber, if such laws are deemed politic, would seem naturally to pertain to the Interior Department rather than to the Navy Department. Believing such restrictions to be impolitic, and their rigid enforcement to be certain to result practically in the restriction of the settlement, growth, development, and prosperity of regions adjacent to the Rocky Mountain timber lands, where and for which this timber is alone valuable, I should regard the least rigid enforcement of such restrictive laws as the most desirable administration.

This being a question of great moment to our people, I have hitherto communicated at length my views to the Secretary of Interior, and later to the Secretary of the Navy, in a lengthy letter, a copy whereof is herewith inclosed, to which your attention is earnestly invited, as a tolerably full expression of my views upon the timber question.

LODE CLAIMS.

1. Ten years' experience; chiefly in the Black Hills Range and Medicine Bow Mountains of this Territory, in organizing and generally directing prospecting, mining, and milling enterprises, at present having two stamp-mills running—one in Centennial mining district, the other in Douglas mining district—both in the Medicine Bow Mountains. My attention has been directed mainly to organization and financial management, and not to actual work or personal supervision, nor have I had experience in mine litigation. My experience has been acquired at a cost of about $30,000 worth of experiments.

2. In regard to vertical veins or such as have a pitch not less than 45° from the horizon, the present law (*i. e.*, that approved May 10, 1872), so far as it relates to the exclusive use and enjoyment of the vein itself for 1,500 feet in length, with its dips, spurs and angles, by the discoverer thereof, I approve; but in so far as it excludes others from discovering and appropriating any other really distinct parallel vein, I disapprove it. I think the discoverer should have whatever vein he discovers, and surface ground sufficient to work the vein its whole length, and until patent issues he should not have the right to exclude prospectors from searching for other veins; but upon the discovery or supposed discovery of a new vein, if within a certain distance fixed by law, from the established center-line of former discovery, the onus of proof should be upon the latest discoverer that he has a distinct vein. Upon such proof, he should have exclusive proprietorship, upon compliance with the law in other respects, within any distance not less than 50 feet from the nearer wall of earlier claimant. The method of proof above referred to should be fixed by national law, and not left to department regulations, still less to mining district rules.

3. My attention has not been directed to this subject.

4. Veins of the character considered in answer to second question are usually discovered and opened at the top or apex, by which I understand either the outcrop or crevice between walls at the top of bed-rock. Veins discovered by driving prospecting tunnels are of course excepted, and the apex in such case would be determined by raising a winze or shaft to the surface. The course of outcropping fissure veins can be ascertained usually by moderate and discreet outlay. The dip often changes as work progresses, and a knowledge of what the change may be seems not essential to defining the claim under existing laws.

5. Virtually answered above.

6. It has not as to such veins.

7. I cannot understand how two parallel seams could have one outcrop. Two veins of different corners might unite and outcrop at point of union. I have known some contests in cases of this kind.

8. I would suppose this question to apply to a case where one vein had two outcrops, not two veins with one outcrop. In this view no cut-off of original locator has come under my observation.

9. None wider have come under my personal observation. I do not know the width established by local law or rules in the Comstock region.

10. If width by local rules be restricted to the minimum authorized by law, *i. e.*, 50 feet, 25 feet each side, yes; if width by local rules be expanded to the maximum, *i. e.*, 600 feet, 300 feet each side, no, or very rarely, if the real outcrop be traced for any considerable distance and the location be directly taken.

11. I do not know of any such practice under the law. I should regard the toleration of such practice absurd.

12. I do not see how B's location in the case supposed could cloud A's title in the least degree, unless B should prosecute work on vertical shaft to such depth as to cut A's vein and lay claim to it as a distinct vein. I do not see that even this could cloud A's title, but might result in trespass upon his property and loss of his ore. But if in the case supposed B should cut a vein really distinct from that upon which A's claim is based, although outcropping in the surface ground of the latter, that B ought in justice to hold his vein is consistent with the view which I expressed in my answer to second question in this title. I do not maintain that he could do so under existing statutes. This question applied to horizontal, or nearly horizontal veins or deposits, opens a new field for discussion. Leadville, White Pine, Nevada, &c., from experience and observation should make full answer to the question. Without having given the subject much thought or attention, I am inclined to favor location in such case by acreage, as in case of coal lands, exterior boundaries of claims to be vertical planes.

13. I cannot answer from knowledge.

14. I think it is possible, and not difficult.

15. Among others, Centennial mining district, Carbon County, Wyoming. By some 40 or 50 miners and prospectors, committee appointed to draft laws, to be presented at adjourned meeting. Officer, recorder elected by ballot; one book for record of lode and tunnel claims, one book for record of placer and ditch claims.

16. Posting notice, setting forth date of discovery, name of discoverer and claimant

or claimants, course and distance claimed each way from point of discovery, followed by sinking shaft 10 feet or more on vein, fixing exterior boundaries to claim of surface ground, and placing on record with district recorder.

17. In some districts rules allow six months within which developments may be prosecuted and survey be made, copy of which survey is put upon record as supplementary to former record. The course or strike of vein in first record is frequently given as easterly and westerly, northeasterly and southwesterly, &c., and in record of survey definitely fixed as N. 23° 40′ W., &c. I am not aware that any district rules presume to tolerate a change from original record, whereby could result infringements on claims made subsequent to first record and antecedent to survey of original locator.

18. Not within my knowledge, although I have been advised of such result in Utah. There is no security against such frauds, except the honor (?) of the recorder.

19. Emphatically yes, so far as district laws are concerned. That a decision of the United States Supreme Court as to the title of property worth $1,000,000 should turn upon what was at some particular time the whim of a majority of the prospectors and miners in any new camp seems absurd, yet such is the law. But as to record, no; I regard it as a matter of prime importance that record of mining claims be kept in mining districts, for convenient reference of miners and prospectors. It might be well, however, to require all district recorders to furnish transcripts, at stated intervals, to the register of the land office within whose land district the mineral district is situated of all mining records not previously returned, the transcripts to be recorded in the land office in a book kept for that purpose, and then returned to the recorder of the mining district, each transcript to bear the certificate of the register that it is recorded, and to be filed in the recorder's office. The same end might perhaps be more directly compassed by requiring the prospector or miner applying for record to present the instrument of writing which he wishes to have recorded in duplicate, deposit the register's fee for recording, which, with one of the duplicate copies, certified as correct copy, it shall be the duty of the recorder to forward to the land office. The form of the first instrument to be recorded should be uniform throughout the country and established by law.

20. Emphatically, no. I am opposed to all legislation which assigns to ministerial officers judicial functions, as I am to all legislation which assigns to judicial officers ministerial functions. Under our system of government every man who feels himself injured in person or property should not, in my judgment, be deprived by law of redress through the courts. I doubt the advisability of leaving other land claims in contested cases absolutely to the United States land officers, nor do I believe they are so left. The interposition of a court of equity may at any time be sought, nor upon a proper showing would it be denied.

21. I would do away with district laws and the authority of local customs entirely, and let the method of organizing districts, electing recorders, and keeping records, &c., be prescribed by statute. I would have all the conditions of tenure prior to patent and prerequisites for patent definitely fixed by statute, and the same for all mineral districts of the country, unless, for grave reasons, local differences should require some different rules; in which case the law and *locus* of application should be fixed by statute. As to following the dip beyond the side lines, suppose the dip 45°; following the dip 425 feet would pass the side line even at the maximum of 300 feet width. It would not seem advisable to me to stop progress to a greater depth, because the vertical side line is reached at such depth, the lower portion of vein being retained for outside locators, to be reached only on sinking 300 feet or more through unproductive ground. Upon allowance of greater width to original locators, still less advisable would such course be. In veins nearly horizontal, location by acreage, as before suggested, I think most desirable; and if such location be authorized the statute should prescribe the number of degrees in dip which shall be the line of demarkation between the two methods.

22. Yes; five years.

PLACER CLAIMS.

1. The proportion can scarcely be fixed, even approximately. The products of placers are gold and soda; the latter being in the form of crystallized sulphate.

2. Somewhat familiar through applications for patents for property in which I am interested mainly.

3. Reference to records of land office recommended.

5. Not from my knowledge so far as they are held for *bona-fide* purpose of mining.

6. The law, in my judgment, should not sanction title to town sites through placer-mine location.

7. I am not aware of such instance, unless it were at Leadville, Colo.

8. No.

9. I do not.

Very respectfully,

S. W. DOWNEY.

Testimony of A. T. Babbitt, cattle-grazier, Chegenne, Wyo.

The questions to which the following answers are given will be found on sheet facing page 1.

1. A. T. Babbitt, cattle-grazier, Cheyenne, Wyo.
2. Two years.
3. One quarter section; homestead and pre-emption.
6. I regard the desert-land act for application in this Territory impracticable, as in no location that I know of is it possible to irrigate the whole of a section of land. I think that the irrigation of say one-third should be required.
7. Pastoral, and so impossible of irrigation as to be unavailable for farming extensively.
8. I do not believe it at all practicable for graziers to do a successful business on the basis of owning and fencing the land. In this region of severe winds stock must "drift or die."

AGRICULTURE.

1. Rainfall limited practically to two or three months. Early summer. But about three months, say June to September, exempt from frost. Water for irrigation limited, and irrigable area in exceedingly small proportion.
2. Yes.
3. None.
4. Not to exceed one-fortieth.
5. Oats, and probably wheat. No corn. Potatoes and hardy vegetables.
6. Don't know.
7. In our section the Wyoming Black Hills.
10. As yet but a small proportion, and mainly by homestead and pre-emption.
11. Few or none.
12. Nearly all.
13. It is practicable, and a section or more should be allowed.
14. No. Yes.
15. Twenty-five to thirty.
18. Grazing has considerably reduced it.
19. They usually fence say 100 acres or more for pasture. I do not think they can safely confine stock in winter storms.
20. Yes, if it were safe.
21. Black Hills.
23. They destroy it if the land be at all heavily stocked.
24. No.
25. Cattle men respect one another's claims and rights. Sheep men are aggressive, and drive cattle men back.
27. I believe the grazing as at present on the public domain a decidedly greater public benefit than any sum possible of realization from sale of land, even if it were safe or practicable to buy and fence.
28. I think not.

Testimony of Stephen W. Downey, attorney and counselor-at-law and Delegate in Congress, Laramie City, Wyo.

LARAMIE CITY, WYO., *September* 25, 1879.

DEAR SIR: I have the honor to invite your attention to some phases of the matter of timber cutting upon the public domain, the laws inhibiting or regulating the same, the rulings and regulations of the Interior Department thereupon, and the effect of such laws, rulings, and regulations upon the industries and interests of the citizens of Wyoming Territory.

You are probably aware that Hon. Carl Schurz, Secretary of the Interior, has made the discovery and prevention of infractions of the law in this regard and the punishishment of offenders the object of special efforts.

From the studious and watchful zeal directed toward the conservation of the public forest wealth, as manifested by the edicts, agencies, and acts emanating from that department, have arisen grave apprehensions of unjust, oppressive, and impolitic exactions and restrictions upon the pursuits of our people, of which some appear to be without warrant in law, others not to have been contemplated by the national legislature upon the passage of the acts whose requirements are claimed to be enforced, and yet others to be clearly usurpations of the functions properly appertaining to the Navy Department.

In consideration of the latter fact I am specially led to make this communication to you, while having in view the general object of placing the matters herein considered before one or more of the Cabinet ministers in order that the fullest light may be shed upon the subject in case it should arise for the consideration or action of the Cabinet.

I solicit your special attention to those phases of the question involving issues assigned by law to the administration of your department.

All such questions relating to felling and removing timber from the public domain as are now at issue between our people and the Interior Department appear to have been originally referred by law to the discretion of the Secretary of the Navy. Subsequent legislation has effected a partial repeal of such law, making special regulations in certain specified States and Territories, assigning the details of these regulations to the Interior Department, the most recent of which legislation expressly announced the repeal of former law only so far as relates to the specified States and Territories, thereby reaffirming the full force of the old statute as to all other States and Territories.

In order to a full statement and exposition of the case as regards the letter and spirit of the law, official action to be taken, and official discretion to be exercised, it will be necessary to advert to the provisions of the old statutes bearing upon the issue, to the provisions of subsequent legislation effecting modifications or partial repeal of the same, to the imperative wants of the people essential to civilized existence in Wyoming Territory, together with their sources of supply, and to the spirit of the laws and of the administration thereof by the government in the past, uniformly fostering the exploration, settlement, and development of resources of the remote and unoccupied portions of the public domain.

By act of Congress, approved March 1, 1817, sections 2458 and 2459, Revised Statutes, the Secretary of the Navy is authorized to select, and the President to reserve from future sales, public lands producing live oak and red cedar, to be appropriated to the sole purpose of supplying timber for the Navy of the United States. Other sections of the same act provided for punishment of trespass upon timber thus reserved.

By act approved February 23, 1822, the President is authorized to use the land and naval forces of the United States to prevent the destruction and removal of timber in the State of Florida, then public unorganized territory.

By act approved March 2, 1831, entitled "An act to provide for the punishment of offenses committed in cutting, destroying, or removing live-oak and other timber or trees reserved for naval purposes," it is provided in section 1 in the most definite, sweeping, and comprehensive language that certain fines and penalties shall be imposed upon any person convicted, first, of cutting or wantonly destroying, or aiding or procuring to be cut or wantonly destroyed any live-oak, red cedar, or other timber reserved pursuant to law for the use of the Navy; second, of removing or aiding or procuring to be removed such timber so reserved without competent written authority, and for the use of the Navy; third, of cutting or removing or of aiding or procuring to be cut or removed any such timber upon other lands of the United States with intent to dispose of, use, or employ the same for any other purpose whatever other than for the use of the Navy. It is further provided in section 2 of the same act that any vessel seized, having on board such timber so cut and removed for the purpose of transportation, with the knowledge of the master, owner, or consignee, shall be wholly forfeited to the United States; and that the master of the vessel wherein such timber has been exported to any foreign country shall be fined not less than $1,000. The first and second sections of this act appear as sections 2461 and 2462 in the Revised Statutes; the third section of the same act appears as section 4751 in the Revised Statutes, the words "the Secretary of the Navy" being substituted in the Revised Statutes for the words "the commissioners of the Navy pension fund," the Secretary of the Navy having been made "trustee of the Navy pension fund" by act approved July 10, 1832.

Section 4751 Revised Statutes substantially the same, except the substitution above recounted, as section 3 in original act of March 2, 1831, is, in full, as follows, viz:

"All penalties and forfeitures incurred under the provisions of sections 2461, 2462, and 2463, title 'The Public Lands,' shall be sued for, recovered, distributed, and accounted for under the directions of the Secretary of the Navy, and shall be paid over one-half to the informers, if any, or captors where seized, and the other half to the Secretary of the Navy for the use of the Navy pension fund; and the Secretary is authorized to mitigate in whole or in part, on such terms and conditions as he deems proper, by an order in writing, any fine, penalty, or forfeiture so incurred."

This act seems designed to be a substitute, in a great measure, for the act above referred to, approved March 1, 1817, except as to the first two sections of that act still retained in section 2458 and 2459 Revised Statutes.

Before proceeding to subsequent legislation affecting the provisions of the later act or restricting their application I desire to comment briefly upon it, because it is that under which, by the rulings of the Interior Department, the main issue between certain officers and agents of that department and the people of Wyoming has been raised.

It appears evident from the text that the act was designed to punish trespass upon the public timber lands, so far as thereby the sources of supply for the anticipated wants of the Navy might be abridged, and for no other purpose; and that the Secretary of the Navy (originally the commissioners of the Navy pension fund) should be the sole judge of such abridgment, and exercise sole discretion as to what or whether any prosecutions should be instituted under the provisions of the act.

That the institution of proceedings against offenders by officers or agents of the Post-Office Department, of the War Department, or of the Interior Department, or any otherwise, except by and under the directions of the Secretary of the Navy, was ever contemplated seems absurd when it is considered that the Secretary of the Navy, in whom alone the law, by express provision, fixes the power to direct such proceedings, has also the power, by equally express provisions, to mitigate, in part or in whole, any penalty, forfeiture, or fine incurred.

The supposition that this statutory law contemplated any vindication through the agency of the Secretary of the Interior, is sufficiently answered by the fact that the office of the Secretary of the Interior had not been created and did not exist at the time of the passage of said act.

The supposition that the powers and discretion given by the act to the Secretary of the Navy would have been given to the Secretary of the Interior, had such office then existed, is sufficiently answered by the fact that the office of Commissioner of the General Land Office was created in 1812, prior to the passage not only of the act of 1831 but also of the act of 1817, with powers and duties similar to those now pertaining to said Commissioner, but then in the Treasury Department, and to this officer or to the head of his department would have been assigned the discretion given to the Secretary of the Navy had the national legislature contemplated such interpretation of the law as is now sought to be put upon it by the Secretary of the Interior.

The substance and strength of the law is the will of the enacting legislature. If the body of the act under consideration leaves any doubt as to the purpose of its passage, the title seems to set all doubt at rest: "An act to provide for the punishment of offenses committed in cutting, destroying, or removing live-oak and other timber or trees reserved for naval purposes."

The grants made to the various divisions of the Pacific Railroad system rendered section 2461 Revised Statutes inoperative, so far as concerned timber procured for the construction of said roads.

By act approved June 3, 1878, entitled "An act for the sale of timber lands in the States of California, Oregon, Nevada, and in Washington Territory" sales of timber lands are authorized under certain regulations, and section 4751 rendered inoperative in the States and Territory named.

By act also approved June 3, 1878, entitled "An act authorizing the citizens of Colorado, Nevada, and the Territories to fell and remove timber on the public domain for mining and domestic purposes," section 4751 Revised Statutes, seems to have been rendered inoperative by implication, though not expressly, as to all mineral lands in the States of Colorado and Nevada, and in the Territories of New Mexico, Arizona, Utah, Wyoming, Dakota, Idaho, and Montana applying to all persons except railroad corporations, Nevada alone receiving the benefits or burdens, whichever it be, of both acts approved June 3, 1878.

Railroad corporations being expressly excluded from the provisions of the latter act, if such exclusion be constitutional, are necessarily excluded from the provisions of the third section, as well as of the first and second sections, and as to such corporations sections 2461 and 4751 Revised Statutes would still be in force, both upon mineral and non-mineral lands. Therefore, if I am right in my conclusions above in regard to the construction of those two sections, actions against railroad corporations for taking timber from the public domain in Wyoming Territory for the construction or maintenance of their roads can legally be instituted by and under the directions of the Secretary of the Navy alone.

In speaking of the act approved June 3, 1878, I shall refer to the one named second in order above, that being the one which applies to Wyoming.

In the "Rules and regulations prescribed by the Secretary of the Interior" pursuant to said act, in a circular issued from the Department of the Interior, General Land Office, dated August 15, 1878, the Secretary, among other things preliminary to the rules, says: "To the end that the mountain sides may not be left denuded and barren of the timber and undergrowth necessary to prevent the precipitation of the rainfall and melting snows in floods upon the fertile arable lands in the valleys below, thus destroying the agricultural and pasturage interests of the mineral and mountainous portion of the country," &c. (See circular.)

However solicitous the Secretary may be to guard the interests of the agriculturists and herdsmen of Wyoming against the fatal consequences of their own vandalism, and however reasonable such a setting forth of the grounds and cause of action may be, applied to other regions, it seems absurd in its application to Wyoming, the great body of whose lands, by the decision of the same Interior Department, rendered prior

to the issuance of said circular, have been held to be "desert lands" within the meaning of the "desert-land act," approved March 3, 1877. Yet Wyoming alone, of all the eastern slope of the Rocky Mountains, has been chosen by the department as the field of active operations for the repression of timber cutting upon the public domain.

The first rule in said circular announces that section 2461, Revised Statutes, is still in force, and that trespassers upon lands not mineral "will be prosecuted under said section." Under whose directions will they be prosecuted? Is the Secretary of the Interior the mouth-piece by which the discretion of the Secretary of the Navy is to be promulgated? If section 2461 is in force in Wyoming as to all lands not mineral, section 4751 is also in equal force, there being nothing in the act of June 3 to the contrary. Yet under such rulings, through officers or agents of the Interior Department, a demand has been made upon railroad-tie manufacturers, lumber manufacturers, and wood dealers for a fine, forfeiture, or stumpage tax for timber taken from the public domain, or alleged to have been so taken, prior to June 3, 1878. Through the same agency a demand has been made upon lumber manufacturers for a sworn statement of the extent of trespass by them committed, as a basis for compounding the offense, accompanied by intimations or menaces of some undefined evil to befall upon neglect or refusal to furnish such statement; all of which demands, as well as settlements made pursuant to acquiescence therein, and by officers or agents of the Interior Department, I claim to be without warrant in law.

Through the same agency an order has been served upon tie makers, lumber manufacturers, and wood dealers in Wyoming, inhibiting all further cutting or removal of timber, of whatever character or dimensions, from the public lands by them, whether such lands be mineral or non-mineral, and whether such timber be dead or alive. With this order of inhibition has been announced the adoption as a rule of action of the principle that the wood dealer, lumber manufacturer, and tie maker is each barred from the pursuit of his vocation by the act approved June 3, 1878—*i. e.*, that John Doe being a merchant may shoulder his axe, go and cut from the public forest such timber as he may need for fuel, fencing, and buildings, provided the same, dead or alive, be not less than eight inches in diameter, or that he may hire the same to be done for him, provided the mediate agent be not a wood dealer or lumber manufacturer; but that Richard Roe, a wood dealer, or Henry Jones, a lumber manufacturer, may not anticipate the wants of John Doe and prepare to supply his wants on demand, because this would savor of speculation. Such ruling and action based thereupon I claim never to have been contemplated by the national legislature upon the passage of the act. All organized and systematic business is speculative so far as it is based upon anticipated want. The more accurate anticipations of want are, the more successful will business be. Such a departure from this principle as the ruling above stated enjoins is a return toward the primeval and barbarous state, in which each man must provide for his own wants by the labor and skill of his own hands. I do not know whether or not the agent of the department has transcended his instructions in announcing this absurd principle and acting upon it, but I do know that the industries mentioned are at a dead standstill, checked by the order referred to, and this with the knowledge of the Commissioner of the General Land Office. At the same time no ban is laid upon similar pursuits in the State of Colorado, just south of us. If any credence can be placed in the public journals, a dozen or more saw-mills have been put in operation within a year in the vicinity of Leadville, all manufacturing lumber from timber taken from the public domain. Homes are warmed, food prepared, and ores reduced there by fuel taken from the public forests, furnished in whole or in part by wood dealers and lumber manufacturers pursuing their vocation. Can it be that these operations carried on there, where are operating alert capitalists from San Francisco, New York, and London, are less speculative than here, where lumber manufacturing has been, and but for the present ban put upon it would now be, carried on to a limited extent, and exclusively to supply the ordinary home demand? Whatever the general and ultimate rights of the issue, such discrimination against Wyoming as between it and Colorado cannot be justified.

I do not institute this comparison desiring Colorado to be placed under the same ban. On the contrary, I believe the privileges and immunities there accorded and enjoyed to be in full harmony with the letter and spirit of the law.

Colorado has made great and praiseworthy progress within the past fifteen years, adding much to the credit and wealth of the nation; a progress which would have been utterly impossible without, and is largely due to, repeated and constant violations of the inhibitions of section 2461 of the Revised Statutes, according to the interpretation of those inhibitions by the Department of the Interior. Many of the mineral products of Gilpin County, the first great mining center, could not be utilized on account of their refractory nature until the inauguration and successful operation of the Boston and Colorado Company's Smelting Works, at Black Hawk, by Professor N. P. Hill, now United States Senator from that State. These works probably did more to establish the worth of Colorado minerals and the success of Colorado mining, and consumed more fuel procured through violation of the inhibitions of section 2461 of

the Revised Statutes, than any three other reduction works of Colorado. Nine-tenths of all the stamp-mills or other reduction works have been run by steam power, and the fuel procured in the same way. Nine-tenths, probably ninety-nine hundredths, of all the buildings erected prior to June 3, 1878, were constructed wholly or in part of lumber obtained by the same violation. To say that such use of the timber upon the public domain was not contemplated, and was wrong and criminal, is to say that the progress made in the development of the resources of Colorado, the growth in wealth, the increase in population, the establishment of homes, the founding of institutions of learning, and the building of churches were not contemplated, and were wrong and criminal. Yet all this has been carried on for the last fifteen years, under the eye and with the full knowledge and consent of Congressmen, Senators, Cabinet ministers, Vice-Presidents, and the President of the United States, who have from time to time visited Colorado. With none of these industries, none of this progress, none of this settlement and increase of population, the timber of Colorado might as well have been put in the moon, so far as any value it would have possessed to the United States government or anybody else. It was valuable precisely for the use to which it has been devoted, and for no other use.

The timber of Wyoming is valuable alone for use within Wyoming, or in regions immediately adjacent thereto, and sinks in value as that use is obstructed.

It is a fact greatly to be regretted that far more timber is annually blasted and destroyed by the ravages of forest fires than is cut up for use for all purposes to which it is devoted. While I write a fire is raging in the Medicine Bow Mountains, some thirty-five or forty miles to the west of Laramie City, which has already swept through thousands of acres of the heaviest timber, enveloping a region of more than 1,000 square miles in dense clouds of smoke. The trees thus destroyed in a few weeks would have kept all the lumber manufacturers, tie makers, and wood dealers in this portion of the Territory occupied for years in supplying the demands of the people, while they, upon the order of the agent of the Interior Department, are standing idly by, witnessing the destruction by conflagration of what they are not permitted to devote by their industry to the uses for which it is chiefly valuable. Such forest fires are of almost annual occurrence. In many cases the limitation of their spread is dependent upon the presence of timbermen, who, when present, are able to take advantage of glades and cut off the progress of the flames. I am informed by Mr. C. H. Bussard, who has been one of the leading tie manufacturers in this region, that if he had been engaged, with his usual number of employés, in the region of the present fire, he could have checked it before extensive damage could have been done.

The idea, more or less prevalent in the East, that tie-making and lumber manufacturing in the Rocky Mountains is a kind of royal road to wealth, is altogether a mistake. Few engaging in such pursuits gain more than a livelihood; as many fail utterly; and, like the majority of their patrons engaged in other pursuits, they have nothing to depend upon but their industry and energies. With few exceptions, we are all struggling along on the ragged edge of poverty for an existence; a condition not by any means unique or unusual in new and sparsely settled regions. We are surrounded by many varied and extensive resources, teeming with the germs of future wealth, but yet mainly undeveloped, and we are without the means for present development. We need the *fostering*, not the *repressive*, hand of government.

If section 2461, Revised Statutes, is to be construed strictly as maintained by the Interior Department, many high officers of the government, upon impartial prosecution, would fall under like condemnation as the citizens of Wyoming. The War Department has violated and continues to violate, in the most marked and open manner, its inhibitions. In Wyoming alone, there are some ten or eleven military forts, constructed wholly or in part of timber felled and removed in violation of those inhibitions. The forts which are or have been occupied have been or still are supplied with fuel by contractors—violators of the same inhibitions. It is no answer to say that such employment of timber is for government use, for the language of the statute is: "If any person shall cut, or cause or procure to be cut, or aid, assist, or be employed in cutting, any live oak, or red cedar trees, or other timber on, or shall remove, or cause or procure to be removed, or aid or assist or be employed in removing, any live oak or red cedar trees or other timber, from any other lands of the United States, acquired or hereafter to be acquired, with intent to export, dispose of, use or employ the same in any manner whatsoever other than for the use of the Navy of the United States, every such person," &c., &c. The building and heating of a United States military fort upon the plains is certainly an employment other than for the use of the United States Navy. Upon a strict construction any person, be he Secretary of War or General of the Army, who cuts, or removes, or causes or procures to be cut or removed from the public domain timber for the use of such forts is obnoxious to all the penalties imposed by the statutes as much as the humblest squatter who constructs his rude hut or cabin. An officer of the government, even the President himself, has no more right to violate law and do an act therein characterized as felony than has a private citizen. The War Department is not alone in the condemnation.

The judges of the United States courts, the United States attorneys, United States marshals, registers and receivers, and special agents of the Interior Department are all sheltered by roofs and warmed by hearths supplied by violation of the said inhibitions. The very exclusiveness of the use reserved in the act of March 2, 1831, no provision being made for any other department of the government, tends to establish the interpretation of the act which I first gave above, and confirms the ruling that what fines or penalties, or whether any, shall follow infractions of said inhibitions rests wholly with the discretion of the Secretary of the Navy, and that the exercise of that discretion should depend upon whether or not sources of supply for the anticipated wants of the Navy have suffered abridgment.

To encourage the development of latent resources, the increase of immigration, and the expansion of civilization the government has wisely sanctioned the most unrestrained use of its agricultural resources, its water supply, and its mineral wealth. It is difficult to see upon what principle pioneer citizens should be restrained from enjoying the ample timber resources to the extent required for domestic purposes. Mineral wealth, once exhausted, offers no hope of restoration by reproduction where exhausted. Quite the contrary is it with timber wealth. Portions of timber land in Colorado, entirely denuded in the early days, are now covered by a fine growth of promising young trees. The timber of Wyoming would not be exhausted by the uses of the people in ten generations. Cut it all off, and it will be replaced in three or four generations by natural growth.

I have alluded incidentally to the use of timber for railroad purposes. A few words directly to that subject: The government thought it expedient, in order to secure the construction of the Union Pacific road, not only to devote all necessary timber from the public lands to that purpose, but also to subsidize the enterprise by other grants of large proportions. Is the maintenance of the road, with the increased facilities of communication which it has brought, and the consequent arrangement and ordering of commercial transportation, of less importance to the government and the people than the construction? Where, if not from the public domain, shall ties be obtained? Would it be the exercise of a wise discretion to compel their purchase from the Alleghany Mountains and transportation to Wyoming to keep up a road-bed along or near the forests here? All cutting of ties upon any terms from public lands in Wyoming is at present banned by order emanating from the Interior Department, whether with or without warrant of law. Should the question come for decision to the Secretary of the Navy, where I think the law clearly places it, as I have before indicated, would absolute prohibition upon any and all terms be discreet governmental policy? The United States has an important, direct interest in the economical and successful operation of the Union Pacific Railroad, which both justice and discretion dictate should be permitted, on some reasonable terms, to procure ties from the forests of Wyoming. Some portions of the timber lands are within railroad limits, and where these are yet unsurveyed the company, under present rulings, is practically barred from its own as well as from government lands. At the same time a large amount of fuel has been taken from railroad lands, both for private and government use, and no objection has been made by the company. In view of these facts the prohibition now sought to be put in force seems impolitic, and can scarcely be characterized as magnanimous.

The act of June 3, 1878, is objectionable even with the most liberal construction. That agriculturists and denizens of towns adjacent to timber growing on mineral lands should be accommodated with all necessary timber for fuel, building, and other domestic purposes, while similar classes adjacent to timber growing on non-mineral lands should be debarred from like privilege, is not based upon any fair, sound doctrine. In the first section of the act the words "said lands being mineral and not subject to entry under existing laws of the United States, except for mineral entry," should have been omitted; and in the second section the word "mineral," before the word "land," should have been "timber." The act is faulty in other respects, chiefly in its uncertainty and in the possible susceptibility of the interpretation which has been put upon it. The faults in the text of the act are, however, as a matter of course chargeable only to the enacting legislature, and it is to be hoped will be remedied at the next session of Congress either by amendment or repeal of the present and the enactment of a better statute.

During the late extra session of Congress, at an interview with the Secretary of the Interior, I represented to him the matters and facts herein considered pretty fully, bringing to his attention many points from this omitted, at the same time presenting a written request for his reconsideration of certain features of the "rules and regulations" promulgated from his department, stating in what particulars changes seemed desirable, and giving reasons therefor.

The features which, according to the announced instructions of the special agent of the department in Wyoming, would work evil to the citizens and which are especially complained of are: First, the prohibition of all persons from felling or removing all timber, dead or alive, less than eight inches in diameter; and second, the prohibition of mediate operators, such as lumber manufacturers, wood dealers, &c., from prosecuting

their vocations for supplying the citizens of the Territory by felling and removing timber for building and other domestic purposes.

The grounds of complaint of the first feature are, that there are immense tracts of dead timber, suitable for fuel and fencing, less than 8 inches in diameter which is passing into decay; that thousands of acres of land have been taken up by actual settlers, through pre-emption, homesteading, under the desert-land act or otherwise, which lands have no timber for fencing or building. Settlers upon these lands have had recourse to the mountain forests for building timber and fencing poles. These settlers must fence their claims or abandon them. A prohibition of the privilege of obtaining fencing poles, whatever the design, results practically as bad faith on the part of the government. The fencing poles ordinarily obtained and used range from 4 to 7 inches in diameter, averaging about 5½. Trees of such size, for such use, are more valuable than those of larger size.

Acts of Congress and rulings of governmental departments cannot alter established principles of political economy, among which none is more generally acknowledged and none more readily commends itself to quick discomment than the policy of reasonable assortment and division of labor. The average settler does not transport a saw-mill among his chattels. He must purchase the lumber for his dwelling from him whose regular occupation is that of a lumber manufacturer. The average baker is not an axman, he must purchase his fuel from the woodman or collier. I have already remarked upon this feature of the ruling, and need not enlarge upon it.

At the same interview with the Secretary, I asked and received a promise that, whatever course he decided upon in regard to the general, ultimate issue, no action should be taken or restrictive measures instituted against the citizens of Wyoming that were not also taken or instituted against the citizens of other Territories and States where the same laws are in force. According to my recollection, Hon. N. P. Hill, United States Senator, and Hon. J. B. Belford, Representative of Colorado; Hon. Martin Maginnis, Delegate from Montana, and other gentlemen were present and participated in the interview. About the same time I had an interview with Hon. Edgar M. Marble, Assistant Attorney-General, Department of the Interior, and several interviews with Hon. J. A. Williamson, Commissioner of the General Land Office, upon the same subject. I refer to these several interviews here merely to show that I took what I conceived to be proper and reasonable steps to avert impolitic and oppressive restraint menacing the industries of our people by a fair presentation of the case to the department moving for such restraint before making any appeal to you or to the Cabinet generally. The result of my efforts, both as to promises secured and subsequent action, is shown in the foregoing pages.

It is not my purpose to assail herein the sincerity of the honorable Secretary or of any officer or agent of the Interior Department. I am prone to believe the action above set forth to be the consequence of a misconception of the real merits of the case, but on that account none the less ill-advised and impolitic, and in effect upon the citizens of Wyoming none the less unjust and oppressive.

I therefore ask, in behalf of the people whom I represent, a candid consideration by you of the letter and spirit of the laws, and of the facts and issues which I have presented, and that you take such official action, as head of the Navy Department and as Cabinet minister, for the relief of the citizens of Wyoming from their present distress as the laws and facts in the case and the history and philosophy of the spread and development of civilization in the country shall seem to warrant.

If the interpretation which I have put upon the act of March 2, 1831, sections 2461, 2462, and 4751, Revised Statutes, seems to you just, reasonable, and conducive to the growth, development, and general prosperity of the regions adjacent to the timber lands of Wyoming, where alone such timber is valuable, and to which growth and development it is naturally tributary, I ask that, in the capacity of Secretary of the Navy, you signify in some effective manner the retention and exercise of the lawful functions of your office to the prevention of usurpations of the same by officers or agents of the Interior Department, and that you so exercise the discretion given you in said act as to foster the prosperity of this region.

If the interpretation of the act approved June 3, 1878, by the Interior Department seems inconsistent with the purpose of the national legislature upon its passage, and not conducive to the interests of the people for whose benefit it was passed, I ask that, in the capacity of Cabinet minister, you use reasonable efforts to secure a modification of the interpretation and rulings and orders based thereupon.

Finally, I ask, as a courtesy, that you communicate to me, at as early a day as practicable, your views and proposed action, if any, upon the matters herein submitted.

I have the honor to remain, with much respect, sincerely yours,

S. W. DOWNEY.

Hon. R. W. THOMPSON,
Secretary of the Navy, Washington, D. C.

Testimony of George Ferris, stock raiser, Fort Steele, Carbon County, Wyoming.

The questions to which the following answers are given will be found on sheet facing page 1.

FORT STEELE, CARBON COUNTY, WYOMING,
November 19, 1879.

RESPECTED SIR: Your circular with questions in regard to the public domain has been carefully read, and herewith find a few answers:

1. George Ferris, on Platte River, 12 miles below Fort Steele; stock raising.
2. Fourteen years.
3. Have sought to acquire title to land, but price was too high; land is not surveyed.

AGRICULTURE.

1. Climate dry and cold; rainfall very light; length of seasons five months; snowfall light in the lower valleys, heavy in the mountains, very often 10 feet in depth; supply of water is ample in most of the valleys.
2. Rainfall mostly in May and June and very limited; high waters in May and June.
3. There are no crops raised here without irrigation.
4. Farming will always be very limited in the southern and middle portions of the county.
5. Wheat, barley, oats, and most of the hardy vegetables.
6. Have not had any experience in irrigation.
7. Platte River and its tributaries.
10. But little water utilized.
12. Nearly all is pastoral lands.
13. It is, in amounts not to exceed 10,000 acres.
14. It should be limited to 10,000 acres, and such laws passed as to prevent parties from acquiring title to more than the amount stated. The law should be so enacted that in case parties fell heir to lands, thereby giving them an excess of 10,000 acres, the excess should be sold within one year's time.
15. Twenty-five acres.
16. Four hundred head.
17. Have no idea.
18. But little changed.
19. But little fencing. Yes.
20. Yes.
21. Platte River and its tributaries.
24. No.
26. Cattle 50 to 20,000; sheep up to 3,000.
28. But little surveyed land at present date.

Yours, respectfully,

GEO. FERRIS.

Testimony of Edward Ivinson, president Wyoming National Bank, Laramie City, Wyo.

LARAMIE CITY, WYO., *November* 13, 1879.

Hon. THOMAS DONALDSON, *Public Land Commissioner, Washington, D. C.:*

Your circular sent out under letter dated September 16, 1879, reached me sometime since. Upon careful consideration of questions therein presented, to which answers are severally required, and in view of the limited practical experience which I have had in other fields of industry, I have decided to confine my replies to the timber business, answering in order to the questions presented in circular.

1. The plain lands are almost entirely devoid of timber, while the mountainous districts are in the main well timbered, principally with evergreen trees, consisting of pine, spruce, fir, hemlock, and cedar; with aspen, cottonwood, and willow in the lower gulches, and being of slower growth than the timber in regions less elevated above sea-level. The percentage of choice lumber produced is very small, not because it is less durable than eastern lumber of the same woods, but because more knotty, windier in grain, and hence less susceptible of fine finish. For floors of bridges, stores, uncarpeted public offices, bar-rooms, &c., native flooring is said to outwear eastern flooring, even walnut and ash.
2. Few trees have been planted in this Territory, except for ornamental and shade trees, and these are for the most part native forest trees.
3. In my judgment the government timber lands of the Rocky Mountain region should not be disposed of to purchasers at the present time, but should be held by the

government for the use of settlers upon agricultural lands as required by them, as inducements to settle and improve adjacent regions, which lack many attractions possessed by eastern prairie lands, and present to settlers many asperities from which more eastern regions are free. Strictly clear lumber, as before intimated, is produced here only in very limited quantities, large quantities of eastern lumber being imported for the use of our people. Exportation of the Rocky Mountain lumber is impracticable from the fact that there is no demand for it abroad at the necessary cost of manufacture here, increased by cost of transportation. It is therefore only available for the use of settlers in the regions near the mountain forests, and for the industries and enterprises in which they are engaged. A division or parceling of the timber lands among the settlers, by grant, purchase, or otherwise is impracticable, the timber being aggregated in large tracts at an average distance of probably twenty-five miles from settlers' homes, precluding that constant supervision essential to the protection of individual property rights in newly and sparsely settled regions. Parties engaged in the mining and reduction of ores, and settlers on tracts immediately adjacent to timber lands, would have inducements to purchase in small lots. Apart from these, except for speculative purposes, there are practically no inducements to purchase timber lands. Regulations for parceling and selling would foster just the speculations which the Interior Department professes to have been guarding against during the past year. If the government determines upon allowing no timber to be used from the public domain without the return of revenue, some discreet regulations for the payment of royalty would, in my opinion, be more conducive to the interests of the government, and of the people in this region, than any regulations for the parceling or sale of lands.

4. No; not so far as Wyoming is concerned, but if the government determines upon selling the timber lands, a close classification of timber lands, both as to character and quality of timber and as to the amount borne per acre, would be not only expedient but necessary to an equitable disposal.

5. There is a second and thrifty growth both in districts burned over and in those chopped off. Could fires be stopped entirely the timber would be sufficient to last for the ordinary purposes of the region for ten generations. Cut it all off and it would be restored by spontaneous growth in three or four generations.

6. The origin of forest fires is difficult to ascertain in many cases. Very extensive fires in Northern Colorado this season have been started by the Ute Indians, destroying more timber probably than has been cut in Wyoming since its first settlement for all the ordinary uses of civilized life. Other very destructive fires are kindled through the wanton vandalism or culpable negligence of tramps, hunters, and travelers; yet others are started by lightning flashes. The timber annually used is probably not ten per cent. of that annually destroyed by fire. In my judgment heavy penalties should be imposed by law upon any person who starts a forest fire even by culpable neglect. Proof of guilt would be difficult, but a few examples upon clear proof would have a salutary effect in deterring others from the commission of similar offenses.

7. Depredations for the uses of life, amounting to infractions of law, have, in my opinion, been made very rarely if at all in this part of the country. Section 2461 of the United States Revised Statutes, under the provisions of which it is proposed by officers of the Interior Department to punish depredators, seems to be better remembered than section 4751, which is part of the same act of Congress, approved March 2, 1831, entitled "An act to provide for the punishment of offenses committed in cutting, destroying, or removing live oak and other timber or trees reserved for naval purposes." The last-named section provides that no suit shall be brought for fines, penalties, and forfeitures incurred under section 2461, and other sections of the same act of Congress, except under the direction of the Secretary of the Navy, who is expressly authorized to mitigate, in whole or in part, fines, forfeitures, and penalties so incurred. At the time of the passage of the said act the Interior Department had not been created, but the office of Commissioner of the General Land Office had been created in 1812, with similar functions to those now pertaining to that office, being then a bureau of the Treasury Department. To the Commissioner of the General Land Office would have been given the discretion upon timber depredations and the punishment thereof, by the said act of Congress, instead of to the Secretary of the Navy, if the view now promulgated by the Interior Department had then obtained with the Congress that enacted the law. The Rocky Mountain timber regions were scarcely known at the time of the passage of the act in question, but the live oak and red cedar timber of the Gulf region were suffering depredations by speculators, and the evident design of the act was to punish infractions so far, and only so far, as the same should deplete the sources of supply for the anticipated wants of the Navy. Unless it can be shown that the timber here used in the building of homes, in the fencing of farms, and the supply of fuel (the two latter being taken mainly from the dead timber), has cut short the sources of supply for the anticipated wants of the Navy, I am not aware of infractions of law through forest depredations for the uses of civilized life. No legislation, in my judgment, is necessary to prevent such use of timber. On the contrary, it should be

as free as the grass on the plains for the fattening of herds, the water of the streams for refreshing the soil, and the mountain elk for food.

8. The custom is to cut and use such timber from the forests of the public domain as is required for building, mining, fencing, and other industrial pursuits. The same opinion obtains relative to the ownership of felled timber as is held in regard to gold taken from placer ground, quartz from lodes, grass cut from plains converted into hay for sale to the government, and others, to wit: that it is and of right ought to be the property of him whose industry has created the value. The business of tie-making, lumber manufacturing, wood-chopping and the delivery of same to consumers in this Rocky Mountain region, are no royal roads to wealth, but constitute some of the few fields of enterprise upon which industrious pioneers can win a livelihood. Their relation to the general government is not unlike that of the self-exiled passengers of the Mayflower to the home government of England when they stood amid the primeval forests of Massachusetts. The British King and court of London then held as eminent domain over those forests as the American President and Cabinet at Washington now hold over the forests of Wyoming. Had the same ban there and then been put upon the woodman's ax that seeks to guard our forests here, the fathers of American liberty would have found therein graver cause for rebellion than is recorded in the pages of history.

9. The enforcement of restrictive laws upon the use of timber on the public domain, except in maritime parts of the country, would seem to pertain to the Department of the Interior, rather than to the Department of the Navy; if indeed such laws and their enforcement are deemed politic. Believing such restrictions to be impolitic, unjust, unnecessary, and oppressive, and in their rigid enforcement certain to result in the restriction of the settlement, growth, development, and prosperity of regions adjacent to the Rocky Mountain timber lands, where and for which this timber is alone valuable, I should regard the least rigid enforcement of such restrictive laws as the most desirable administration.

With much respect, your obedient servant,

EDWARD IVINSON,
President Wyoming National Bank.

Testimony of E. Nagle, merchant, Cheyenne, Wyo.

HON. COMMISSIONER PUBLIC LAND OFFICE,
Interior Department, Washington City, D. C.:

DEAR SIR: Inclosed circular handed me through Hon. Thomas Sturgis, this city, with request to reply. Hereto I have the honor to attach answers in part, applicable to pastoral land embraced in the southeastern portion of Wyoming Territory.

Very respectfully, yours,

E. NAGLE.

AGRICULTURE.

3. None.

4. Not sufficient water to cultivate over one acre to each 100 acres.

5. Nothing excepting hay and a few early vegetables.

7. Limited supply of water in this county for irrigation, excepting a few miles on the Laramie River and North Platte.

10. Very little land taken up in this country; none for cultivation excepting for hay lands.

12. Nine-tenths, exclusive of the timber and mineral land.

13. It is not practicable to locate homestead or pre-emptions on these lands except for grazing purposes. Any pre-emption granted should grant at least 25 acres of land to each head of cattle the pre-emptor may own, with privilege to pre-empt extra for the increase of his herd. His taxable number would not give land enough from the fact that property is not taxed over 60 per cent. of its number or value in this section. If pre-empted he should be allowed to pre-empt 25 acres per head he may actually own and have on the land at time of filing his intentions, and also 15 to 25 acres per head as a limit to his right to increase his herd. The price must be nominal, with a reasonable time allowed for the taking up of his location and patent for the land. The cattle business will not admit of high-priced land, and it is doubtful if it can be successful on all sections at any price if title is granted for nothing.

14. It will be disastrous to the cattle interest and the Territory to put these lands into market excepting to actual occupants, and then should be limited to the number of head of cattle, sheep, or horses he may actually own or have in his control.

15. This can be answered indefinitely only. Reason: that pre-emptors or locators will probably be required to locate in solid tracts that he may now be grazing upon;

for instance, a person owns 50 head of cattle and has a right to locate 25 acres per head, this makes but 1,250 acres, which if taken on valley or bottom land, he will get, say one-half of choice grass lands, while a party owning 5,000 head, at 25 acres per head, gives 125,000, and may not get 500 acres of choice bottom grass lands and several thousand acres which is of no value at all for any purpose whatever. I fix the entire county on a basis of 25 acres per head, while the best grass or meadow lands, which is limited, will not require over 10 acres. But the millions of acres of upland are of no value unless a portion of bottom lands can accompany them for hay purposes.

18. Grass is diminishing by grazing and tramping of stock.

19. Do not fence. It will be an experiment to fence the cattle ranges. Opinions differ in regard to fencing. Locations are different; some can fence without fear of loss, while others will probably prove fatal.

20. Herds will be improved from the fact that it will be the best interest of the grower.

21. Limited; large tracts are too far from water to graze on.

24. Sheep and cattle will not graze on the same lands at the same time.

27. I deem it to the best interest of the stock growers at present for the lands to remain as they are; but if the government desires to part with the title to these lands they should be sold at very low price—say 5 cents per acre—to actual occupants only or by pre-emption, allowing each occupant to locate his present range as near as possible, conflicting rights or disputes to be settled by the land office; a law compelling locators to join fence and pay each their equitable proportion; no damages to be allowed for trespass during storms in winter; the lands taken by sections where surveyed in direction and location as his present ranch or claim; the surveyor-general of the Territory to set aside what is to be classed as timber and mineral lands from the pastoral lands where the lands are surveyed; where unsurveyed, they to be classed by the surveyors at the time of making the surveys.

If the government desires to derive revenue only, then allow occupants to locate the same as by pre-emption, giving them the privilege to pay for same at a set price or pay an annual rental per acre, giving a lease for not less than fifteen years or over twenty years.

I think the most equitable mode of rental will be to tax each person so much annually per head for cattle running at large on the public domain; at the same time extend the right to location or pre-emption to those who may choose to avail themselves of the privilege to purchase.

Timber lands should never be sold in any manner; title should remain with the government and give away or sell the timber to occupants of the Territory only.

Testimony of William K. Sloan, mining, smelting, charcoal, and lumber manufacturer, Hilliard, Uintah County, Wyoming.

The questions to which the following answers are given will be found on sheet facing page 1.

1. Wm. K. Sloan, Hilliard, Uintah County, Wyoming; mining, smelting, charcoal, and lumber manufacturer.

2. Seven years.

3. I have. By pre-emption and under the desert-land act.

5. Have had no difficulty in procuring title to my land.

7. The conformation of this county is hilly in the central and eastern portions and mountainous in the northern and southern parts; principally pastoral in the central, interspersed with coal fields; in the north and south parts a stunted growth of timber; in the mountains mineral in small quantities has been discovered in nearly all the mountain ranges; the agricultural portion is very small.

AGRICULTURE.

1. Long, cold winters; short, cool summers; little rainfall; frost to July 1 and from September 1 with few exceptions.

2. The larger streams are usually at their highest stage in June, and after that fall rapidly, but furnish ample water for all irrigating purposes.

TIMBER.

1. The section of country situate south of the Union Pacific Railroad on the head of Bear River and its tributaries contains about 50,000 acres of timber, principally white spruce and quaking aspen of stunted growth, rarely exceeding 14 inches in diameter at the base of tree. Very little if any could be used or considered clear logs.

2. No trees have been planted except cottonwoods, and of those but few; other trees such as black locust and box elders might grow if properly cultivated, but on account of altitude their growth would be slow.

3. By giving free to all settlers all timber that they may require for use for fuel, building, fencing, mining, smelting, and manufacturing purposes, when not exported outside the Territories—provided no growing timber is cut or used measuring less than six inches in diameter for other than agricultural purposes, like fencing, &c. It would undoubtedly be advantageous for the second growth of all timber to have dead and fallen timber removed as speedily as possible and thus avoid to a great extent the future destruction by fire of the young timber. Many thousand acres of young pines and quaking aspen have been destroyed by fire this past season in this section that could have been saved had it not been for the masses of dead timber interspersed through it; there is more than enough of such timber in Wyoming and Utah that could be used for fuel, charcoal, or fencing in the next ten years, or prior to its becoming worthless by decay. The use of such timber most certainly should be accorded free. I have no hesitancy in saying that the want of good growing timber is too keenly felt by the settlers of these Territories to permit of their firing it in order to avoid the payment of stumpage or other tax.

If it is deemed to the interest of the government that timber should be paid for by the poor and half-starved pioneers and settlers of the Territories when used for the purpose of building up these Territories and making them habitable—in that case charge a low stumpage tax, say not to exceed 50 cents per foot, on saw-logs eight inches in diameter and over, and 10 cents per cord for wood, but permit no green or growing timber to be cut under 6 inches in diameter unless for fencing purposes. The sale or lease of timber lands in the Territories would tend to a monopoly in some sections of the Territories if not in all.

4. Would not classify the different kinds of forest lands in manner of disposition, &c. The quality of the timber and its accessibility changes in every county and cañon, and could not be fairly classified.

5. There is usually one-third spruce and two-thirds quaking aspen as second growth where timber has been burned off, and think there would be the same result where timber has been felled; should think it would require twenty-five to thirty years for a spruce to acquire the diameter of ten inches.

6. Forest fires are started generally from two causes: 1st. Indian hunting parties, who start fires for the purpose of driving game and a natural love all Indians have for setting fire to grass or timber when passing over or through it. 2d. Through culpable negligence on the part of white hunters and fishing parties leaving their camp-fires unextinguished. Extent of fires: I should estimate that two-thirds of the timber in this belt has either been destroyed or killed by fires during the past summer, they having been unusually destructive, caused by extreme drouth. Prevention: keep Indians on their reservations. Make and enforce very severe laws against the whites, say two or three years in penitentiary and $500 fine for starting such fires, accident or carelessness not to be considered an excuse. Two or three prosecutions under such a law would effect a cure or tend to make transient campers more careful.

7. To my knowledge there has been no willful destruction or waste of timber in either of the Territories of Colorado, Wyoming, Utah, Idaho, or Montana. In cutting saw-logs and railroad ties tree tops are left, proving destructive to the growing timber if left on the ground. In case a fire should break out I would make it obligatory on persons cutting logs or ties to clean up *débris* by cording up that portion suitable for fuel and destroying the brush.

8. Logs, ties, and wood are usually cut and delivered by parties who make that their business, and sold to railroad companies, saw-mills, mine owners, smelting works, charcoal manufacturers, agriculturists, in fact to nearly all consumers. Timber: pine and aspen, is not often to be had near place of consumption, nor does it grow nearer than from thirty to fifty miles from arable lands, in most cases over that distance. The ownership of timber, wood, ties, &c., is exclusively in the parties who fell it, until delivered to the party contracting for same.

9. I think that the control or management of the public timber lands, under the law, should be placed in the hands of the district land officers, with power to employ an efficient and capable man or men acquainted with the timber business and the country, to act as supervisors of the timber sections on behalf of the government, and see that the laws in regard to the cutting and preservation of young timber are complied with, and in case a stumpage or other tax law is to be enforced on timber cut, it shall be the duty of such appointee of the local land officers to examine into the correctness of the returns made by parties cutting timber; and it shall also be a part of his duty to act as a patrol or detective in case of fires being started in his timber district, with a view to punish the offenders.

Testimony of George R. Thomas, register of the land office, eastern district of Wyoming.

UNITED STATES LAND OFFICE,
Cheyenne, Wyo., November 14, 1879.

DEAR SIR: In accordance with your desire I give my views and facts in relation to Wyoming, more especially in the workings of the land system and the industries relative to it. I would refer, in the first place, to the circular sent to me by the Public Land Commission, the questions in which I will in part answer to the best of my information. As register of the land office for the eastern district of Wyoming, my jurisdiction extends over one-half of the Territory, or from the eastern boundary of the Territory west to the 108th meridian.

In a residence in the Territory for the past ten years, part of the time in the capacity of a United States deputy surveyor, I have had occasion to visit a greater part of our Territory, and in discharging the duties of my office have become familiar with the views held by the settlers on the public lands, and what would seem to me as injudiciousness in some of the laws relating thereto. In Wyoming, where the greater part of the land is of such a character as to be classed as desert land, it strikes me the requirements to obtain title should not be as stringent as in more populous and fertile States, for the land at best in these thinly settled regions cannot be worth more than the government asks; yet the settler, to procure a title, even at the price, is put to a large amount of trouble and expense, especially in making his final proof. He must bring two witnesses, sometimes several hundred miles, to certify as to his improvements. He must advertise his intention to make final proof and name a day after the expiration of thirty days that he will be at the land office with two specified witnesses. It often occurs that the witnesses specified cannot be obtained at the time named, or are unable to go perhaps a hundred miles or more to some officer before whom their depositions can be taken, thereby laying the applicant liable to delay and fresh expense in procuring other witnesses and advertising.

The desert act of March 3, 1877, meets a great want, inasmuch as the settler can perfect a title on unsurveyed land, for a greater part of our Territory is as yet unsurveyed, and with the small appropriation doled out but little progress takes place each year. This law gives an impetus to settlement, whereas under previous laws the settler was loath to make permanent or costly improvements on land to which the title was indefinitely postponed. Yet there is in this, like the other laws, one common and just complaint against the stringency required on final proof. One of the principal features in the physical structure of our Territory is the small amount of first or bottom land proper. Our streams coursing along the prairie cut deep, and the generally very narrow and irregular strips of bottom land are hemmed by higher bench lands or chains of rolling bluffs, so that a claim of 640 acres must necessarily be made up in a great part by these higher lands, to which irrigation could not be brought, which would fail in a compliance to the letter of the law. All of these lands, outside of a small portion bordering on streams, are of no utility but for grazing purposes. The grasses, of unsurpassed nutritiousness, depend for growth mainly on our late snows and spring showers. Oftentimes our dry seasons give but a scanty growth ere the curing process commences, stunting growth and yielding a scant supply of feed. And for this class of land, with its one redeeming trait, stock-feed, it seems to me government receives a very full compensation, the dollar and twenty-five cents per acre, without making requisite the full irrigation of the tract—in fact, an impracticable demand in many cases. Say, require the irrigation of one-quarter, or 160 acres, and I think the law would be of more equal satisfaction, and the government obtain the full value for much more land. In regard to the final proof required upon this class of entries I have often heard men say, "If I have to answer all of those questions I will let the land alone, for it is not worth over one dollar and twenty-five cents per acre after I improve it." Parties have said to me that they had rather buy of the settler that had obtained a patent for land than to fulfill all the requirements of the laws; yet these very men were probably contemplating the erection of several thousand dollars' worth of improvements. But their residence was in some town, distant from the land, and they did not want to fulfill the requirements of the homestead or pre-emption law by living on this land, merely to be granted the privilege of paying to the government the full value of the land.

The pastoral homestead law, yet one of the things to be, I should judge 90 per cent. of the stockmen would fervently wish it to remain in that innocent condition for some future generation to give it the breath of life. If by the wish of the stockmen it is to be it will never become a law. Only a few hours since one of the most prominent of our sheep men said, "If the law passes my sheep business is over, and it will be my first endeavor to sell out." I understand from conversing with them that the most prominent of our cattle men are also strongly opposed to the law. A meeting has been called by the secretary of the stock association for Tuesday evening, November 18, to discuss this question, and the opinions as gathered I will add to this before it is mailed.

I believe the present system of public-land surveys is as perfect as it can be made, with the exception of a few more requirements by the surveyors-general as regards the marking of lines and a more careful and frequent inspection to see that their instructions are complied with and the work carefully done. I am fully convinced that the surveyors-general should have a practical knowledge of surveying, for at present many of the offices are filled by men who have not the most shadowy idea even how to conduct a government survey, and in the smallest particulars have to depend entirely on the greater competency of subordinates. In the case of most of the surveyors-general a personal inspection of the work of their deputies would not enlighten them to any great extent, particularly as to whether the lines were properly run or not. The deputy, therefore, has nothing to inspire him to good work but his own conscience.

Registers and receivers should receive a salary of not less than $1,500 to each, and should by all means be allowed office rent, fuel, and incidental expenses; abolish fees, may be, except in contested cases, when the officers should be allowed as much as now, or more, for reducing testimony to writing. In most cases the amount allowed is hardly sufficient to pay a stenographer or clerk, whose services on such occasions are most urgently required.

Patents for public lands should issue in the regular order in which final payments are made, and should be returned to patentee, after final papers are perfected, with more promptness.

More prompt attention should be given by the department to communications received from the registers and receivers.

Expired filings of all kinds should be canceled at the expiration of one year after limitation of same, and not, as now, compel the second filer to obtain the relinquishment of a filing that has been dead by limitation perhaps two or three years.

In regard to the felling and removing of timber upon the public lands, I think the stumpage law as it is should be modified so that the rate for railroad ties should be doubled and the restrictions upon the chopping of cord-wood removed. Make a penalty for using green timber for such purposes. By such a law the timber land would be cleared of all fallen timber, with which our hillsides are covered, and thereby in a great measure prevent the spread of fire, which is so destructive not only to large timber but to the young trees that are everywhere springing up along the mountainsides. The choppers, as a rule, use only dead and fallen timber for cord-wood, as it is much lighter to haul and more preferable to the consumer.

Very respectfully,

GEORGE R. THOMAS.

THOMAS DONALDSON, Esq.,
Commissioner on Public Lands, Philadelphia, Pa.

APPENDIX A.

ADDITIONAL TESTIMONY RECEIVED BY THE PUBLIC LAND COMMISSION SINCE DECEMBER 15, 1879, AT WHICH DATE THE PRINCIPAL MASS OF TESTIMONY WAS SENT TO PRESS.

Testimony of R. C. Hopkins, Tucson, Ariz., on the Spanish laws of 1761 *and* 1789, *relative to irrigation in the western provinces of Mexico.*

TUCSON, *January* 4, 1880.

DEAR SIR: Your note of inquiry just received. The general regulations for the measurement of water, published in 1761, declare:

That the *regalia*, according to the common and rigorous acceptation of the term, is the right of eminent domain, which pertains to the monarch, in properties vagrant, shipwrecked, intestate, waters, lands, and mines; and that, therefore, the prince alone has the right to distribute the waters.

In 1789 instructions were issued by the comandante general of the western provinces of Mexico for the establishment of the new pueblo of Petic (Hermosillo) in the province of Sonora; which instructions were to be observed in the establishment of all pueblos within the jurisdiction of the comandancia general, which jurisdiction embraced all the western provinces of the vice-royalty of Mexico, including California. These instructions were approved by the King and direct as follows:

ART. 6. The tract of four square leagues granted to the new settlement (pueblo) being measured, its pastures, woods, water privileges, huntings, fisheries, stone quarries, (fruit) trees, &c., shall be for the benefit of the Spaniards and Indians residing within the territory measured off.

ART. 19. Irrigation being the principal means of fertilizing the lands, and that which most conduces to the increase of the settlement, the commissioner (appointed for that purpose) shall take particular care to distribute the waters so that all the lands susceptible to irrigation may partake of the benefits thereof, especially during the spring and summer seasons when irrigation is most required, in order to insure good crops, for which purpose, availing himself of the services of skillful and intelligent persons, he shall divide the territory (to be irrigated) into districts, marking out to each one a trench or ditch, starting from the main source, which may carry sufficient water for the irrigation of the tract for which it is intended, in order that each settler may know the ditch by means of which his tract of land is to be irrigated, so that he cannot and shall not have the power to take the water belonging to another, nor a greater quantity than may belong to his tract of land.

ART. 20. In order that the settlers may enjoy equitably the benefit of the waters, in proportion to the need of their crops, there shall be named annually, by the ayuntamiento (town council), one alcalde, or "mandador," for each water ditch, in whose charge shall be the distribution of the water to the different tracts to be irrigated, in proportion to the necessities of the lands; the alcalde to publish a list of the owners of the lands to be irrigated, and the hours of the day or night at which the respective tracts were to be irrigated; to the end that, from the carelessness or indolence of the owners, lands might not be without irrigation at the proper time, which, besides working private damage, would result in an injury to the community. To avoid this the alcalde of each water ditch shall keep a peon or servant, who, knowing the hour of the day or night designated for the irrigation of each tract or corn-field, shall, when the owner fails to do so, take care to irrigate the tract at the proper time; for which labor he shall be paid by the owner of the tract irrigated the just value of his labor, the sum to be regulated by the commissioner or by a judicial officer.

ART. 21. The repairs and cleansing of the main ditch to be at the expense of the community, and this work to be done at such times as the commissioner and town council may designate, each settler giving his personal labor toward the same, or paying a reasonable assessment.

The foregoing instructions and regulations are based upon laws from time to time passed for the government of the Spanish Indies.

In arid countries, such as a large portion of Spanish America, water for purposes of irrigation is an element of the greatest importance; hence, the laws of Spain in relation to the use and distribution thereof were exceedingly exact and stringent. The

use of the water belonged to the riparian lands, which could not be deprived thereof. It was an element pertaining to the land of which it could not be divested, the use and distribution thereof being under the control of officers appointed under the law, whose duties were to see that each tract of irrigable land received all the water to which it was entitled; and even when the owner of the land neglected to supply the same with water, the land received it through the ministration of guardians appointed for that purpose.

Very respectfully, your friend, &c.,

R. C. HOPKINS.

J. W. POWELL, Esq., *Washington.*

Testimony of C. Bielawski, draughtsman, surveyor-general's office of California, San Francisco, Cal., relative to present system of surveys, contract system, inspector of surveys, cost of surveys, townships surveyed, permanent monuments, Spanish grants, Mexican grants, triangulation survey, and topography.

C. BIELASKI, draughtsman United States surveyor-general's office of California, testified at San Francisco, October 16, 1879, as follows:

I was a military engineer until 1871, when I came to this country.

Question. Give us your ideas of what should be done to make more perfect the present system of survey, and what methods you would devise to make more accurate topography and definiteness of description.—Answer. From my experience I am led to believe that by following and properly executing the instructions of the present system, it would give a sufficiently accurate result in every respect, both as to surveying and topography. I believe that in running around a square mile of country a surveyor would have plenty of chances to get a distinct topography of that one square mile.

Q. What do you think as to abolishing the contract system and substituting a wage system?—A. I think that would give better results, but it would be at least three or four times more expensive than at present. I would suggest the keeping of the present system under better control. I would control it by an inspector or inspectors of surveys, who would inspect the work before it is paid for. I believe it is so in the English system. He should not be amenable to the surveyor-general, but should be an independent officer.

Q. Do you think the present prices adequate?—A. I do not think the present price adequate in some parts of the country. In the mountain ranges it is not. The surveyor-general can order a higher price if he thinks it is best.

Q. Do the exterior lines cost more than the other lines?—A. The government allows two prices, and the higher prices are not adequate in some tracts. In large tracts, all together, the surveyor might do well; but if a man has to go to the expense of preparing to survey a single township, it is very seldom that he will make any money out of it.

Q. How many townships have been surveyed in California?—A. I should say 3,000.

Q. Out of those 3,000 townships, do you know how many of them are settled?—A. Well, I should say that two-thirds are partly settled, and the other third perhaps not.

Q. Are these 3,000 townships subdivided?—A. A good many of them; a good many of them on the borders of streams have been subdivided, wherever valuable land has been found.

Q. Don't you think the surveyor should be permitted to give all possible information to settlers?—A. I should think so.

Q. What can you suggest in regard to more permanent monuments or stakes, or distinctions of any character to make surveys more permanent; and is not there a necessity for more permanent monuments?—A. We have here surveys made twenty-five or thirty years ago, and when surveyors now go there, they can trace all the lines very well. That is, on the plains and mountain lands, we have surveys north and south, and if properly executed, they will last thirty or forty years. Some corners have been mischievously destroyed, but if properly executed, I believe the surveys would last a long time.

Q. Have you had charge of making the maps of the Spanish grants?—A. I am not chief draughtsman. I used to have charge, but I have not now.

Q. Do you know of any of these grants having grown in a night over the original grant of the alcalde? Have they enlarged and any exterior lines been taken in?—A. I cannot answer of my own knowledge. I have heard of some such things.

Q. Do you think that this question of Mexican grants should be settled?—A. Yes, they should be, but I don't think there are many left unsurveyed. In fact, I think very few remain unsurveyed. The government ought to confirm the titles at once and get rid of the whole subject.

Q. Have you any further suggestions to make? For instance, would you not put a

clause in the law to authorize triangulation if it was, in the judgment of the surveyor best to use it?—A. They are allowed triangulation now. If the United States would make an accurate triangulation survey and let the United States land surveys be connected with it, I think it would be well, so that we could make a good map of the United States. The deputy surveyors are allowed fifty chains per mile, by way of mistakes. By having connections with real good triangulation points those errors could be discarded and a very good and useful map be made of the country; but as to the present system, I consider that if they are surveyed by solar compass in a good, faithful way, I think our surveys can be made very nicely. I believe it is not the duty of the United States to furnish an exact topographical map, but to plainly subdivide the lands by lines, so that every farmer and settler can go there and hunt up the land he wants and occupy it. As to further improvement in the topography, it is the duty of the State to do that. We have here in this State very nice county maps. These maps will be made in time everywhere when the country is settled. Just as it is the duty of the State (to whose interest it is to know all its resources) to make geological and valuation surveys, so it is the duty of the general government to parcel the land for sale with topography enough for identification.

Testimony of Charles W. Cross, attorney, Nevada City, Cal., on lode claims and placer claims.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. Charles W. Cross, attorney, Nevada City.
2. Seven years.
3. No.
4. A considerable practice in obtaining United States land patents.
5. Mineral patents from one to three years.
6. From one hundred to four hundred dollars, besides price of land.
7. Mountainous. Mostly mineral and timber lands.
9. The present system is good enough.
10. The desert-land law should be repealed.

LODE CLAIMS.

1. Several years of active practice in mining litigation and patents.
2. It is a very common complaint that applications for mineral patents move too slowly in the department at Washington.
3. The present practice is probably best calculated to protect all parties in interest, and has caused no trouble in this vicinity.
4. The apex of a vein is the vein at the surface. When a lode has been developed sufficiently to show it's worth, locating those facts can be sufficiently determined for ordinary purposes of location and record.
5. The present law as to locations works well; it would work better if more particularly observed.
6. No. It prevents both litigation and injustice, as it makes floating of claims quite impossible.
7. Yes; but under the present law the rights of the respective parties are easily determined.
8. No; not under the act of Congress.
9. Not in this vicinity, but 600 feet in width often includes several distinct and valuable ledges.
10. Seldom.
11. Don't know.
12. Have never known of such a case.
13. Not in this vicinity, under the act of Congress. When such litigation arises, it is usually from claims dating prior to the act of 1866.
14. That is the most important provision of all; the reasons are obvious to those who are well acquainted with lode mining.
15. No.
16. Stake off or mark boundaries, post and record a notice clearly defining the location and boundaries.
17. No.
18. Not where the records are kept with other land-title records. Local mining records are liable to much abuse.
19. All local mining-district laws should be abolished, but the records should be in

the county recorder's offices. It would be inconvenient to have the records at United States land office, on account of the difficulty encountered by persons at a distance in examining them.

20. No. These rights are very difficult and complex, and need juries and the best judges for their determination.

21. The right to raise ventilating shafts under proper restrictions from the dip of the ledge through adjoining ground would be a valuable amendment.

22. Have not considered this subject fully.

PLACER CLAIMS.

1. A large proportion being deposits in what are called ancient river-beds or channels in quartz gravel.

2. Yes; by several years of active legal practice in that kind of business, from $100 to $5,000 with contest, the difference in contested cases being chiefly attorney's fees in local courts.

3. From $50 to $300, besides price of land, without contest.

4. The general law not requiring, well-defined acts to evidence of possession, &c.

5. Defective in maintaining boundaries and making improvements.

6. There should be some reasonable limit to the quantity which can be acquired or held by any means by one person, corporation, or copartnership.

7. No; all placer mining claims should become public lands if no valuable improvements are made during any period of five years.

8. No; not since 1872.

9. No. But parties owning outlets on mineral lands frequently are very unjust in their exactions. The Congress should pass laws concerning easements and drainage and water rights for mining purposes, and all patents for mineral lands thereafter issued should be subject to such conditions.

Testimony of C. D. Davis, land surveyor and civil engineer, Fresno County, California, and H. S. Patterson, Fresno County, California, on agriculture and timber lands, mining and pasturage lands.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. C. D. Davis, Fresno County, California, land surveyor and civil engineer.

2. Twelve years in the county, thirty in the State.

3. Yes, under the homestead law.

4. Have witnessed the settling up of a new country and have been called on often to survey and get numbers for settlers, &c.

5. Time, three to four days; expense, $30 to $50, in uncontested cases; in contested cases, costs up to bankruptcy. We are thirty miles from a land office.

6. The laws are good, and without perjury the government cannot be wronged. (There are already laws for perjury.)

7. Rough mountains, low or foot hills, and level valleys, comprising all the different kinds of land in the question.

8. There can be no general rule nor geographical division. It can be best fixed by the reports of surveys. It fixes itself in part by the density of the population, where it remains sparsely settled after a reasonable time has elapsed to settle it.

9. No need of changing the present system except so far as to allow settlers to locate by sections on pasture lands, always reserving the right to the mineral to the miners. Timber land should be sold with a limit on the amount that any one man or firm could hold. Valley lands are already owned. My reasons for selling the timber is to protect it. Government cannot do it as well as the individual. Pasture lands should be in quantities sufficient to support a family by passing title to the settler. He could not be eat out, but could stock his range so that there would be no danger of losing his stock from want.

10. There can be no better system except as to pasture lands, and there the system simply wants enlarging.

AGRICULTURAL.

A little too hot for comfort through the summer in the valley, but by climbing the mountains can get anything you want. Rainfall rather light; average not more than 10 inches. Length of season nine months; many places not frost enough in the other three to kill orange-trees. Snowfall—none in the valley, and very little below 2,000 feet altitude, and not heavy until about 4,000 feet. Water supply without limit;

all we want through May and June (when we need it most). Sometimes an overplus six or seven months in the year.

2. Rainfall: The greater part in December and January. March often gives us a good rainfall. The supply from the melting of the snow is what we rely on for irrigation.

3. Successfully, but a small proportion.

4. About one-fifth.

5. Almost everything; but the country is settling principally on wheat, alfalfa, and fruits, (mainly grapes). Egyptian corn, though, is growing in favor very fast, and promises to be a leading crop in a few years. Raisin culture has proved a great success.

6. About 12 inches. This amount put on the land at any time will secure a crop.

7. The snows of the Sierras are our main dependence; they acting something like a reservoir, and melt almost exactly as our wants call for, and come down to us through the Joaquin and Kings Rivers.

8. I have had fifteen years' experience in irrigation, and must say that, with judicious handling, the fertility of the soil is greatly enhanced by irrigation. I have known good potatoes (Irish), cabbage, beets, parsnips, turnips, and barley raised at an altitude of five thousand feet, but think this the limit of cultivation.

9. All used; none returned; no restrictions except the State law, that requires canal owners to put the water to some practical use in order to hold their riparian rights.

10. Through the flood season (May and June) not more than one-fifth, by incorporating and locating under the State laws.

11. A little in regard to riparian or prior rights, but the main contests have been for rights of way and disputes inside of companies.

12. Three million five hundred thousand acres.

13. Yes, on all the foot-hill pasture lands, not less than five sections.

14. I would put them on the market for homestead purposes only, and forbid the cutting of oak timber until the expiration of the five years.

15. To rely entirely on the pasture it would take 40 acres to the animal. I do not think our lands furnish as much feed as lands farther north or nearer the coast either.

16. Fifty to one hundred.

17. About 12 head; but a small proportion, however, are on our pasture proper, four-fifths being in the valley.

18. The quantity remains about the same, but some kinds are dying out.

19. But little fencing on what we are denominating pasture lands. Do not believe it would pay to fence them.

20. Could not say.

21. Streams and springs mainly.

22. Five.

23. Except where overstocked it remains about the same. Changing a little in kinds; for instance, bunch-grass is in many places entirely destroyed.

24. Not well; if left to themselves will separate themselves.

25. I know of but little of late years between cattle and sheep. But sheep men are falling out constantly about the division of the public range.

26. Cattle about 30,000; seldom herded sheep; 300,000 herded in bands of about 2,000.

27. None other.

28. None where charcoal was deposited; where charred posts were used I sometimes have a little trouble.

TIMBER.

1. Timber of some quality grows over a large area, but timber lands easily accessible are scarce, the whole county not having over 150 sections, *i. e.*, timber fit for milling. The milling timber is fir, sugar and yellow pine.

2. Australia gum trees, lombardy poplar, locust, and walnut. The planting is just commenced; too soon to give results.

3. Sell them not more than one section to any one firm or man. This would prevent monopoly, for I would not allow them to acquire more than that from any source; and I would sell them so cheap that it would be cheaper to buy than steal. I stated before that I thought private ownership was the best protection the timber could have.

4. The only classification I would make would be to set off the milling timber. The rest would all go as pasture lands.

5. Yes; it springs up immediately, grows rapidly, but would take about two hundred years to mature if you let it alone. The principle of the fittest surviving is seen in this. The young timber comes up very thick; no possible chance for one in a hundred to make a tree for want of room. Of course, in the struggle the strong must be greatly retarded in their growth. The oldest pines here are less than 400 years old.

6. Fires generally start from the Indians, but are seldom very destructive here, at least not in comparison to fires in Oregon. The best prevention is for private owners to guard them.

7. Nothing more than that they are heavy. Shake men often throwing trees 4 to 7 feet diameter, and if it splits a little tough, leave it to rot while they hunt a better splitting tree. Saw-mill men, too, cut nothing but the clean trunks (comparatively). Competition being sharp, they are compelled to make an extra quality of timber, and as the timber costs them nothing (stealing it from government), they slash away. The main use here is for building and agriculture. (Private owners are the best guards.)

8. Everybody cuts that wants. The man that throws the tree owns it, and generally sells it to the consumer.

9. Of course it would be an improvement on the present plan, but not so good as interested guards.

MINING.

Question 1. Everybody that has been here thirty years has had more or less to do with mines; but taking the whole thing together, I think the best way would be to let the prospector get a survey and own all of his 20 acres vertical, compel him to pay for it, and give him a deed. This, I believe, would end all trouble, as it would prevent overlapping and give him all his location. I would let him locate to suit himself, *i. e.*, would let him locate so that the east lode would be on one edge of his survey, if he so willed.

Respectfully, yours,

C. D. DAVIS.

ADDENDA.—One word in regard to pasture lands above an altitude of 5,000 feet. These should have both the mineral and timber reserved; the timber, though, will never be needed except for mining, the way it is situated.

1. H. S. Patterson, Borden, Fresno County, California.

2. Six years, and State ten.

I corroborate with the above, except in answer to question 14, under the head of agriculture. The foot-hill lands should be sold in tracts not to exceed 320 acres to one man or farmer, and he should be a *bona fide* owner of land in the valley.

All of which is respectfully submitted.

H. S. PATTERSON.

Testimony of Peter Decker, of Marysville, Cal., relative to the amounts expended in consequence of the filling in of rivers by tailings from mines.

MARYSVILLE, CAL., *January* 5, 1880.

DEAR SIR: Absence from home and a press of business have delayed my promised report as to amounts expended here in consequence of the filling in of our rivers by tailings from the adjacent mines. The necessity for levees arising from this cause was made apparent before 1868, up to which time there was expended on levees about $30,000. In that year a system of levees for this city was adopted, and the cost of construction was $30,500. In 1875 the levees broke and our city was inundated to the depth of 3 to 5 feet, destroying property to the value of $500,000. During that year the city expended on levees for its future protection $105,000. In the year just past (1879) the city extended its system of levees at a cost of $50,000. Our system of sewerage has become nearly useless on account of the raising of the river bed, leaving no outlet. It cost $15,000.

The filling in of river beds and consequent overflow of the surrounding country has necessitated the construction of elevated roadways and expensive bridges, which have been constructed at a cost of $120,000, and which, like levees, require heavy outlays annually for their preservation.

The county (Yuba) has spent in addition to the foregoing on levees and bridges, $96,500, in consequence of the filling up of the streams, and, after all, our protection is inadequate, and will be totally so within a few years unless hydraulic miners are prevented from running their tailings into the streams. The adjoining county of Sutter has doubtless spent as much or more than Yuba for similar uncertain defenses, and other counties and districts not less. Thus large districts in the Sacramento Valley, including cities and towns, have been injured in property until they feel there is little protection, and a certain demoralization will ensue where the authorities are incapable or neglect to protect property. The disastrous effect on this city (eligibly located) is shown in the fact that in 1860 our assessment roll was $4,540,000. In 1879 it was $1,896,000, and that, too, on a high rate of asssessment.

I am, very respectfully,

PETER DECKER.

Maj. J. W. POWELL,
Public Land Commission, Washington.

Testimony of Rudolph Klotz, farmer, stock-raiser, &c., Shasta County, California, on agricultural and timber lands.

SHASTA COUNTY, CALIFORNIA,
December 12, 1879.

To the honorable board of Land Commissioners,
Washington City, D. C.:

My name is Rudolph Klotz; residence, Klotz's Mill, Shasta County; occupation, sawmill, sash, door, and blind factory, farming, butchering, and stock-raising. I have lived in Shasta County, of this State, twenty-nine years. I have bought offered land direct from the general government. I am well acquainted with the United States and State land laws. The public land now remaining in this State is timbered land, grazing land, mining land, and a very small portion of agricultural land, in this county or State. The general grazing land is very poor; the land in the foot-hills and valleys, after the month of May, dries up so it is not fit for grazing during the summer. Nearly all the stock men have to move with their stock to the mountains during the summer and return again in the fall season. For that reason I think the public grazing lands of this State would not be beneficial for homesteads, for the reason it being so poor it would require a very large quantity for a man to make a living on it alone. From the above-stated facts, in my opinion, it would be best for the general government to sell such land to the highest bidder in unlimited quantities. In regard to sheep-grazing, sheep and cattle will not graze on the same land. Sheep will drive the cattle off. Sheep grazing continuously on the same land will destroy the grass entirely. From the fact not having any rain on an average for six months in the year, all our grass comes from the seed; and sheep being a close feeder, but very little of the grass goes to seed, and what does go to seed the sheep eat the seed.

In regard to timber land, the timber land of any value is located on the Sierra Nevada Mountains, running the entire length of the State, and on an average of ten miles wide. The character is sugar pine, yellow pine, fir, and cedar. The timber in the foot-hills and valleys is principally oak, and only fit for firewood. The majority of the best timber for the manufacture of lumber has been cut, having been cut by all the mill men and board and shingle makers, there not being any law whereby the mill men and shingle-makers could procure a title to the timber, consequently they cut the timber without paying the government for it. If not got in that way, we would have had to live in tents or import lumber from some other country, the law that was passed at the last regular session of the United States Congress, only allowing a man to purchase 160 acres of timber land at the rate of $2.50 per acre; in my opinion the quantity of land is not sufficient for mill men. It will not pay any man to erect a mill for the manufacture of lumber for that amount of land. In my opinion it would be to the interest of the government to sell the timber land of California to the highest bidder, and in unlimited quantities; and at the time Congress pass a law (and be particular to strictly enforce it) to charge so much per thousand feet on and after a certain date for all timber that is cut on public lands. In that way it would make no difference to the manufacturer, for he could charge the same amount extra on the manufactured work that he had to pay for raw material; in that way he would not encroach on the government. The sale of timber at $1 per thousand would pay the expenses of collection and leave a balance of more to the government than any other way. The timbered land could be disposed of if it was not for fire. I would recommend the sale of the timber altogether, and not the land, for in an early time, before the country was settled by the whites, the Indians burned the timbered country every year, but since that time accumulation of rubbish from the growth of vegetation is so great that when a fire runs over the country and through the timber it destroys most all the timber. I have been in the mill business in manufacturing lumber for twenty-eight years, and consider myself as well, if not better, posted than any other man in the State on the timber questions. Everything that I have stated in the above I have done from my own personal knowledge and experience. I am very sorry that I did not see the government commissioners when they visited this county, as I could have given them more information orally than I can by letter. As to mining land, I have but very little knowledge.

If you wish any reference to me, I refer you to Hon. Newton Booth, United States Senator from California.

Yours, truly,

RUDOLPH KLOTZ.

Testimony of P. C. Scott, land and abstract agent, Red Bluff, Cal., on agriculture and timber.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. P. C. Scott, Red Bluff, Cal., land and abstract agent.
2. Twenty-two years.
3. Have acquired titles to public lands under most of the acts of Congress permitting such acquisition.
5. Depends on distance from local office and character of location. Actual homestead entries requiring the presence of settler at land office to make filings, necessitate a cost to such settler of say $30 more than pre-emption filings. A contested case is generally at an expense of about $75 more than non-contested.
6. The operation of United States land laws gives general satisfaction to actual settlers.
7. County of Tehama; total area about 2,048,000 acres; about one-fifth is susceptible of cultivation; about four-fifths are grazing and timber lands. No mineral lands in Tehama County; and timber lands are of but little value.

AGRICULTURE.

1 to 11. Irrigation is unknown except for minor gardening purposes; the farming portion being tropical, would not be inhabitable by the Caucasian race if generally irrigated.
12. Fully four-fifths.
13. Yes; not less than 320 acres, and would induce considerable settlement.
14. Would be advisable in perhaps two years hence, by which time every acre in any way susceptible of cultivation will have been occupied by settlers.
15. Estimate at three acres.
16. From one hundred upwards.
18. Diminished.
19. No.
23. Very much diminished.
24. No.
28. No.

TIMBER.

1. A limited supply of pine and fir in some mountains.
2. None planted.
3. Am very positive in asserting that timber lands should be sold in tracts of not less than 320 acres, at a price varying according to the estimated stumpage thereon.
8. Local customs are, to indiscriminately take possession of, manufacture lumber and destroy forests.
9. Yes.

LODE CLAIMS.

None in Tehama County.

TEHAMA LAND AND ABSTRACT COMPANY.
P. C. SCOTT, *Agent.*

Testimony of E. D. Bright, Trinidad, Colo., on agriculture and timber, lode claims, and placer claims.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. E. D. Bright, Trinidad, Colo.
2. Ten years.
3. Have pre-empted one claim.
4. None.
5. About one year until patent issues.
6. No.
7. All kinds, including coal.
8. By geographical division in this country.
9. Am unable to give good suggestions.
10. Know no better.

AGRICULTURE.

1. We are getting more rain and snow each recurring year.
2. Snow, winter and spring; rain, June and July.
3. None.
4. Any land that can be covered by ditch.
5. Corn, wheat, oats, barley, and all vegetables.
6. About one foot.
7. All streams supply good in county.
8. Know of no injury; crops raised at 8,500 feet in this section.
9. Cannot answer.
10. State laws.
11. Mainly regarding work to be done on ditches.
12. Almost all the eastern part outside of river bottoms.
13. I think so, but a large allotment should be made as many have large numbers of stock.
14. Put in market unlimited.
15. Can't say. Eastern part of country excellent for cattle.
16. Don't know.
17. Do not know.
18. Increased where sheep have not been.
19. Ranges are never fenced, except natural cañons.
20. I think so.
21. Streams and springs.
22. Don't know.
23. Diminished on account of tramping.
24. No.
25. Many on account of cattle refusing to graze where sheep have been.
26. Don't know. Number of sheep generally 2,000.
27. None.
28. In some places.

TIMBER.

1. Good pine timber everywhere west of eighth guide.
2. No timber planted as yet except cottonwood and box-alder.
3. Sale or lease, as saw-mill men cut all over the country and do not pay one cent for the privilege; I speak of this section.
4. They are generally the same here.
5. Could not answer definitely.
6. Indians and campers.
7. It has been universally here very destructive; have tried to stop it without success.
8. They all help themselves to any timber, cutting only the best.
9. Very certainly.

LODE CLAIMS.

1. None.
2. Know of none.
3. Ignorant of this.
4. Outcrops generally.
5. Can't say.
6. I think so.
7. Yes.
9. Seldom.
10. Yes.
11. Don't know any such case.
12. I think not.
13. I have only heard of such case.
15. No.

PLACER CLAIMS.

1. About 600 square miles, bituminous coal.
2. No.
3. Don't know.
4. Cannot.
5. I think not.
7. Never heard of any such case.
8. Not to my knowledge.
9. No.

Testimony of John Curr, Colorado Springs, Col., stock raiser. (Abstract.)

"Would suggest that all non-mineral land be offered at $1.25 per acre for six months, then reduce the price to $1 per acre for the next six months, then successively at intervals reduce to 75, 50, 25, 15, and 10 cents." He believes "it would be for the interests of the United States, and more especially of Colorado, to sell land in unlimited quantities at some such scale of prices as the above, the purchasers being their own judges of value." It would require from 2,000 to 4,000 acres of pasturage land to support a family. Much land is being fenced which belongs to the government, the parties fencing being the owners only of springs.

"Timber culture would not be practicable here." He advises that the government "sell timber lands at auction to the highest bidder." It is common to enter a claim, cut timber, and dispose of it, and then abandon the claim.

Testimony of John George Haas, stock raiser, Pueblo, Pueblo County, Col., on agriculture and timber.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

PUEBLO, COL., *November* 29, 1878.

Department of the Interior, Public Land Commission,
Washington, D. C.:

GENTLEMEN: The list of questions you sent me some time ago I have received and am ready to answer on some of them to-day.

My name is John George Haas; my residence is at a place called Chico, Pueblo County, Pueblo, Col., and my range is situated on southeast quarter of section 11, township 19, range 63; my occupation is stock raiser, and have been living on the same place above mentioned since the month of July, 1863, without any change. When the land was surveyed I went by the instruction of the surveyor by paying $206. I received one year after the patent for 160 acres of land—what they call pre-emption law. Then, through the same surveyor's information, I ask for the patent of homestead which I could receive by paying $19 and living on the same for five years. I did so by proving up and paying $10 more, about eight months ago, and have not received the patent yet.

In my section the land is very poor, scarce of water and timber. It is not fit for any other use than for pasture. On account of scarcity of water I don't think that the Congress would have any benefit by holding the land out of the market. The sooner it will come into private hands the better it will be for the county and State.

It is not much more land which would be taken by private entries for homesteads, as the land itself is not worth much only to those who own the watering places. I think if the land should come into the speculators' hands they would be more apt to get water on to the land where it could be got on to in anywise to receive benefit for their money. It would come cheaper to a man with small capital to buy it from them than to undertake it alone or in company with others.

The climate here is mild and dry. It generally snows very little, hardly ever rains till in May or in June, and mostly with showers. I have seen few steady rains during the time I have lived here, but it wouldn't pay to plant any kind of crops on account of it. The rains here do not help the crops much at any time. The crops are generally raised by irrigating from the streams, and good portion of the land; what cannot be irrigated don't pay to work it, as the land is poor. Where the ground is not level the land cannot be irrigated, and where the water has to be led a good ways a good deal of it disappears into the ground before it comes on to the land. By my experience very little water returns to the streams if taken out of the same.

The water during irrigating seasons is generally used out of all of the streams with the exception of the Arkansas River. The water is taken out by ditches made by one, two, or more land owners. Nine-tenths or more of the land can't be used for anything else, except for grazing purposes, and good portion of it nothing will grow on.

By my experience I think it will take at least from 15 to 20 acres of land to keep one head of cattle a whole year round. For my family use I generally kill from 20 to 25 head of cattle a year.

At the present time a good many cattle raisers fence in the lands to protect the grass for winter. Fences were not tried long enough in this section of the county to tell whether they will hold cattle during the bad storms. If cattle is in fences the owners will try to improve the same for their own benefit, otherwise cattle running

at large none of the owners will try to improve the same, as the neighbors would get benefit through it.

The supply of water for the cattle comes from springs which are owned by the stock raisers. The cattle runs at large in big herds.

I have never heard of any trouble of surveying corners, but think the time will come, as the corners are marked by small sticks and some of the numbers on them are to my own knowledge wrong.

The timber in this part of the country is cottonwood, but very scarce, and grows only on streams which are already owned or claimed up. I live far from solid timber lands, and have no knowledge about it, and yet less knowledge I have about lode claims or placer claims. If any further information is necessary I will answer as near as I can.

I remain yours, truly,

JOHN GEORGE HAAS,
Pueblo, Col., Box 202.

Testimony of V. V. Banus, attorney at law, Oakwood, Brookings County, Dakota.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. V. V. Banus, Oakwood, Brookings County, Dakota; attorney at law.
2. One year.
3. Have taken a tree claim and homestead.
4. Have had more or less practice in cases involving land disputes and settlements.
5. One hundred dollars for homestead, or $300 for commuted homestead or pre-emption. In contesting cases claimants are put to additional expense of from $20 to $50 in *ex-parte* cases, and from $20 to several hundred dollars in other cases.
6. See no reason why officers at local land offices should not be empowered to make cancellation in cases of relinquishment, instead of waiting for returns from Washington. Compelling claimants to make settlement and residence on land in cases where affidavit for homestead is made before a clerk of the court is a hardship. See no reason why same privilege should not be granted as in cases where land is entered at the land office in person. The men who make the best citizens in a new country are those with families, and it is sometimes, and in fact generally, difficult or impossible to make an immediate residence, and the expense in travel is great, especially in long and narrow districts like those in Southeastern Dakota. Think contestant should have priority in case homestead or pre-emption is canceled under contest trial. Think homestead settlers should have same privilege as to time of making entry as in pre-emption cases.

The above constitutes the material changes that I would suggest. Think the land laws are wise, and, as a whole, well administered. Perhaps the government might be a little more vigilant in the punishment of perjury. The regulation requiring notice of proving up is an excellent one, and operates as a very salutary check to the rascality and perjury of unscrupulous land speculators. Hope the rule will not be set aside, as I understand some are making an effort to have it done away with.

All of which is respectfully submitted.

Respectfully, your obedient servant,

V. V. BARNES.

Testimony of James G. Boyle, Olivet, Hutchinson County, Dak. (*Abstract.*)

A party should have the same right to file before the clerk of a court that he has to file in the local land office, and not be compelled to make actual settlement before filing. More stress ought to be laid upon the improvements on the land and less upon continuous residence. Many settlers find it impossible to occupy the land continuously, because, having no capital or money to start their farms with, they are compelled to hire out for wages in order to procure money for their own improvements. The *intent* of the law is often defeated by this requirement.

Testimony of William S. Cobban, editor, Roscoe, Moody County, Dak., on agriculture and timber.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. William S. Cobban, editor, Roscoe, Moody County, Dak.
2. Eighteen months.
3. No.
4. News editorial work keeps them constantly before me.
5. Pre-emption generally proved upon in six months, and then pass into speculators' hands.
6. Pre-emption and timber-cutters acts are benefiting few but speculators.
7. The repeal of these acts and an amendment to the homestead act, making it compulsory on the claimant to cultivate five acres of trees and make final proof only at expiration of five years.
10. Give to each actual settler a homestead of 160 acres, requiring him to cultivate five acres of timber thereon, and to make final proof only after five years' continuous residence, *i. e.*, on prairie lands.

AGRICULTURE.

1. Extremes, light; equally divided, light, none.
2. Spring; no.
3. All.
12. One-tenth.
13. Six hundred and forty.
14. No.
15. Good as any in the West.
19. No.
20. No.
21. Wells mostly.
22. Six.
23. Increased.
24. No.
28. But little.

TIMBER.

1. Scattering timber along Sioux River, of little account.
2. Willow, box elder, and cottonwood. May to October.

Testimony of Jerry D. Flick, land agent, Rockport, Dak., on agriculture and timber.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. Jerry D. Flick, land agent, Rockport, Dak.
2. Resided in county seven years, in Territory fourteen years.
3. Homestead, pre-emption, and timber-culture enties have been secured by myself.
4. My occupation has given me opportunities to learn the working of the land laws.
5. Cost for homestead $32, except improvements. Time, five years, uncontested cases.
6. A notary public should be allowed to make homestead affidavits as well as court clerks.
7. Our lands are well adapted for agricultural as well as pastoral purposes. No timber.
8. The government surveyor, who does the subdividing or runs the subdivisional lines would be the proper person to refer to as to character of lands, &c.
9. Am not well enough posted to give an opinion as to the best method to adopt.
10. The timber-cutting act should be confined to actual settlers of the country or land district. As it now exists, parties from the Eastern States come and enter a tract of land and never come near it again until he wishes to make final proof.

AGRICULTURE.

1. Climate very healthy; sufficient rains for crops; seasons about as in Illinois; very little snow falls; irrigation not required.
2. In spring and summer.
3. All of the Territory of Dakota.

5. None.
6. No irrigation required for wheat.
7. James or Dakota River.
8. I am not acquainted with irrigation; none of the country requires it.
12. One-twentieth part.
13. It is; 80 acres is sufficient for each settler.
14. Not at present, and when it is done the quantity should be limited to 160 acres.
15. Three acres; compares favorably.
16. Three cows.
17. Two head.
18. Increased.
19. We have no fences. Herd law is in force here.
20. I think not.
21. The James River and several small creeks in the county.
22. Five head.
23. Diminished.
24. Not very well.
25. Pastures will be ruined by double pasturing.
26. Cattle, 1,000. Sheep, 3,000.
27. None.
28. A great deal of trouble is experienced by settlers and county surveyors. The United States Government should pass, for use, more stringent laws in regard to deputy surveyors.

TIMBER.

1. We have no timber.
2. Cottonwood, box-elder, and black walnut.
3. Have no suggestions to offer.
4. Have nothing to offer on the subject.
5. Cottonwood sprouts out from the stump.
6. Usually caused by roving bands of Indians.
9. I think they would.

Testimony of C. J. B. Harris, lawyer and real-estate-dealer, Yankton, Dak., on agriculture and timber.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. C. J. B. Harris, lawyer and real-estate dealer, Yankton, Dak.
2. Nine years.
3. Yes, about 500 acres, with soldiers' additional rights.
4. Making papers and filing for settlers.
5. Uncontested pre-emption, $210; homestead, $25; time, six months' pre-emption; homestead, five years.
6. Yes; contests should be made returnable before some officer of county where the land lies.
7. Nearly all excellent agricultural land in Southeastern Dakota.
8. Class it all arable.
9. Present system needs no change.
10. I cannot suggest any improvement.

AGRICULTURE.

1. Climate about like Central and South New York; less rainfall and snowfall.
2. In the spring and summer, when most needed; less than farther east, but increases with settlement of the country.
3. All or nearly all.
4. No irrigation here.
5. None.
15. Five acres. Better than in New England or New York.
16. I do not know.
17. About ten.
18. Increased.
19. Do not fence generally. Herd law in force; cattle can be confined with safety by fences.
20. Yes.

21. Average; a great many rivers and lakes; also some large spaces without water.
22. I do not know.
23. I do not know.
24. Yes.
25. I do not know of any.
28. Yes, some surveys are very poorly made and marked.

TIMBER.

1. Considerable on Missouri River; mostly cottonwood; some hard wood.
2. Walnut, maple, cottonwood, cedar, and pine; rapid growth; cannot state time.
3. Nearly all disposed of about here.
5. Yes, of cottonwood; very rapid growth.
7. Timber on school sections has mostly disappeared; other timber lands entered.

Testimony of James Holes, Fargo, Dak., on agriculture and timber.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

FARGO, DAK., *September* 29, 1879.

Public Land Commission, Department of the Interior:

1. My name is James Holes; residence, Fargo, Dak.; occupation, seed-wheat raising.
2. Over eight years.
3. Yes; under the pre-emption law.
4. Thirteen years' experience on frontier.
5. Time, six months to a year; expense, legal land-office fees.
6. In case of death of a land officer, an unnecessary delay in the appointment of a successor.
7. They are agricultural, pastoral, mineral, and timber lands.
8. By an examining commission.
9. One hundred and sixty acres for the agricultural portion and 640 for the pastoral.
10. Six hundred and forty acres pastoral land are a homestead.

AGRICULTURE.

1. Cold in winter and warm in summer; rainfall ample in Eastern Dakota; snowfall below the average of Northern States.
2. From April till November; the most in June; least in November. Yes; it comes when most needed.
3. The entire Territory of Dakota.
4. Do not know of any portion that requires irrigation.
5. None.
6. Have never measured the rainfall.
7. Plenty of rain.
8. Don't know anything about irrigation.
9. Never saw an irrigating ditch.
10. Have used no water for irrigating.
11. No conflicts have arisen.
12. About one-fourth of Western Dakota.
13. It is practicable to establish homesteads on pastoral lands and give 640 acres to each settler.
14. It is not advisable for the government to sell these lands at private sales.
15. About 4 acres.
16. Fifty head of cattle.
17. Do not know.
18. Neither one.
19. No, not the regular herders.
20. No.
21. Running streams.
22. About five.
23. Diminished.
24. Yes.
25. Do not know of any.
26. They are herded in herds from 10 to 60.
27. Would suggest that poor surveys be not accepted by the government.
28. Yes. The survey is miserable.

TIMBER.

1. Fifty-six thousand acres in Cass County, hard wood.
2. Cottonwood, box-elder, elm, soft maple, butternut, and black walnut, &c.
3. Charge stumpage on pine lands; dispose of hard wood to the homestead and pre-emption settlers.
4. Yes; would classify them.
5. Yes; there is a second growth of timber, which in my estimation should be free from taxation, both timber and land on which it grows, in the prairie counties of the west.
6. Generally set by Indians or white men; are very destructive. Stringent laws strictly enforced.
7. Persons or corporations cutting government timber should be made to pay its full value.
8. They generally steal it. Felled timber is personal property.
9. Should have local agents to look after government timber.

Know nothing of lode claims or placer claims.

JAMES HOLES.

Testimony of H. N. Maguire, Rapid City, Dak., relative to defect, &c., in the working of the public-land laws, homesteads and pre-emptions, desert-land act, timber-culture act, and mineral-land laws, coal, mineral claims and claimants, pastoral and timber lands, surveys, mining records, litigation, mines, mineral-land offices or courts, placer ground, titles, irrigation, agriculture, and land grants.

RAPID CITY, DAK., *December* 7, 1879.

To the Honorable Public Land Commission, Washington, D. C.:

GENTLEMEN: Your list of interrogatories regarding the public-land system having just reached me, and the time to answer them in detail, less the seven or eight days required to carry my letter from the Black Hills to the national capital (that it may reach you by the 15th instant), being but a few brief hours, my treatise will not be as elaborate as I could wish, but I shall endeavor to "cover all the ground."

In 1859 I was one of the hopeful thousands who were carried away by the Pike's Peak gold excitement, and since that time I have been engaged in business in Utah, Colorado, Nevada, Arizona, Idaho, Montana, and Dakota, and have been identified with the material interests of the Black Hills of Dakota since the early spring of 1876. It has always been my disposition, and generally a necessity of my business interests, during this experience of twenty years in the far West, to study climatic conditions, mineral and agricultural resources, and the various methods under which government relinquishes its primary right to the soil and regulates its transfer to private ownership.

Detailing practical examples would probably be the most effectual way of exposing defects in our public-land laws and suggesting needed amendments; and as I have had some personal experience in the premises, you will excuse me for including it among the examples I shall give.

1. Some years ago, being at the time engaged in professional business in Bozeman, Mont., I filed in the district land office, under the pre-emption act of 1841, on a quarter section of land five or six miles south of that town. I had a comfortable cabin erected and moved into it with my family. I hired a farmer and fence builders, and sent to New England and New York for small fruits and shrubbery, and within six months from the date of settlement had expended well on to a thousand dollars, besides having given a prior claimant a valuable consideration to relinquish his right at the time I took possession. During the first six months I rode each morning to town to attend to my professional business, returning at night. It was my home, my residence, to all intents and purposes. But when winter approached I removed back to my town residence, and there remained until spring. Then I returned to the ranche, having built a new and more comfortable residence, and employed, as the year before, a practical farmer. My business affairs assumed such a shape that I had to return to town the next summer; and fearing my possessory right might be impaired by the step, and having up to this time paid but little attention to the practice under the public-land laws, I referred the matter to an attorney, who made a specialty of that line of business. "Abandon your pre-emption filing and homestead," he wrote me, "a homestead entry cannot be easily defeated." I followed his advice, and did not get back to my ranche until eight months after, six months' absence being *prima facie* evidence of abandonment, but had a personal representative on the ground most of the time, who occupied the cabin first built; and when I did get back I could only remain on the land with my family four months, when I was again compelled to re-

move to town. So far I had expended in improvements a thousand dollars more than I had realized, and about then (the summer of 1875) I got "the Black Hills fever," and arranged for my family to visit Eastern relatives, while I sought a change of luck in the new Eldorado. At this time I had become too well posted on the principles and practice of the public-land laws to squander any more money on my ranche, and so transferred my improvements under a quit-claim for a trifle. Having relinquished my right under the pre-emption law, to change to a homestead, I was not allowed to resume my rights under the former, the technical ruling being that I had "once had the benefit of the pre-emption law," and I could not prove up under the commutation provision of the homestead law, because I could not prove I had been "residing upon the land continuously for at least six months," and was still a resident thereof; and so I had to leave the land to the next comer, though both my pre-emption and homestead entries had been made in good faith, and I had, immediately following my first settlement, resided upon the land six months continuously, and had expended upon it over a thousand dollars, besides devoting much thought to it and performing no little personal labor. Thus, under the technical rulings, I have exhausted both my pre-emption and homestead rights, and without getting an acre of land. [A settler does not exhaust his pre-emption right by filing an abandonment, as a general rule, but he does under the rulings in the case cited, when he continues on the same tract, changing from a pre-emption to a homestead right.]

2. A poor old settler, named Noah Gee, purchased the possessory right of another homesteader, named Llewellyn, to a tract of land northwest of Bozeman, and immediately settled upon it with his large family, the prior settler having given him a simple unattested bill of sale, and then left for parts unknown. A few weeks after the old gentleman came before me, as county judge, and applied to enter the land under the homestead law, and the regular application and affidavit were sent in to the district office. They were returned on the ground that Llewellyn's entry had not been canceled, and that Gee had no regularly witnessed and acknowledged deed of conveyance from him. Then followed a fruitless and vexatious effort on my part to find Llewellyn, to have him execute a deed complying with the technical requirements of the Land Department. The commissioner was appealed to, the facts proved by affidavit of the settler having paid all his money to the former occupant, of his having settled upon the land with his family, and of the unavailing efforts that had been made to ascertain the whereabouts of Llewellyn; but the answer came back that Llewellyn's entry could only be canceled through the forms of a regular contest; and while Gee's attorney was engaged with the case, notice came that the Northern Pacific Railroad Company's indemnity lines had been fixed by their filing in the Interior Department the selection of their route, and the line in dispute being on an odd section it was held to be "railroad land," though the iron track was still 500 miles away in a straight line. This left Llewellyn, who had sold out and left the country, the only adverse claimant of record to the railroad company. When I left that section, it seemed to be inevitable that the old man would lose both his purchase money and improvements. I afterward learned that he died on the tract, leaving as his only legacy to his children the fruits of hard work performed on land to which another had the legal title. [Those lands were afterward restored to settlement.]

3. For a full year a poor man named Carrol had lived with his family, and worked and struggled in poverty on a piece of land eight or nine miles northwest of Bozeman, which he had regularly filed upon under the pre-emption act. Adversity overwhelmed him, crops failed, sickness visited his family, carrying off a son, and he could "stem the tide" no longer. He came to me and inquired whether it would be possible to save something from the wreck. I told him he had fully complied with the law so far as residence and improvements were concerced, and that he could "prove up," pay for his land, and sell it to whoever he pleased. But how would he raise the money to pay the government price? He had to swear in making entry he was acquiring title for "his own exclusive use and benefit." It was impossible for him to continue on the claim; his resources were exhausted, a Rocky Mountain winter was whitening the hills, and he had a large family to support. My sympathies were touched at his story, which I knew to be true, and I told him to call again, having mentally resolved to help him out of his difficulties if I could. His claim was one of natural advantages, and I had a friend make me an offer for it, which would allow Carrol enough to get out of the country after paying the government price, but not near enough to remunerate him for the labor and improvement he had put upon the land. I then had my clerk make out a deed, ready for Carrol's signature, conveying the land to this friend, and sent for him to come in with his witnesses. All the necessary facts were proven by credible witnesses, the required personal affidavit was made, and I passed over to the receiver $200, with his official fee; and then Carrol signed the deed, and it was sent to the county recorder. But my clerk, expecting the receiver would be at my office the day before he came—as it had been arranged for him to be—dated the deed one day too early, and so it went on record. A mercenary land agent two or three years after overhauled the records for flaws he might take advantage of in his own interest, and dis-

covered the conflict in dates. The facts showing "a case," the matter of confliction was brought to the attention of the commissioner, whereupon he ordered the entry canceled, and intimated it would be altogether the proper thing to do to arrest and prosecute Mr. Carrol (a man of unquestionable honesty) for perjury. Yet it has been the practice, since the first land office was opened, for claimants to mortgage or sell outright their land before the ink was dry on the receiver's certificate of final payment; at least one-third of all the lands entered are so disposed of.

3. Another case, involving great personal hardship, is reported from Northern Dakota, and, considering the general depression which had existed throughout the country previous to the present revival of trade and industrial activities, I have no doubt it is but one of many of the same kind. A claimant, having expended all his available means and performed a year's personal labor on a piece of land he had filed on under the pre-emption law, presented himself at the district office to offer his final proofs and make payment. His proof as to residence and value of improvements was altogether satisfactory; but when he was asked the formulated questions, "Do you own 320 acres of land in any other State or Territory?" and "Have you left land in any other State or Territory to settle on government land?" he was struck with dismay. He felt that the last-earned home of a long-life struggle had been wrenched from him, for he could not give negative answers. He *was* the legal owner of 320 acres in the State he came from; but he said he was willing to swear that, though the legal title vested in him, the land was hopelessly mortgaged; that he had little, if any, hope of ever redeeming it; and that this explained why he had left his old home and sought a new one on the prairies of the West. He was not allowed to make entry. The law and rulings were both against him, and it is presumable he would consider himself fortunate to get for his improvements half their cost.

5. There is a large class of enterprising and every way worthy citizens who have been in the vanguard of emigration since Chicago was a frontier village. Life with them has been one continuous battle scene. The nation and civilization have been benefited—the former strengthened and the latter extended—by their struggles and sacrifices; yet poverty has uniformly been their lot. The large majority of this class exhausted their pre-emption right among the first who availed themselves of the law of 1841; they afterward took the benefit of the homestead act of 1862; and again they are "blazing" paths in the wilderness, courageous as ever, but without that physical strength and endurance which belong to youth and the meridian of life. Around them are unoccupied thousands of acres, but it is perjury for them to drive another location-stake; to seek, under the law, a little patch of ground of their own to be buried in. It is easy to distinguish this meritorious class from those—none of whom are ever *convicted*—who make a business of obtaining lands in one district after another by perjury and subornation of perjury.

The above are all practical examples of general application, and to the claimant in each the public-land laws have proved "a delusion and a snare." To apply too closely the jurisprudential maxim that "ignorance shall not be plead to excuse violation (by omission as well as commission) of law," in administering the land laws, often defeats the beneficent object of their enactment. The general reason upon which the maxim is based, that of public policy, does not extend to the public-land laws, which affect but a few of the entire population, are intended to reward the bravery and enterprise of those who widen the boundaries of civilization and add to the nation's wealth by leading in the settlement of the public domain. In their behalf, if at any time or under any circumstances, technicalities should be disregarded when they contravene substantial justice. If the settler builds his cabin and turns his first furrow with the *honest intention* of becoming a freeholder by complying with the requirements of the land laws, and no prior right exists to the same location or any part of it, he should be held, by virtue of his improvements so made in good faith, to have acquired equities in the tract which could not be defeated by subsequent proof of his being disqualified to make entry under the technicalities of the law. The consideration to the government is *the act of settlement*, the increase of the taxable wealth of the country, by adding to it cultivated acreage and extending the means of production. But if title should be sought through fraud, let the offender be convicted and punished under the criminal laws.

"But it is impracticable," I will be told, "subversive of all law and order, to disregard, relax, or modify the express enactments of the legislature to relieve against the hardships of individual cases." To this I answer, first, that the Interior Department has, in my humble judgment, established rules and issued instructions, under the general delegated authority of Congress to that department to prescribe the methods of executing the land-laws, entirely too complex and exacting to be in harmony with their generous, humane spirit and the motives and objects of their adoption; and, secondly, Congress has before it the objectionable features, as shown by experience, and can, by amendatory legislation, give the country a more perfect system. For instance, taking in their order the individual cases above cited—

I. Should not the fact that I had expended much money and time on a tract of land

without having acquired title give me an additional claim to make new filings, instead of disqualifying me from ever again seeking to make entry under either the homestead or pre-emption law?

II. In the second case, would not substantial justice have been done by allowing the unfortunate settler who succeeded to the possessory right of another without (through ignorance of the legal principles governing the transfer of realty) taking a regularly executed deed, to have made a *provisional entry*, subject to the prior right of the first claimant of record—such provisional entry to be, under the principle of relation, considered as absolute when he came in with his final proofs?

III. In the third case, why should a variance of one day, caused by a clerical error, between the date of the day of transfer and the receiver's certificate—the government having received the price fixed upon the land, and the evidence being that the law had been complied with as to residence and value of improvements—have subjected the unfortunate pre-emptor to a threat of prosecution for perjury and the innocent purchaser to a forfeiture of the land he had honestly paid for.

IV. In the fourth case, would it not have been good policy and in harmony with the general spirit of the land laws to have allowed the claimant to make entry upon his filing in the district office a certified abstract of title of his former homestead, and making affidavit, supported by the oaths of two credible witnesses to his credibility, that he was not worth enough, over and above other debts and liabilities, to pay off the mortgage?

V. In regard to the class referred to in my fifth citation, would it be in the slightest degree detrimental to the public interests, and would it not be in harmony with the motives and objects which were governing considerations in the adoption of the land laws, to make an amendment for their express benefit which would be somewhat of the nature of a bankrupt law for the benefit of the unfortunate in business? Give the old pioneers one more chance, upon their filing satisfactory evidence that they are landless, unable to purchase land, and have owned no land within five years next preceding the date of their application.

Gentlemen, there are many other defects and injustices, as I conceive them to be, in the practical workings of the public-land laws; but I cannot detail them within the time at my command and treat of other matters embraced in your list of questions which I desire to consider. But this particular fact I should like to impress upon your minds, that the experience has been that those who *willfully* violate and evade the provisions of the public-land laws *are never called to account for their wrong-doing*, while well-disposed and upright men are often subjected to great hardship and loss by the agents of the government sacrificing the *spirit* of the land laws to *their own arbitrary and inflexible rules;* and thus, too, have frauds been made possible, as the sharks of the land department know exactly what is required in the way of *forms* to acquire titles fraudulently, and they have as thoroughly systematized their operations as has the Commissioner of the General Land Office the government's. That class for whose express benefit the pre-emption and homestead and other land enactments were adopted—those who seek to acquire *homes* under them—are never guilty of intentional violations. Those who intentionally violate the law have no fear of its penal provisions; they are dangerous only to those who ask for a quarter section in good faith for the purpose of cultivation, and who do not make a business of studying *the tricks of practice*. The "professional swearers" about land-offices were never known to build a cabin or turn a furrow. Nearly the whole of Goodhue County, Minnesota, the most valuable farming county of that State, was fraudulently covered with Sioux half-breed scrip by bogus guardians of the mixed-blood children, for whose benefit the scrip was originally issued, the majority of the intended beneficiaries never having got a rood of land or a dollar for their scrip. The agricultural college scrip donated to the various States was a huge "job." Some of the States accepting it only realized from 25 to 60 cents on the acre represented; yet the bulk of it has been palmed off on the pre-emptors at its par value, the last robber in handling it being the attorney engaged to prepare the claimant's final papers. Invariably the moneyed shark in the background plans the fraudulent entry first and finds his bogus claimant afterwards, the latter in no sense of the word being a member of that noble army of pioneers who have conquered the wildernesses of the continent and carried the standards of American civilization from the lakes to the Pacific.

I view the "desert-land law," as it stands, to be in effect an offer of a premium for successful fraud in acquiring land titles, and a piece of class legislation in the interest of the capitalist against the *bona-fide* settler in good faith. Was it asked for by the practical farmers of Utah, Idaho, Montana, Arizona, or any other section where irrigation is indispensable? Pre-emptors and homesteaders in those countries never thought of such a measure, but bear testimony with one voice to the inexpensiveness and slight inconvenience of cultivation by irrigation, and the great advantages they have in opening farms in the valleys of the mountains, in natural conditions, over the old settlers in the organized States. Wherever water can be found to irrigate a section of fertile soil there always are, or will be, four pioneers ready to bring water onto it and

reduce it to cultivation, and thus become actual settlers in good faith. But I would favor government adopting measures looking to the reclamation by irrigation of extensive districts, where the outlay in money and extent of labor involved would be so great as to require large capital. If General Frémont's scheme to turn the waters of the Colorado River over the arid basin through which it flows should be realized, the result would undoubtedly be to give the nation a realm of Arcadian beauty and Italian fruitfulness.

The timber-culture act, considering the general character of the public domain still unappropriated, is the wisest measure of the kind ever adopted by Congress, and I submit that if it is amended at all, the change should tend to still further encourage forest culture on our timberless plains. It is beneficial in the highest degree to the citizen availing himself of its provisions; but the greatest resulting benefits will descend to posterity; and it operates to increase the national wealth from sources that would otherwise be measurably non-productive.

Radical reform is called for in the establishment of land-offices. The rule has been to locate them at the centers of political influence, thus making them subservient to the local influences of the places securing the location, instead of establishing them where the greatest number of agricultural settlers would be accommodated.

I have not the time to elaborate upon the practical working of the mineral-land laws, but would suggest that as they, like the agricultural-land laws, are primarily intended to encourage the development of the natural resources of the country—the first step in doing which is invariably taken by the poor man, the prospector—sound policy dictates that future legislation in regard thereto should mainly be directed to simplifying and making less expensive the methods under which rights by discovery are established. The capitalist is always able to take care of himself. The discoverer of the great Comstock mineral vien, which has made millionaires by the dozen, did not get as much as $100 for his immensely valuable find, and in a fit of despair, without a penny in his pocket, he blew out his brains. Within seven miles of where I am now writing the discoverers of the only producing silver-mine in the Black Hills—three brothers named Merritt—are following a promising coal-vein without enough money ahead to buy a month's provisions. I believe they will open a valuable coal-mine; and what then? *They will be at the mercy of the capitalist.* Under the provisions of of the coal law they must file on the land (now unsurveyed) within sixty days after the plat of survey is received at the district office, and within one year thereafter must prove value of improvements and pay for the land at the rate of $10 an acre. The plat embracing the land will be on file in the district office within three months, and within fourteen months from that time they must, in order to secure a quarter section each, raise about $5,000, besides providing for living expenses, purchasing tools, &c., from now until then; and they cannot realize by selling coal until a railroad shall have been constructed near their mines. No other discovery of a regular coal-vein has yet been made on the eastern side of the Black Hills. Men so situated cannot, under the existing law, make secure their rights by discovery; and without such men mineral discoveries would rarely be made. I would favor an amendment to the coal law allowing the discoverer of a coal-vein on the public domain, not less than fifty miles from any other known coal-beds, or each one of any association of discoverers, not to exceed four in number, forty acres of land embracing the discovery as a gratuity, and give him or them one year from date of discovery within which to file the required proofs. I also think it would be good policy to extend the benefits of such a law, modified to specifically apply to the different kinds of mineral found, to all discoverers of mineral in new regions. As the mineral laws now stand, the man with a little money in his pockets can do better to remain idle and watch for opportunities to take advantage of discoveries made by others than to explore himself.

I think the law fixing the surface extent of mineral veins ought to give unconditionally all within the side lines to the discoverer. Overlapping surface rights are the pregnant cause of nine-tenths of the litigation over mining property; and when these contests get into the courts the party having the most money is usually the monkey that weighs the cheese.

I do not believe it would be to the disadvantage of the mineral discoverer to cut down claims by right of discovery from 1,500 to 500 feet, "linear measurement along the line of the vein," for in nearly every instance he transfers his right on what is disclosed in his discovery shaft, and the capitalist is therefore the one most benefited by the extent of the claim; but if this change should be made I would favor square locations, holding all rights within the boundary lines inviolate on the surface. The miner should be allowed to follow his vein wherever it leads below, the prior location taking the ore where two veins intersect—which is the existing rule.

You ask "how the government can best ascertain and fix the character of the different classes of land." It is, in my opinion, impracticable for the government to attempt to do anything of the kind. The settlers or locators will seldom fail to claim the land for that for which it is most valuable, if known, and then the rules governing that specific kind of land—"agricultural, mineral, pastoral, timber, or otherwise"

—can be applied. There is not much danger of the government being defrauded by false representations as to character, for adverse claimants will nearly always put in an appearance when one tries to acquire title to valuable mineral ground as an agricultural claimant. Consider, gentlemen, that years ago Lieutenant Mullan graded a military wagon-road from Fort Benton to Fort Walla Walla across some of the richest placer districts that have been worked in modern times, his expedition embracing a full corps of scientists, and reported that he found no evidence of the existence of gold on the route, and you will concede the impracticability of governmental attempts to classify the different natural conditions of the public lands. That can only be done, so far as mineral lands are concerned, by individual enterprise, stimulated by the hope of finding a fortune.

As to pastoral and timber lands, the value of which as such can be estimated by viewing them, and should be designated by the field-notes of survey, title to them will not be generally sought by this generation under the pre-emption and homestead laws; and I would suggest that it is not necessary for Congress to legislate at all in regard to the former, and that the latter be disposed of, in small tracts, by lease under long terms—until cultivated timber could be grown large enough for domestic uses—reserving to the miner the right to enter and explore and mine for minerals. This assumes that contiguous farmers would be allowed to enjoy the grass lands as tenants in common, subject to the local laws regulating and defining rights by mere occupancy, and that the lessees of the timber lands would only acquire the right to cut and appropriate the growing timber. The general government (or State by cession to it) retaining the title paramount (except such portions of the timber lands as might be transferred under qualified mineral patents), the time would come—the tillable area having been extended to the furthest limit by the necessities of increasing population—when both classes of lands, now comparatively valueless, would be a rich source of income to the public Treasury.

Before leaving this branch of the subject, I would suggest that the law in regard to quartz-mill sites needs changing. It grants to mine-owners five acres of "non-mineral land" for this purpose. Without a mill-site a quartz-mine is barren property; and it is almost impossible to find five acres of "non-mineral land," in the strict sense of the term, conveniently near a quartz-mine; and, besides, the ease with which pretended mining claims can be set up on any tract of ground of that extent, near a developed mine, has attracted to the mining districts a class of bad men, locally known as "blackmailers," unscrupulous vagabonds, who make a business of asserting adverse rights expressly to be bought off.

I am not well enough acquainted with the different systems of surveys to express a valuable opinion upon their respective merits; but would suggest, as settlers on the public lands are usually poor men, that it is high time to put a stop to the system of "making surveys on horseback," which means for the subcontractors having charge of the work in the field to run out the exterior lines of the townships, hurriedly establish the section and quarter-section lines with cabalistic marks no one can understand (and which it is to their interest to make unintelligible to the settlers), and then draw their vouchers. The established rules of marking boundaries are seldom observed. This is an abuse needing correction.

In the Black Hills, "croppings" are often wider than the maximum legal width of veins.

In all mining countries mineral veins frequently so deviate from the direction of the supposed trend in locating them as to go outside the established side lines. Hence the justice and expediency of the rule, "follow the vein underground wherever it leads."

As to the suggestion that mineral discoveries be recorded in the government land-offices, and that the officials thereof be invested with exclusive jurisdiction of all questions regarding adverse rights (of course with the right of appeal to the Commissioner and Secretary of the Interior), I would suggest that this might necessitate the establishment of a multiplicity of land-offices in the mining regions; and as a matter of convenience and security to themselves, though incurring additional expense, prospectors would undoubtedly prefer, if this change were made, to initiate their rights by district or county record, as now provided, and then file a certified copy of such first record in the land-office, for the reason that the former offices might be more immediately accessible. And when a location is made the discoverer is anxious to have his record made at the earliest moment. And if all this kind of business should be transferred to the Interior Department direct, I would suggest that a distinct class of land-offices be established, to be known as "mineral-land offices," to be given exclusive original jurisdiction over mineral lands, and that they be officered by *good lawyers*, who have had practical experience in mining litigation. The responsibilities of their position would be grave. Their adjudications would at times involve property rights to the extent of hundreds of thousands of dollars, and it would be a mockery of justice and a disgrace to the government to give such appointments to those who had done the most effective service on the stump or at the ballot-box. So far as the Black Hills are concerned, if Dakota is not at once admitted into the Union or a law passed extending

her judicial facilities, something of this kind will have to be done, as our local courts are overwhelmed with the increasing business brought before them, the bulk of which is mining litigation. But as admission might not be the proper remedy for all the mining Territories, and probably the same state of facts would apply in a degree to all, we here have a cogent argument in favor of establishing "mineral-land offices" (or courts) on the general plan outlined.

If discoverers of mines of the precious metals, like those of coal deposits, should be compelled to acquire title by purchase within a given time, I would make that time not less than three years. The sound policy of favoring discoverers as against capitalists is obvious.

I never knew an application to be made for placer ground with the main object of thus acquiring title to a vein. I do not believe the general law, so far as it relates to placers, could be improved. It is seldom invoked, the local rules almost universally prevailing; and strong companies will never be allowed, under the operation of the local rules, to acquire vast bodies of alluvial gold deposits which are available to the poor miner.

In practice, as well as under the decisions of the courts, it is nearly impossible for claimants under other than mineral titles to prevent mining claimants from developing their ground.

It is questionable whether it will ever be necessary to resort to irrigation in the valleys of the Black Hills of Dakota. Excellent crops have been raised three years in succession without irrigation. But should it be found, by future experience, that irrigation will have to be resorted to in seasons of exceptional dryness, an abundance of water for the purpose can be had from the Rapid, Spearfish, and Redwater Rivers, which drain the most extensive farming districts of the Black Hills.

Moving on west and northwest from the Black Hills, until the valleys of Northern Wyoming and Montana are reached, we find increasing dryness in the atmospqere; but no part of the continent is better watered than those regions, almost every cañon having its flowing stream, and the valley lands are usually sloping, so irrigation adds but little to the labor and expense of cultivation. Millions of acres lying between the Black Hills and the headwaters of the Columbia, now supposed to be worthless except for grazing purposes, will in time be reclaimed and rank among our very best wheat lands. I write and form my conclusions from personal observation.

If mountain soil can be injured by irrigation, it has not yet been, to my knowledge. The oldest cultivated soil west of the Missouri River, in large bodies, is in Utah, where irrigation has always been resorted to, and there "worn-out soil" I never saw or heard of. And in Montana repeated irrigation seems to have the effect of making the soil quicker and deeper—new mineral fertilizing elements, I presume, being disclosed, and imparting their virtue with each successive following, from the water acting as their solvent.

There are scarcely any valueless valley lands anywhere in the mountain regions of the United States that it is possible to irrigate. In Eastern Oregon and Washington Territory, in California, Nevada, Utah, Arizona, Montana, Idaho—everywhere, on either side the great Rocky Mountain Range—nearly all below the sterile snow-lines are natural grazing lands, or can, if possible to irrigate, be reduced to cultivation. The sage-brush and prickly-pear wastes, so long thought to be utterly irreclaimable, have been made to "blossom as the rose." The "Great American Desert" of the past generation has been, by the progress of American enterprise, obliterated from the maps and buried beneath the richly-producing furrows of the pioneer farmer. The high elevations, generally, from the head of the Missouri to the mouth of the Colorado, are covered with noble forests or nutritious grasses, or are veined with fissures of gold and silver rocks, while coal and all the base metals are abundantly found. Believe me, gentlemen, the grand march of American progress will not be retarded by the mountain barriers between the older States and the young civilization of the Western seaboard, but accelerated rather. There seems to be, at every part of this vast empire so far as explored, incentives to human enterprise. Over all these vast regions new trade-centers will be built up and connected by railroads; and, as it is only through the toil and sacrifices of the producing classes such achievements are possible, it is earnestly hoped that the last grant of lands has been made to monopolists—that every acre will be reserved for homes for the brave souls who lead in the work of subduing the wilderness and enlarging the fields of honest industry.

Respectfully submitted.

H. N. MAGUIRE.

Testimony of Charles T. McCoy, register of deeds and clerk of the court, Bon Homme, Bon Homme County, Dakota, on agriculture and timber.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. Charles T. McCoy, Bon Homme, Bon Homme County, Dakota, register of deeds, and clerk of the courts.
2. For twelve years.
3. Yes; have acquired title to land under homestead law.
4. Have been clerk in the United States land-office at Springfield, Dak., and also observed closely the general workings of the laws.
5. From personal experience. The title to my homestead cost me, cash to the government, $18; house, $75; breaking 18 acres, at $5 per acre, $90; incidental expenses, $25; total, $188. Breaking at that time, 1868–'69, and all other material was about double in price of what it is at present.
6. Yes; in the first place, I think that when a party commences his contest in good faith, and deposits his fee and has all the expenses to pay, he should have a prior right to the land, and if the contest is decided in his favor, he should be allowed at least thirty days to appear at the local office and make his filing. Second, I think that when a person has lost his right through some technical point, and can make it appear beyond a reasonable doubt that he has not disposed of it either directly or indirectly for a valuable consideration or favor, that his right should be restored, as it seems to me that he has had no actual benefit unless he has perfected an entry, neither has the government been deprived of any of its public domain.
7. The soil is of a light, sandy loam, very durable, and I have known parcels that have been under cultivation for eighteen years without rest that are apparently as strong and fertile as at first. The remaining government lands of this county consist almost wholly of upland prairie and pasturage.
8. By general rule.
9. Have no practical knowledge of surveying.
10. Have no suggestions to make.

AGRICULTURE.

1. The climate is good rain-fall rather light. The winters are mild, with the exception of an occasional snow-storm. Seeding generally commences in March, and corn-planting in the last of April and first of May. Snow-falls are generally light, and stay but a few days. Rain-fall is rather scarce in the month of July, when wheat is in the dough. No irrigation ever been tried in this locality.
2. The rainfall is generally in the months of April, May and June, September and October, plenty in the fore part of the year; not sufficient in July and August.
3. All of it.
4. Have no irrigation.
5. None.
6. No knowledge of the form of irrigation.
7. Rather poor, I should judge.
8. None.
9. None.
10. None.
11. None.
12. Very small, not to exceed one-tenth.
13. Think there is no need of distinction here.
14. Not at present.
15. About four acres. Good.
16. Twenty-five head.
17. Six and one-tenth.
18. Increased rapidly—in past twelve years.
19. No. No.
20. No.
21. Creeks in some localities, but generally woods.
22. Know nothing about sheep.
23. Have no knowledge.
24. They do in some localities here.
25. None that I have heard of.
26. Cattle, 3,044; sheep, 492; this is exact, taken from the official return of the assessor.
27. None.
28. Yes, considerable. The surveys are not marked distinctly, and great errors appear in the tracts as to quarters; for instance, I refer to the survey of Bon Homme Island, situated in township 93, range 58. Where there is a strip 77 rods wide, about two miles long in excess of what there should be, and the parties owning on both sides are now in vexed litigation as to who is the owner.

TIMBER.

As to this clause, my views I will give you in general. I should judge that, compared with other localities, this county is very well timbered, and an immense amount is being planted out, most of which is cottonwood, and appears to be best adapted to soil and climate, and high winds that prevail. As to questions 7, 8, and 9, I would place the matter in the hands of the local land officers, with instructions to protect the timber, and at all hazard prevent this unlawful cutting and appropriating gov ernment timber.

As to mines, I have nothing to say, and respectfully submit my ideas for your consideration.

Yours,

CHARLES T. McCOY.

Testimony of F. W. Pettigrew, of Flandreau, Moody County, Dakota.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. F. W. Pettigrew, Flandreau, Moody County, Dakota; real estate dealer.
2. Seven and one-half years, eight and one-half in the Territory.
3. I have acquired title to public land under the pre-emption and homestead laws. Am now cultivating 40 acres of timber under the timber-culture acts of Congress.
4. Ever since I have been in the Territory I have been constantly engaged in locating settlers and aiding others to acquire public lands.
5. In an uncontested case a party cannot acquire title to public lands for less than $500, and generally it costs more in a contested case. It adds at least $100 to the expense.
6. The department at Washington is too long a time in deciding cases of contest, much to the inconvenience of settlers. The system of making proof to sustain an entry is no better than the old way and ought to be abolished; it does not prevent fraud on the government, but costs the settler too much money to prove his title.
7. All the land in this county is agricultural and pastoral, no mineral or timber.
8. By geographical divisions.
9. The system of the survey of agricultural land is all right if it were properly carried out, but as contracts are now let the surveying is poorly done. The deputy surveyor should have the whole contract price for surveying and not be required to divide with the surveyor-general. The contract for township and subdivision section lines should be let to the same deputy and then his work should be thoroughly examined by a competent person. I have never known a case where the work of a deputy was properly examined and consequently the surveying throughout this country is wretchedly done.
10. The system is good if properly carried out.

AGRICULTURE.

1. The climate is adapted to the raising of all kinds of small grain, early corn, &c. The rainfall is more uniform as the country settles. The seasons are usually long enough to mature crops of all kinds. Snowfall in winter is usually light.
2. April, May, June, September, and October; largest amount in June and September. Yes.
3. All.
4. Artificial irrigation not practical.
5. None.
6. None.
7. Not necessary.
8. Irrigation is beneficial to gardens; crops can be raised anywhere but do the best on level land.

9 to 15. Not applicable to this country.

15. One acre for summer and 3 tons hay for winter.
16. Ten.
18. Increased.
19. No.
20. Does not apply to this section.
21. Good wells.
22. Ten.
23. Not enough sheep raised to make a test.
24. Yes.
25. Does not apply here.

26. Cattle 3,000; sheep 160.
27. None.
28. Yes, most assuredly; and those that can be found do not correspond with the field notes.

TIMBER.

1. None.
2. Cottonwood, maple, and ash grows thrifty. Cottonwood the best grower, from 2 to 7 feet per year.
3. Am not posted.
4. The remainder of these questions on timber I am unable to give any answers, as this is a prairie country and I am not conversant with the timber districts.

The questions on lode and placer claims I am not acquainted with, as this is is not a mining district, being purely agricultural.

These answers to the questions herewith are respectfully submitted by

F. W. PETTIGREW,
Clerk of the District Court, County and United States Deputy Surveyor, and Dealer in Real Estate.

Testimony of Thomas S. Sharp, farmer, Olivet, Hutchinson County, Dakota.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

To the Public Land Commissioner, Washington, D. C.:

Have lived in the Territory twenty months; a farmer, and have acquired a homestead under the homestead laws. Have closely watched the workings of these laws and the results to the settlers.

The time of obtaining a title is about eighteen months, in uncontested cases.

There are grave defects in the working of these land laws.

1. There has been much land passed to speculators and others through means of pre-emption and homesteading, under cover of actual settlement by those who took the land.

2. There is and has been much taking of land without actual residence thereon or in the community by the holders of the same.

3. The late amendment of the "timber culture" laws opened up the chances to non-residents, so that in three months after said amendments no timber-claims remained untaken for miles in advance of settlement. These claims are worked largely by agents.

The remedy, I think, would be to restrict the benefits of "timber claims" to homesteaders and pre-emptors.

Our country hereabouts is decidedly of the grain and corn class, though grazing is very successful. The land may be described as prairie, with very scanty and inferior timber on the James River, and is either bottom (alluvial) or table land, of generally level appearance and uniformity of soil.

Limit the amount of public land that one holder can possess to 160 acres and we should be better off. The real feeling of every one is to own all he can *and make his pile out of it in the future.*

The climate is fine and dry; rainfall inadequate, though usually sufficient to make good crops; the summer longer than in Illinois or Wisconsin, where I lived, and the actual and practical temperature higher than the weather records indicate, for our summers are more cloudless and night temperature higher than East.

The rainfall commences last of April and closes in September; June the rainiest month.

Our native timber would not equal the amount of 100 acres of good eastern forest; that is, all in our county.

The usual timber planted is cottonwood, the most rapid and hardy we have. Other kinds do very well. I am trying the locust, basswood, hickory. Our plantations are all under seven years of age.

The timber question will greatly affect our future welfare. The present laws are a wholesale damage to the region, and are not faithfully complied with; at least, in a majority of cases under my observation.

Absenteeism is another great evil, and in many neighborhoods renders the establishment of schools, &c., impossible, thus wronging the *bona fide* settler.

The land officers recognize the fact that much perjury is committed, which they say they are helpless to prevent. The officer at Yankton told me eighteen months since that a family of Russians took a number of sections (I forget how many), and that some who swore they were twenty-one he should have supposed were sixteen years of age.

Respectfully,

T. S. SHARP.

Testimony of F. Simpson, notary public, Kingsbury County, Dakota.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. F. Simpson, notary public, Kingsbury County, Dakota.
2. In county six months; in Territory eighteen months.
3. A pre-emption; shall make it a homestead.
4. Have been a locating agent all the time since I came to the Territory.
6. I think that 80 acres of timber claim should be given to actual settlers in same section beside the quarter section.
7. Land is rolling and smooth, mostly with a clay and lime subsoil, suitable for the best agricultural lands.
8. Can't say.
9. I think the present system the best ever can be or that has been, having an experience of fifteen years running lines.
10. None to make; only that I think one-half of each section should be timber claim, and for actual settlers.

AGRICULTURE.

1. Climate excellent; rainfall sufficient; usually five months without frost; but little snow; and no water for irrigation.
2. In the spring and first of summer, when most wanted.
3. All of it.
4. None of it.
5. None.
6. Can't say.
7. No supply.
8. Crops can be raised all over this county.
11. None.
12. All tillable.
14. No.
15. Two acres; the best I ever knew.
16. Can't say.
17. This county has only been settled this season.
18. Increased slightly.
19. No. Yes.
20. I think not.
21. Wells and some lakes and marshes.
22. I think ten is called equal.
24. Yes.
25. None here at present.
26. Corners are well marked.

Testimony of Karl Winter, farmer and county treasurer, of Olivet, Hutchinson County, Dakota.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

OLIVET, HUTCHINSON COUNTY, DAK.,
December 31, 1879.

1. Karl Winter. Farmer; treasurer of county.
2. Five years.
3. Homestead, under the act of Congress approved May 20, 1862.
4. Have had much experience in locating colony of Germans from Black Sea country in this and adjoining counties.
5. In uncontested claims, after making final entry, from four months to eighteen months have elapsed before patent is delivered at the local land office. The reason given, usually, for this delay, is "that they are behind their work at the department." The time between filing and offering final proof is regulated by law, and, of course, is as the law-makers designed it to be. In contested claims the duration of the contest is varied, owing to the time necessarily required for parties to produce the evidence, as well as to press of business in local land office. The expense cannot be stated. In uncontested claims the law regulates the fees and price of land. As to the party's "working" expenses while acquiring the land, they are as varied as to amounts as the amount of capital invested. Hundreds go upon their homesteads with nothing, and come out at the end of five years with a good home. How they get along in the mat-

ter of expenses during those years is a question that cannot well be answered, but they do it. Many others go upon their lands with some property and ready money enough to start well; but they come out at the end of five years with less than those who started with nothing. Pluck and business tact seem to be sufficient for any emergency, while a lack of these elements will soon make a rich man poor. From my varied personal knowledge, and from knowledge acquired from extensive intercourse with others, I am impelled to the above conclusion as to the "expense of acquiring public lands."

6. The public land laws are undoubtedly systematic and good. Their practical operations are not always equable; for instance: John Doe filed upon a homestead in January, 1874. His wife being very ill, it became a necessity for him to take her to friends and remain with her there for two years. He returns and finds his homestead jumped, and under the rulings of the land office he is not allowed to file a homestead a second time, and loses his right in consequence. The remedy for this evil should be set out in the law and not left to the discretion of land officers. In this case John Doe is not a lawyer, but an ignorant man, and did not know what steps to take, if any were necessary, to retain his homestead claim. Richard Roe did not do precisely the same as John Doe, but lost his pre-emption by a similar force of circumstances.

7. The lands of Hutchinson and adjoining counties are strictly prairie. They are destitute of natural timber and are all agricultural and pastoral.

8. The character of these lands is very uniform, and cannot be excelled for agricultural and pastoral uses.

9. The system adopted by the government could not well be improved upon.

10. It would be difficult to devise a better plan than the one employed at present.

AGRICULTURE.

1. Climate dry and healthful. Winters cold and dry. Sufficient rainfall in spring and summer for agricultural purposes. Average about 25 inches. But little snow in winter, the winds drifting it generally into ravines and hollows. The spring and summer seasons are sufficiently long to mature vegetables and grain. Not many fruits will endure the climate. Irrigation not practicable on the uplands. The streams are generally too much below the surface; but irrigation is not often desirable, and is never resorted to.

2. The rainfall mostly occurs in spring-time, but there are frequent showers through the summer. Rain seldom falls in autumn in any quantity. None in winter.

3. All cultivated without irrigation.

4. Never employed.

5. None.

11. None.

12. None.

13. See former queries and answers.

14. Not an acre should be sold at private entry.

15. Two acres. The grass is excellent.

17. Principally agricultural.

18. Increased.

19. Territorial herd law regulates stock-ranging.

20 and 21. Water supply from springs, creeks, and rivers.

25 and 26. Cannot tell.

27. None.

28. Posts all burned down years ago.

TIMBER.

1. None. Originally there was a little growing along the Dakota River, but it has nearly disappeared.

2. Cottonwood, ash, walnut, maple, and willow. Cottonwood is unquestionably the best. Some of the cottonwood has grown six or seven years, and presents a very encouraging appearance.

3. The timber lands should not be disposed of at public sale and only in small tracts, not larger than 160 acres to the person. To lease them would be only to give the lessees the power to rob the lands of their timber under a license. Saw-mills now cutting timber on government lands under the present pretense of paying for the "stumpage" is nothing less than an outrageous system of despoiling and swindling. They rob the lands of the good timber, and leave it in a condition that is uninviting to actual settlers. Saw-mill owners should buy the trees of actual settlers. This would give the settlers a new business enterprise and help them to secure a livelihood while making they new homes.

4. See No. 3.

5. I am very familiar with the growth of timber and its destruction from the Missouri to the Pacific. In rare instances a second growth comes, but not generally anywhere, for all over the West herds of cattle and sheep prevent the second growth from coming. In general, when the timber gets thin enough so that grass and undergrowth starts, it becomes very inviting ground for stockmen to range their stock upon, and the growth is ruined.

6. Cease granting the lazy, impudent, careless, and evil-hearted Indians the liberty of roaming at will all over the forests and prairies of the West and building their camp-fires along their trails, and the forest fires will be at an end.

7. The whole system is a system of destruction and robbery. No one should be allowed to cut the timber that does not belong to him.

8. The idea is outrageous. There should be no local customs of despoiling the timber lands of the government.

9. Either the land officers or United States marshal should have explicit orders to prosecute every violation.

Not acquainted with mining.

KARL WINTER.

Testimony of J. M. Howe, register land office, Lewiston, Idáho.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. J. M. Howe, Lewisten, Idaho, register of land office.
2. Eleven years.
3. One hundred and sixty acres under the pre-emption law.
4. Have been register nearly three years.
1. Richard J. Monroe, Lewiston, Idaho, receiver of United States land office.
2. Fifteen and a half years.
3. I have not.
4. Have been receiver nearly nine years.

5. Time, from date of proof; uncontested claim, from twelve to twenty months; contested claim, from three to —— years.

6. Yes. The pre-emption law for failure to define the character of residence; failure to make forfeiture of rights positive, upon non-compliance with the law; the homestead law; for failure to provide for the benefit of residence prior to date of entry; for failure to make the heirs the beneficiaries in case of the marriage of the widow; for failure to provide for a preference right in the contestant against an abandoned entry; and for allowing more than six months in which to make proof after expiration of five years' residence.

7. High rolling prairies, interspersed with deep and abrupt cañons, and bordered on one or more sides with timbered mountains; the prairies are fertile agricultural lands; the mountains densely covered with pine timber; the gulches, cañons, and streams abound in gold; the declivities afford excellent grazing.

8. First.—Withdraw all mineral, coal, and timbered lands from the operation of the pre-emption and homestead laws.

Second.—Provide for the complete survey of all lands at once, or at an early period.

Third.—Have four classes, viz: Agricultural, mineral, such as gold and silver; coal and valuable stone, such as lime; and timbered, without regard to humidity of climate, irrigability, or other physical characteristics.

Fourth.—The exact character of lands to be established by well-adduced testimony, as a matter of fact. The general assumed character to be returned as now by the surveyor-general, so as to put the matter upon inquiry.

9. The survey should be continually extended over all classes of lands in regular order. Surveyors, under the immediate supervision of the department, should be kept in field; the contract system should be abolished, for the reason that the easiest places are selected by the contractors, regardless of the value of lands, and arid plains are surveyed to the exclusion of fertile hills and valleys.

The complete extension of surveys is demanded by the rapidity with which immigration is at this time being carried on throughout the United States; the agricultural lands are fast being absorbed, and the timbered lands are needed for the development of the country; proposed railroad, some in process of completion, will form a network throughout the whole country, making available the remotest lands.

10. Allow to each person, qualified as a pre-emptor, 160 acres of agricultural land, to be secured under either the pre-emption or homestead law, whichever he may elect, but not allow both rights. This I should maintain is the intendment of the laws as they now exist, but construed differently. The timber-culture law might well stand it is at best a costly process of acquisition.

AGRICULTURE.

1. Speaking for this land district, I may say that the climate is variable regarding temperature, the valleys along streams are much warmer than the high prairies, and the rainfall and snowfall are less in the former than in the latter. Generally the length of seasons is: summers, comparatively, from March, seed-time to harvest, September and October; winters, frost and snow, December 1 to February 15. The rainfall has largely increased within the last four or five years, caused undoubtedly by the increased amount of cultivation. The water supply cannot be made available for irrigation, as it runs in deep valleys and cañons.

2. The rainfall occurs generally from October to March, occasionally commencing earlier and continuing later, thoroughly saturating the ground. Little or no rain falls after April until about October, when most needed, but all grain crops mature upon the moisture held in the soil.

3. All the agricultural lands can profitably be cultivated without irrigation.

4. Only small portions along streams.

5. All grain crops and most vegetables.

6. No experiments have been tried.

7. Rivers and small streams.

8. No accurate knowledge; know of one farm of 200 acres irrigated for the purpose of raising timothy hay, the process having been carried on for 10 years without perceptible injury; grain crops can be raised at altitudes of 3,000 and 4,000 feet.

9. The system of irrigation is not generally practiced, only isolated cases, therefore cannot give data; there are no restrictions placed on the use or waste of water.

10. No water taken up.

11. None.

12. One-twentieth part.

13. Pasturage lands should be classed among agricultural, and as such, subject to pre-emption and homestead under the general law, ultimately to be proclaimed for sale; should not deem it practicable to establish pastoral homesteads.

14. It would, doubtless, be advisable for the government to put these lands in the market, upon recommendation of the local officers, first holding public sale, at a minimum of $1.25 per acre; and the quantity should be restricted to each purchaser, in not more than 80 acres.

15. There are no statistics. I should judge from five to seven acres per head. I assert this to be the finest grazing country in the United States.

16. The product of ten good cows.

17. From five to ten.

18. Diminished.

19. No; cattle should be provided with feed in winter; they are, however, kept on ranges, though attended with some loss in severe winters, say about one out of three; they could be controlled by fences.

20. They would.

21. Mostly springs, frequently rivers and small streams.

22. Not more than three would equal one beef.

23. Diminished; they are very destructive to grass, grazing so close.

24. Yes, if forced to, but cattle dislike to follow sheep; it is bad economy.

25. The different interests are decidedly antagonistic, and laws have been passed restricting sheep-grazing within prescribed distances of occupied lands by settlers, but are looked upon as unconstitutional and remain obsolete.

26. Sheep, 20,000, and 5,000 cattle; sheep in herds of 1,000 to 2,000, cattle at pleasure, are not herded.

27. No further suggestions.

28. Serious difficulty; corners have nearly all been obliterated. I judge they were imperfectly set originally, being for the most part indicated by stakes driven in mounds, which have rotted away and otherwise been destroyed. I would suggest that they be relocated, so far as to place substantial monuments upon township corners and lines at least once in two miles.

TIMBER.

1. The mountains bordering the prairie country and extending almost interminably northward are covered quite densely with fine timber, mostly pine, fir, cedar, and tamarack. We might say one-half the land in this section of Idaho is timbered.

2. Cottonwood, poplar, locust, box-elder, and some nut trees; the latter are regarded as the best for timber, but are harder to cultivate; the poplar family is the easiest and surest raised, reaching one foot in diameter in six or seven years; the hard woods and nut trees would require twenty years to become serviceable.

3. Should hold the timbered lands from sale; should fix a stumpage value upon the timber, a price for wood; appoint a special agent for each district to collect the rev-

enue and to prosecute depredators. A very large revenue could be derived from this source, and it would work no greater hardship upon settlers to pay the rates in this manner, for the price of timber, whether bought from manufacturers who own the timber, buying the lands, or who buy it from government, paying stumpage, would be about the same; in fact, it comes out of the consumer anyway. By this method of selling the timber the lands would become cleared and are then valuable for agriculture or mining, and might be sold as such. Should laws be enacted for the sale of timbered lands, I should recommend that not more than 40 acres be allowed to each person and he to be an actual *bona-fide* resident within the land district comprising the land; 20 acres would be enough. The price of timbered lands should not be less than $2.50 per acre.

4. I should not classify the kinds, price, nor size of tracts.

5. There is to some extent a second growth, of no considerable value however, being mostly brush-wood.

6. Forest fires are occasioned mostly by carelessness of lumbermen, travelers, and Indians; they rage nearly every year during the dry period; are more destructive than all the depredators combined; the mode of prevention is by stringent Federal laws, to be enforced by a prosecutor in the person of the special agent before mentioned, who could make personal investigation and inflict speedy punishment.

7. The depredations upon public timber are extensive, being for railroad ties and timber, mineral, building, agricultural, and other domestic purposes. There is much unnecessary waste, especially trees that are suitable for shingles and shakes, the butts being used while the tops are left to waste.

8. Property in public timber, according to local customs, is conceded to be in the party reducing the timber to his possession.

9. They would not be, for the reason that they *could* not be so efficiently executed by the United States district land officers as they would by a special agent, a sort of *plenipotentiary* whose *sole* business should be the execution of the timber laws; from personal experience I can say that local officers *cannot*, even with full powers, attend to the business properly, and subagents under them are not satisfactory.

LODE CLAIMS.

1. I have had no experience.
2. From observation I should say that the defects are but few, if any
3. Have no data.
4. Have no knowledge.
5. Have no knowledge.
6. I presume there has.
7. I have not.

8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18 I cannot answer, as I have had no experience.

19. All district laws, customs, and records should be abolished and the initiation of record title be placed exclusively with United States land officers.

20. The adjustment of mining controversies should be left absolutely to the United States land officers in the same manner as contests under other land laws.

21. From observation I should consider it desirable to retain the leading features of the existing mining laws; I could not speak further.

22. Locators should be compelled on penalty of forfeiture to acquire title by purchase within a reasonable time, say one year.

PLACER CLAIMS.

1. One-twentieth, principally gold.
2. I am not.

3, 4, 5, 6, 7, 8 and 9 I cannot answer for want of practical knowledge.

Very respectfully submitted.

J. M. HOWE,
Register, Lewiston, Idaho.

RICHARD J. MONROE,
Receiver.

Testimony of E. B. Bonnelle, chief clerk to the surveyor-general of Montana, Helena, Mont., relative to rectangular surveys, monuments, and inspection by surveyor-general.

E. B. BONNELLE, chief clerk in the office of the surveyor-general of Montana, testified at Helena, September 27, 1879, as follows:

I think that the rectangular system, so far as it goes, is a very good one. I think

there is some room for improvement in its details. For instance, the monuments might be of a more permanent nature. I think there ought to be an inspection of these surveys, and I think there should be an inspection of mineral surveys as well as of agricultural surveys. The surveyor-general could do that if a sufficient amount were allowed to defray his expenses.

Testimony of Edwin H. Combs, farmer and stock-raiser, Madison County, Montana.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. Edwin H. Combs, Madison County, Montana; occupation, farming and raising stock.
2. Since June 17, 1863.
3. I have, under the homestead and pre-emption laws.
6. I think the present laws good enough when administered by just officers.
7. I have seen the greater part of the Territory, and think an average of two-thirds of the entire country is grazing, the balance timber, mineral, and agricultural.
8. The present laws are good, and any change would interfere with the already-acquired titles of those who have made this country what it is.
9. The land law, as it is, prevents to a great extent monopolies, and any change, I fear, would not make it any better.
10. In my opinion the present method works well for the interest of government and the poor man, and gives general satisfaction.

AGRICULTURE.

1. The climate is dry and healthy. Rainfall very light. The snow principally falls on the mountain tops, and consequently the streams are very high during the irrigating season.
2. The rainfall is mostly in June and July. Sometimes heavy snows fall in the valleys in May, but are warm, going off rapidly, without freezing nights.
3. Not any.
4. About one to ten.
5. Wheat, oats, barley, and nearly all the vegetables grown in the Middle States.
6. About 500 square inches.
7. From the creeks and rivers the supply is good. Montana is the best watered country in the world.
8. I think irrigation agrees with this alkaline soil. The altitude has not much to do with the season. Some of the large lower valleys are more subject to frost than those high up in the narrow valleys at an altitude of from 4,000 to 5,000 feet.
9. All the water is exhausted. The law forbids any waste. It is a mistaken idea to irrigate and return the water to the stream from whence it came. A field of 200 acres will absorb 1,000 inches for three months, or during the growth of the crop.
10. The waters of small streams is mostly claimed and used, but the one-thousandth part of large streams is not used. Each farmer is allowed the full capacity of his ditch, commencing with the first settler, until the stream is exhausted.
12. About two-thirds.
13. It is not.
14. It is not.
15. Other sections are better adapted to grazing.
18. It is fully as good as it was sixteen years ago.
19. Some of them fence in large tracts for winter pasture.
20. I think not.
21. From springs, brooks, and rivers, promiscuously and plentifully.
23. It has increased—become thicker.
24. They will.
25. Hostile feelings prevail wherever there are sheep.
28. There is none but a surveyor can understand the hieroglyphics on the buried stone, and the surveyor who established these corners resides in the Territorial prison.

TIMBER.

1. Timber is plenty, but very poor quality.
2. Cottonwood.
3. I oppose any disposition or restrictions whatever of timber lands. With but few exceptions the farmers go from 10 to 15 miles for timber, and climb the rocky sides of

the perpendicular mountains, consuming an entire day, for an inferior load. The main body of timber lies far up in the mountains, and government ought to pension the men who get it down.

5. With a few exceptions there is none. Groves of young Norway pine cut for fencing have grown again.

6. Fires occur from careless men camping out, hunting and prospecting. The law or punishment is both fine and imprisonment.

9. I think not. It would be impracticable.

PLACER CLAIMS.

5. They are defective. The present law allows it to be taken and pre-empted in large tracts, thereby securing a title from government. Consequently it is monopolized and held by capitalists to the detriment of the entire country.

Testimony of Uriah Bruner, attorney at Law, West Point, Nebr.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

5. On uncontested entries. Homesteads, including witnesses and their expenses, about $40, average. Some few made their entries, say for $25, while others, living at a great distance from office, their expenses have run up to $75. Timber claim, including proof, exclusive of the improvements that have to be made on the land, would be about the same as in homesteads. Fees in pre-emption entries is considerably less. Since I am out of the office I understand that the applicant to homestead and timber claims is required to give thirty days' notice by publication of his intention to make final proof. This is a useless and burdensome expense, which should be done away with. No one but the proprietor of the newspaper will be benefited by such notice. Contested claims are frequently very expensive to the contesting parties. The average expense of a contest is perhaps $40. Where no attorneys are employed and personal notice is given, the expense is sometimes reduced to about $15, but more frequently it will cost $100.

6. The timber law as it stands has several defects, in my opinion. It requires that 2,700 trees should be planted to each acre, and 675 shall be growing and be thrifty at the time of proving up (five and six years after same are set out). There should no more trees be required to be planted than there are required to be living and in thrifty condition at end of the eight years. No trees that are fit for forest planting will do well to be planted so close together. They will choke out one another, and while the fittest, thriftiest, and most vigorous will survive, it will yet be injured by those that have been killed out by the choking process. Trees in forest grow straight, with long bodies, but they are much retarded in their growth by being overcrowded. It is far better to plant the proper distance, so they won't interfere with the growth of each other by overcrowding, until they attain a sufficient size for purposes of poles and fire-wood, when the thinning-out process can be done by the farmer with profit to the forest as well as to himself. I have considerable experience in raising forest trees in planted groves, and my views I give here are from actual observation and practical experience. I believe that the claimant under the timber law should be required to plant 40 acres for every 160, and the number of trees required to be planted to the acre should be about 640, and the number at time of proving up to be about 500. That all homesteads and pre-emptors on prairie lands should be required to plant and have in growing and thrifty condition 10 acres for every 160, five years after the entry of the same, and before the passing of said entries for patenting—in homesteads the proof to be made at the time of final proof, and in pre-emptions and commutations the proof to be made five years after the date of settlements.

There are vast areas of lands in Western Nebraska and Kansas that are worthless for all purposes except for grazing. These, under proper restrictions, could be sold on condition that part of the same be planted in forest trees. Here care should be taken that the same be not sold in too large bodies to one person or company of persons. Rather have the government inaugurate a system of leasing (as they used to have in Australia) at public auction for a term not to exceed five years at a time. Great care will have to be used or large cattle-raisers will soon have a monopoly of all desirable grazing lands. In this land district (Norfolk) the lands are what is called *prairie*, with very little timber here and there on the edges of the water-courses and running streams. Most of the lands are good, rich, farming (agricultural) lands. There are yet large bodies of bad, sandy lands, nearly worthless at present except for grazing purposes.

13. I think that homestead, timber law, and pre-emption law should be left in force even in exclusively pastoral lands, until it is definitely determined that no homes will be made or farms opened any more. Cattle monopolists will undoubtedly clamor for an abrogation of the land laws on the plains. But we should proceed very cautiously in this direction. We should remember that this is the day for aggression by large monopolists of all kinds. Our government was established not with a view for enriching a few at the expense of the masses, but rather for the purpose of affording opportunities to the toiling millions to rise with the dignity of labor to a comfortable competence for himself and his family. It is the government's duty to see to it that all shall be brought up well, be educated in the rudiments of a good common-school education, and that this bringing up may be done by the *paterfamilias* without materially cramping himself. The question of social science is undoubtedly the most important that can engage the attention of statesmen, and the land question entering so largely into this question, is, perhaps, the most difficult to solve. "To move with great caution" must be our motto.

2. Time of growth, from May to September.

Very respectfully,

URIAH BRUNER.

Testimony of R. H. Criswell, notary public, Indianola, Nebr.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

INDIANOLA, NEBR., *January* 24, 1880.

Public Land Commission, Department of the Interior:

GENTLEMEN:—I laid away this paper in my drawer and forgot it, which is rather a bad apology, but it is true. I answer interrogatories seriatim.

1. Robert H. Criswell, Indianola, Red Willow County, Nebraska; lawyer.

2. Nearly seven years; I have perfected a homestead and am holding a pre-emption.

4. I have been doing land law business during the entire period of my residence here.

5. I had three years' credit as a soldier, and my homestead cost me $700, but I paid for my house and hired all my work; took about 40 acres and put in three crops. I have known men have nothing, not even enough to file on land, but get on it and in four or five years have quite a good property, such as a team, cows, hogs, poultry, and grain for bread. Contested claims, generally, in this region have not been defended, and the cost is $15 and $20 to clear them.

7. I am honestly of the opinion that this will be one of the best agricultural districts of the world, as well as one of the best fruit districts. I have seen the finest vegetables raised here, such as parsnips, cabbages, and beets, I ever saw. The finest wild plums grow here I ever saw, and plenty of wild grapes. Professor Aughey, of the University at Lincoln, said to me he would risk his reputation that this valley would be as famous as the valley of the Rhine for grapes alone. This will be a great fall-wheat country, and it only needs the wheat-grower to come with his plow and try it. I have not time to answer all your questions, but I do wish to insist that this is bound to be, par excellence, an agricultural country, and not a pasturage country, that is, a wild pasturage country, excepting, perhaps, in some few counties where the land is exceedingly rolling.

10. I beg leave to suggest that you cause to be amended section 2294 of the homestead law by striking out clerk of the County, and inserting any officer having a seal, such as county judge, notary public. As the law now stands county clerks oppress the homesteader by charging high fees, and the clerk here will not permit a man to make his own papers and be sworn and take 25 cents for the affidavit. He makes him pay $2 whether he makes out the papers or not. Can you not have this remedied?

I close by insisting that you hold these lands for the actual settler and homesteader.

Very respectfully,

R. H. CRISWELL.

Testimony of Joel Hull, attorney at law and real-estate agent, Minden, Kearney County, Nebraska.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

Referring to your list of questions and answers numbered in accordance, I have the honor to submit the following:

1. Joel Hull, Minden, Kearney County, Nebraska; attorney at law and real-estate agent.

2. Have resided in the State and county since March, 1872, nearly eight years.

3. I have acquired a title to a quarter section under the soldiers' and sailors' homestead act, and made an entry under the timber-culture act.

4. I have for four years last past been a practicing attorney before the local land offices in this State, and been engaged in securing entries for settlers, prosecuting contests for the abandoned lands, and attending to the making final proofs of claimants.

5. In uncontested claims my experience is—

For entry fees (double minimum lands)	$18 00
Attorney fees for making entry papers	2 00
Final receipts on proof	9 00
Notice of intention to make final proof	1 00
Publishing the same	3 00
Taking proof of claimant and witnesses by attorney or county clerk	3 00
Examining papers by register	1 00
Total expense	37 00

For contested claims, additional, from $15 to $30, under either the homestead or timber-culture laws.

6. In the relinquishment of timber-culture entries, the purchaser of the rights and improvements now sends to the land office his application for the tract, accompanied with the entry fees, his affidavit, and the relinquishment of the former occupant, which secured for him a prior right to the land. I would suggest the same rules and laws to be made applicable to homestead entries. By the present rules a purchaser of the improvements has no rights to the land, and often other parties succeed in getting places with valuable improvements that ought to have been secured by the purchasers of such improvements. "The first legal applicant" now gets such land, while the purchaser ought to have a prior right.

I would further suggest that the law be changed so that the affidavits to be taken, in making a homestead entry, can be made before the register, or receiver, or clerk of the county court, or other officer authorized to administer oaths, having a seal. The present rules designate none but the register, or receiver, or a clerk of the county court. A notary public or county judge are generally more competent and convenient to attend to the business than the county clerks.

I would further suggest that the same rules be made applicable to the making final proofs on homestead and on timber-culture claims where distance from the land office would be the reason specified, to wit, before the county judge or a notary public, for the same reason as above.

I would thus make the rules uniform in regard to pre-emptions, homestead, soldiers' homestead, additional homestead, and timber-culture entries, giving full power and authority to county judges and notaries public as well as to the county clerks to take applications, administer oaths, both in the affidavits required in making the entry and in making final proof in each of the above classes.

7. The county of Kearney, Nebraska, is a gently undulating plain prairie, whose soil is a black loamy soil from one to four feet deep, generally two to three feet deep, and from my personal observation the greater portion of the eastern half of the State is similarly situated, and suitable almost exclusively for agricultural purposes. The southwest quarter of the State is to a great extent also suited to agricultural purposes, a small portion only on the extreme western end of the State being more suited for pastoral purposes. The northwest quarter of the State is to a greater extent more suited to pastoral uses. There is yet no mineral developments in this State that is worthy of notice. The timber is exclusively confined to narrow belts along the streams.

8. It will be difficult to fix the character of these two classes of land by any geographical line or division, for even in the extreme western portion of the State, along the streams the land would be properly classed agricultural lands, while adjacent to them would be found considerable tracts of land not at all suited for agriculture, but only for pastoral uses. A general rule upon actual survey is the only way the character of the lands can be fixed without doing violence to the several classes. This may be and perhaps ought to be done by specially appointed commissioners for each State or Territory.

The claimants of land for pastoral uses often come in conflict with those wishing the same lands for agricultural purposes, thereby causing great and serious difficulties, disputes, and sometimes loss of life, and which can only be remedied by the classification by such rules and authority as will leave no grounds for such contests.

9. I am not a practical surveyor, but I think the present plan of parceling land is the best, most convenient, and economical for the agriculturist that can be adopted for that class of land suited for agriculture.

For the lands suited only for pastoral purposes I would suggest the parceling larger tracts of not exceeding four square miles to each owner and herder of cattle, not exceeding two acres to each beef animal occupying his tract claimed, and under suitable rules and restrictions.

The monopoly of large tracts by few men should be guarded against, and as the climate and amount of rainfall, as well as the character of wild grasses, seem to be undergoing a change continuously, more suited for agriculture here in the central portion of Nebraska, and west, it seems to me to be very unwise to finally dispose of these larger tracts until after several years has elapsed and the above-mentioned commissioners have reported several times the actual condition of several classes, and the probability of the lands in whole or in part becoming agricultural lands.

10. I cannot recommend any better system of parceling the lands or disposing of them to the actual settlers than the present existing land system. The agriculturist is, so far as I can learn, universally pleased with the present system. The conveniences of making application for the tracts, the making the rules uniform for the several kinds of entries, and the convenience also of making proof, guarding only against fraudulent practices I have already referred to. The cattle men are not so anxious to own in fee simple the ranges they can occupy as to be guarded in their occupancy *pro tempore*.

My suggestion would then be after the certain tracts had been once classified as pastoral lands, to enter under a leasing system for a term of years to men whose sole condition will be continued occupancy with cattle, upon the payment of a small entry fee, at the local land offices. Let that term be five years with priority rights to another five-year term. After the above special land commissioners have resurveyed, re-examined, and reclassified the lands, and reported the same to the General Land Department. It may require several of these terms to finally settle the character of most of the lands lying in the States of Kansas and Nebraska, and west of the one hundredth meridian.

AGRICULTURE.

1. Climate in the south half of the State suitable for all the staple cereals, including winter and spring varieties of wheat; nearly all the desirable varieties of corn. Potatoes and all root crops do well. Rainfall is all we can depend on, irrigation being impracticable on the great bulk of the lands. The rain has heretofore usually been sufficient for securing fair crops of all kinds, and averaging about thirty-two inches during the year.

2. The season of the greatest rainfall occurs during the months of April, May, June, and July usually, some years a little earlier, others a little later, and invariably has, for the last eight years, come at the season when most needed for agriculture.

3. All of this section of the State may be cultvated without any irrigation. The soil of the State being of such a formation that the moisture from rains on cultivated lands is readily absorbed and retained to such a degree that droughts of from three to four weeks seldom affect the crops deleteriously.

4. Very little. Not one-hundredth part can be irrigated from the superficial formation, as well as the almost total want of supply of water.

5. Therefore no crops are raised by irrigation.

6. The lands in the central and western part of the State lie at an altitude of 2,000 to 3,000 feet above sea-level, and the higher table-lands, or rolling prairie, seem as well adapted to crops as those of lower levels or along the streams. The experience so far seems to indicate that the high prairies are more productive than the bottom lands along streams.

12. None of the central part of this State can be said to be adapted to pastoral uses only. All may be cultivated fully as economically as to pasture the lands. As I before remarked, only a small proportion in the western end of the State can be so classed, and not exceeding one-twentieth of the whole State.

13. It will be extremely difficult to establish homesteads on pasturage lands; and on such lands as are found to be adapted to agriculture, it is my opinion no permits should be granted to more land than the homestead settler has. But on such lands as are suitable for pasturage and not adapted to agriculture I think it would be proper to adopt a system of leasing for short terms—say five years—to actual settlers, no greater amount than four sections to one settler, who shall have at least one beef animal to each two acres of his tract.

14. I would not advise to put these lands in the market for private entry at present, but rather hold them as before suggested, in trust for such uses. It is my observation that each year is developing a little larger growth of grass, and the very character of the grasses is gradually undergoing a change, some of the smaller grasses giving way to larger, coarser grasses, and each year is demonstrating the fact that a much larger area of the State is adapted to agriculture than has heretofore been supposed. The present system is a complete check upon monopolists getting control of large tracts of and, which is as it should be. Such lands, however, as are eventually demonstrated

to be adapted only to pastoral purposes may be then properly put on the market for private entry under suitable limits.

15. It is here taken to be fair to rate one beef animal, including the young, to every acre, but it being an agricultural section, and none making the wild lands exclusively their pasturage, taking up their cattle during the winter months and feeding them, it would not be fair to compare it with lands exclusively adapted to pasturage only. My impression would be that twice that amount would be necessary to each head raised and fitted for market on pasturage only.

16. About 200 head of cattle would support an average family.

17. But pastoral pursuit being engaged in by no one here exclusively, it would be difficult to compare the settled with the unsettled portions. Not more than four head to the section average in this county.

18. The growth of the grass for the past eight years in this county on the wild or uncultivated land has very sensibly increased. The cause, however, I attribute to the check put upon prairie fires, and that no great herds of cattle nor buffalo have ranged on them. The character of the grasses in my observation has also undergone a change. In the spring of 1872 in Kearney County and adjacent counties but little else than "buffalo" grasses were found on the high prairies, which are now covered almost entirely with the "bunch," "blue joint," and other larger and coarser grasses.

19. There being no ranges here, I cannot say but this—that when the homestead settlers come, the ranges are abandoned; fences, therefore, have neither been tried nor proven a failure. Fenced ranges may prove a success if they are not so expensive as to be impracticable. The method that would probably be adopted would be to have a suitable "corral" or yard to herd them in at nights or inclement weather, and watch them while out feeding.

21. The supply of stock water comes principally from wells. Those adjoining the small streams prefer to water their stock at the streams, but only for the convenience. The well water is considered fully as good as the stream water.

26. There are about 2,000 head of cattle and 200 head of sheep in Kearney County, but rapidly increasing with the growth of the county; these are in herds of an average of about six head in each bunch.

27. The present system is a good one and satisfactory so far. The surveys are in some few sections not quite clearly enough marked. The rules of entry and proof for the convenience and economy of the settler I have already alluded to. The corners are mostly found in a fair state of preservation. At some places, especially where sandy, it is difficult to find them, and in a few cases have to be re-established by county surveyors. A little charcoal or a charred post would have saved great trouble in a few instances if they had been used at the survey.

TIMBER.

1. There is no native timber on the upland of the State. None but the bottom lands skirting along the streams have timber.

2. The cottonwood, box elder, walnut, ash, the maples, and Lombardy poplar are the varieties mostly planted, and all are thriving and doing well. The hard woods, the oaks, hickory, and beech, it is thought, will succeed after the ground is shaded so that they will not be directly effected by the drying winds. Many of the more intelligent of our farmers are giving considerable time and attention to the growth of timber. There are no native forests in the State, but from the ready growth of forest trees, observant men think it can be made to produce trees readily.

Very respectfully, your obedient servant,

JOEL HULL.

Testimony of Evan T. Jay, attorney and stock-grower, Frontier County, Nebraska.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

STOWE P. O., FRONTIER COUNTY, NEBRASKA,
November 30, 1879.

To the Public Land Commission, Department of the Interior, Washington, D. C.:

1. Evan T. Jay, Stowe P. O., Frontier County, Nebraska, attorney and stock-grower.

2. Nine years in this State—seven years in Buffalo County, and two years in this county.

3. I lived seven years upon the southeast quarter of section 4, township 8, range 16 west, Buffalo County, Nebraska. I received a patent from the government under a soldier's homestead filing.

4. Since my removal to this county I have had a limited amount of land practice before notary public in land contest cases where, by stipulated agreement of both parties, the depositions were taken before a notary public.

5. From my personal experience I must say that my expense incurred in improvements and cultivation of my homestead were far greater than my profits, owing to the fact I lost most of my crops each year. By grasshoppers, drought, or hot winds from the south, I lost $3,900 trying to farm; then sold my homestead for $1,200, which was considerably less than my improvements cost. Had I devoted my time and attention to stock-raising instead of tilling the land, I might have made on the same capital, and during same time I devoted to improving my farm, eight or ten thousand dollars. While trying to farm I kept a small herd of cattle which brought me a handsome income. My experience has been: the cheapest mode of acquiring title toland will be to plow just as little of the ground as possible, reserving the remainder for pasture and hay.

Contested land suits are often very expensive luxuries, owing to the amount of spite and revenge under which the contest was commenced. I assisted one of my neighbors in taking testimony before a notary public last month, which continued six days, having 76 pages of legal cap written full of evidence, all about a 40-acre lot which, if sold under good title, would not bring more than $1.25 per acre. The plaintiff in the case paid over $50 expenses, and has no positive assurance of getting what all agree to be justice to him—that is, the right to this disputed 40 acres. The cheapest contest—publication and other fees are about $25.

6. In the case above stated the plaintiff, a poor man, who had lived in this county five years, had undergone the adversities of grasshoppers and drought, but was enabled to starve along, living off of the increase of a small herd of cattle, selling the steers and making butter from the cows. About eighteen months ago he purchased the land-office receipt given to one W. F. Owens, who abandoned his claim and moved to Iowa, leaving his homestead papers with a neighbor to sell, if possible, for the amount already paid at the land office. Mr. Nolan purchased the papers and proceeded according to law, and had the first filing canceled after receiving notice from our district land office at Bloomington. The above-mentioned plaintiff proceeded to the county clerk's office and made his homestead filing upon this disputed 40 acres, and three-fortieths of his first selected claim—making the exchange of 40 in order to better the condition of his home. His papers were sent to the land office by mail. In a few days Mr. Nolan was notified that his neighbor had placed a soldier's filing on the whole of this contested 160 acres in the name of a party living in Iowa. This neighbor of Mr. Nolan's has an old grudge at Mr. Nolan, and in order to assist his revenge had succeeded in having this filing placed upon this land before Mr. Nolan's papers were received through the mail. All this resulted in the above contest, which cost Mr. Nolan $50 in cash, the law being such that the plaintiff, on an appeal suit, had to pay for the taking of all the testimony. I consider that if the laws were so amended as to allow the persons who, in good faith, contest some prior filing to a tract of land, and succeed in securing the cancellation of the same, that a sufficient time should be allowed that particular individual, say thirty or sixty days, to perfect his *individual* filing upon said land. The present rule being, the first application made after the cancellation is returned receives filing. Said rule results in most cases in innocent parties having to be greatly wronged, and compels them to expend their hard-earned money or lose their homes, which, in many cases, *constitute their all.*

7. The quality of our soil is a rich yellowish loam. The quality is excellent, and would produce all kinds of vegetation if rainfall could be furnished at proper intervals. The altitude of this country is very high. Except on the creeks and their tributaries, a distance of from 100 to 180 feet is necessary to dig in order to get water. Upon the margin of our streams a small amount of timber is found—white ash, cottonwood, and box elder.

8, 9. I have not had access to the act of Congress referred to. Would be much pleased to have it. I do most undoubtedly believe, from nine years' experience in Western Nebraska, that if our national Congress would enact a law by which all the territory in Nebraska west of the 100th principal meridian should be exclusively devoted to stock range, that a far better revenue would be derived than by trying to introduce agriculture into any portion of this territory. The citizens of this county, some five years ago, after having tried to prove this a farming district and failed, voted by a unanimous vote to abolish the herd law; and since that time this county has gradually settled up with a class of small stock-raisers, who are able to own from 50 to 500 head of cattle. Owing to the surrounding counties having herd laws, large stock-owners have not crowded our small ranges. The result is that this county has good live common schools. Our county does not owe a dollar of indebtedness, and we have a handsome little fund in the hand of our treasurer, (The said office I now have the honor of filling), while, on the other hand, the counties surrounding us are in debt; their county warrants only command 60 to 75 cents on the dollar. We have a few citizens in this county who still try to farm on a small scale. Their living is made by hauling

wood 30 miles to the railroad, and selling it for $4 per cord. Last season the hot winds from the south and the drought together rendered their crops a failure. Many of them will have to be supported by our county poor fund this winter or suffer.

This, I presume, is all out of place, and not at all what your honorable commission wish to hear, yet I am willing to make affidavit, and can furnish you sworn testimony, even from many who have tried to farm, that this above statement is correct. Yet under the existing land-office laws many poor men are led to come into this far western district for the purpose of trying to make a home and a living by cultivating the soil. Most cases have resulted in these parties returning again to the East, preferring to live on rented farms and give half of their crops rather than lose all here.

Our railroad companies have advertised their lands through these counties as being very productive, and many have been induced by reading these exaggerated accounts in eastern papers to move west, and in most cases have been disappointed, and have allowed their land purchased from railroad companies to revert back again, with all improvements and expense, to the companies, in order to again move east to a more productive climate.

I am convinced that if your honorable commission were privileged to visit Western Nebraska in person, that you would all join in pronouncing my theory as to the disposition of the greater portion of that lying west of the 100th principal meridian only adapted to stock raising.

10. By dividing this section of territory into small tracts, say from one to ten sections, and surround it with a provision that would protect the stock-grower, and the greater portion of the land could be sold by the government for fair figures. As to the homestead, pre-emption, and timber-culture acts, they are satisfactory, and in agricultural portions of the State are recognized as good, owing to the fact that speculators in real estate are barred out. Under the new act, allowing citizens additional 80 acres, I think the act should allow the location of that 80 acres wherever found, and not require the annexation to the first 80; much inconvenience is caused to those entitled to the additional 80 acres.

AGRICULTURE.

1. Climate is pleasant and healthy. Rainfall, if at proper seasons, has been for the last two years in sufficient amount to have produced all kinds of vegetation. The hot winds and the drought usually set in at the time wheat and corn most need the rain. Early spring commences very favorably, but the season three times out of five results in drought and hot winds.

3. Owing to the high altitude of this county irrigation is utterly impossible. Our county lays between the Platte and Republican Rivers.

12. At least one-fourth of this county is only susceptible of agriculture, or of cultivation by plowing. The remaining three-fourths is hills, cañons, and rough, broken highland.

13. I think the past has proven that the homesteader should fence from ten to thirty acres for a "truck patch," or for raising millet hay for his ponies that have to work in winter, and leave the remainder lay out for free range pasturage.

14. Answered in answer 10, as I view the situation.

STOWE, FRONTIER COUNTY, NEBR., *December* 29, 1879.

To the Land Commission, Washington, D. C.:

I was unexpectedly called from home, and am of the opinion that the above will be too late.

I have written to the Department of the Interior repeatedly, in order to get the land-office laws and blanks necessary to be used in assisting settlers, and also for the purpose of *posting myself* on the laws relating to public lands.

My dear sirs, I will remain under lasting obligations if you will send me a full outfit of laws and blanks, or cause the same to be sent to me.

If you desire anything further, relative to your interrogatories, I will be pleased to assist. Hoping to hear from you, I submit the within.

I am, very respectfully,

EVAN T. JAY,
County Treasurer, Frontier County, Nebraska.

Testimony of D. L. Bliss, H. M. Yerrington, S. H. Day, and Judge Beatty, at Carson City, Nev.

D. L. BLISS made the following statement:

I am a member of the Tahoe Lumber and Fluming Company, which is perhaps more extensively engaged in the lumber business than any other concern or person in the

State. Most of our lands are around Lake Tahoe, in the counties of Douglas and Ormsby, and a small portion in Washoe County, Nevada, and some in California. We have title to most all of it. We have adopted the practice of buying the land, cutting off the timber, and then abandoning it, in order not to have to pay taxes on the land. The land in Nevada was located by the State. We got parties to take it from the State—320 acres each. We didn't lay in scrip in this State. All the land we got in this State was selected by the State, and we had no difficulty in getting our title. We don't use any timber on the public lands.

Nearly everything around the lake is bought up or taken up. Until recently on the other side of the lake we have only taken such timbers as would make logs, but lately we have cleaned off not only what was fit for logs but what would make wood. At first the cutting off of the timber increased the chances of fire, because we left the dry limbs on the ground, but after we commenced to utilize the limbs for cord-wood it decreased the chances of fire.

I am unable to say how long it takes for a second growth to grow up. If all the timber was off the hills it would take a very long time before new trees would grow up. It is of very slow growth. Fifteen or twenty years won't make much of a tree. Some trees we cut are 200 or 300 years old. I think we cut one that was 1,000 years old. It was 11 feet in diameter. In Montana it is said the majority of the trees cut are 150 years old, and that they are rotten at the heart, but that is not the case with ours. The majority of our trees are from 150 to 350 years old.

We have yellow pine, sugar pine, and what they call bull pine or black pine, which is least valuable to timber. Then we have red and white cedar and red fir. The latter is generally rotten for eight or ten feet at the root, called churn bottom.

From all my experience in the timber business, I think the goverpment ought to sell its timber lands. I would grade the price. I would have some man that understood the business to value the land by section or quarter-section, and I would sell it in unlimited quantities.

We couldn't sell lumber within $10 per thousand as cheap as we do now if we were limited in quantity. We have got to have a large quantity in order to pay any profit on the improvements. I think private ownership best conducive to the protection of the timber. The agricultural lands that I know of are not contiguous to the timber lands. We buy as much timber from parties who have taken up 160 acres as we do timber land. I would as soon buy the timber in that way as any other.

Land is nominally sold for $1.25 per acre, and we can't get hold of land unless it costs us from $3 to $3.50 per acre; and we would just as soon pay the difference to the government as to somebody else. Instead of that the government gets $1.25 per acre and somebody else gets the balance. There is too much red-tape about it. If you want to use the land in the next two years, you don't know whether you are going to get it in that time. They do not plant any timber in this State. I do not know how much of the area of the whole State is timber. I can make no suggestions about the timber lands other than I have made. There ought to be less red-tape about getting titles, and I don't think it makes much difference how the land is sold. I would just as soon buy timber of a man who owns 160 acres, as far as the price is concerned, as to buy it from the government. Of late years we have got pretty particular in this—that we don't buy any timber unless we know the parties own the land. We did used to buy without regard to that question.

Mr. HARRIS. I will add another suggestion or two: I think all scrips ought to be abolished; I think that the mineral lands should be sold without reservation, and that the miner ought to have the timber that grows on the mineral lands. I think there ought to be a uniform method of publishing the decisions that are made by the department in land cases, as long as they insist upon the land officers performing judicial functions.

H. M. YERRINGTON made the following statement:

I am the superintendent of the Virginia and Truckee Railroad Company, and engaged in the timber business. I think the timber-lands ought to be sold, if the government is desirous of getting its money and preserving the timber. They should be sold in unlimited quantities. By the introduction of the flumes which we use in these mountains, it takes a large aggregation of lands and all this sort of thing to make the business profitable, and the result of it is that these little fellows (small owners of timber-lands) they can't make it win, because a flume costs half a million dollars, and that's the reason why if they are going to sell wood at a profit, they must sell it in large quantities. Our wood is scattered over an area of 50 by 70 miles; we have about 75 miles of flume, that cost about one and a half million of dollars. The timber has been cut off so closely at all convenient and accessible points that it won't pay a poor man to haul it.

When I first came here, in 1863, wood was growing within three or four miles of Carson; it was hauled by teams to Virginia City, and was worth about $70 per cord; at that time the consumption amounted to only a few hundred cords annually. When

we started in, the demand was increased to 200,000 cords a year, and teams couldn't do anything, because they could not make it pay, on account of the expense of hauling. With the increased demand the price of wood fell. Here are thousands of acres worthless unless you can get at this timber by means of these flumes. If it were not for the flumes, instead of using wood they would go to Wyoming for coal. That is the reason why I say if I were the government, I would sell the timber-lands in lots to suit customers.

Mr. BLISS. When the wood was carried by teams (which was about one-half the distance it is now carried by railroad) we used to get $35 or $40 a thousand for lumber in Virginia City; we are now selling it for $17. I am speaking now of square mining timber. At present we are now bringing wood from California on a narrow-gauge railroad in the mountains, then through the flume, thence by railroad to Virginia City, for $9 per cord. In Lake Valley, California, when we first went in there, they were then talking monopoly, and called it the Bank of California concern. They said we were going to grab up the whole country. Now I believe they are glad we got in there, for I believe there is not anybody else doing business there. About all the money they get, they get from our concern. The parties who own land there are not able to get lumber to market themselves. They depend on us to buy their logs and timber. They can't get it to market and sell it at the figures we do and make money without investing a large amount of means.

I do not think it is practicable to give to a person 160 acres of timber land for a homestead, with the proviso that he should cut timber thereon and live upon the proceeds. One hundred and sixty acres of such land would not support a man as a continuous thing.

Mr. WRIGHT here suggested that people had been in the habit of filing pre-emption claims on timber land, cut the timber off, and then abandon the filing.

Testimony of S. H. Day and others, Carson City, Nev., relative to the survey of timber lands, cutting of timber, irrigation, pastoral homesteads, rainfall, sale of timber lands, arid lands, agriculture without irrigation, lien lands and mining school.

Mr. YERRINGTON. We have got all the timber lands that we want, and it don't make any difference to us what laws you pass on the subject.

S. H. DAY made the following statement:

I have been deputy surveyor-general of the State for nine and a half years. I have read your circular on the subject of lands, and have made up my mind to answer it. In my judgment, in regard to the timber lands, one drawback has been that they have not been surveyed promptly. At Eureka, for instance, the timber was all cut off before the survey was made. About the only timber fit for lumber is found in the Sierra Nevada Mountains. In other portions of the State it consists principally of fir, juniper, mahogany, and nut-pine. In regard to irrigation, I think under the present system all of the water in the State that can be used for that purpose is now utilized for irrigation.

Governor KINKEAD. I think that by using the proper appliances and having money enough to do it, the waters of Truckee River could be made use of to reclaim a large amount of land. I have heard of a scheme for diverting water out of that river to irrigate about 200,000 acres of land, but it would cost, I am told, $250,000 to do it. Upon this timber question, last fall I was in the southeastern part of this State. I was pleased at the immense tracts of juniper and nut-pine which I saw there. They grow on, two or three feet thick, all the way from Eureka down to Pioche, but the valleys are dry. I think the idea of a pastoral homestead a good one.

I have been in Nevada ever since it was Nevada. I think the rainfall is about the same now as in early times, except that we have had a series of dry seasons for the last three years. There is not anything in respect that can properly be called timber except in the Sierra Nevada Mountains. I would sell those timber lands, perhaps, in unlimited quantities. The accessible part of this timber in Nevada has been already cut off, and it requires combined capital to get it out. In other places it has not been done to that extent. It is getting worse every year. I think these lands ought to bring $2.50 per acre. I think it would be injudicious to pass any law with regard to arid lands which would drive the great herds of cattle out of the State which are now being pastured here. I don't think as a general proposition there is any particular conflict between the grazing and agricultural districts. I do not think the State is overstocked. Some portions of the State were overstocked last year on account of the dryness of the season, but it is not overstocked for ordinary seasons. In some places, as in Truckee Valley, they raise very good crops without irrigation.

We have some Indian reservations in the State, but there are no complaints about them. I am in favor of Congress granting to the State a smaller quantity of land than she is entitled to under the sixteenth and thirty-sixth sections, the lien lands to be selected by the State.

The State University at Elko does not amount to a great deal as yet, but we could establish a mining school with the proceeds of these lien lands, and it would be the best in the world, if properly provided for. It ought to be established at Carson or Reno, or anywhere contiguous to the Comstock. Such a school would have the finest advantages in the world, and I think the general government ought to foster an institution of that kind. It should have professors of high character, and official reports be made by them of the condition of the mines and tests of machinery. I think that would do more good to the State of Nevada than anything else, and to the country at large. This is the proper place for such a school. Here the scholars could have access to the mines every week, and receive practical education.

Mr. FASSETT. The only matter that I care to say anything about is that memorial that was forwarded to Congress during the last legislature concerning lien lands in place of the sixteenth and thirty-sixth sections.

Judge BEATTY. Upon the subject of square locations of mining claims, I might say this: It is a system that has never prevailed in this country, and I don't know anything about it. The old method of location under the local rules of miners was by posting a notice at the point where the ledge was discovered or near the ledge, and that, by the rules of miners, held a claim whichever way the ledge might run for the distance of the claim. Usually, by most of the local rules I am acquainted with, they had ten days in which to record the notice, and that held the claim as long as the requisite amount of work was done. The notice was recorded in the local recorder's office. That was the whole system. It was the means of taking possession without taking possession. This was changed by the law of Congress of 1872, and we now work under that act, still recognizing as being of some validity the rules and regulations of the miners in regard to certain things, such as posting the notice and recording the claims, the width of the claims. The act allows the local rules to restrict the maximum width within 600 feet.

In regard to square locations—that is to say, locations confined to the surface lines in the form of parallelograms, a system under which the miner would not be allowed to follow the ledge beyond his surface lines, I will state that I believe it would be a very unpopular system among the miners. But there are advantages in that system. I have always doubted whether we did wisely in abandoning the Spanish system of location, but the miners are firmly set in the present system. The present mining law of Congress was framed by the Representatives in Congress from this coast, and it was passed with reference to their ideal ledge, and it has now to be applied to a great many formations that it never was passed with any reference to. I think there is decidedly less litigation under the system inaugurated under the act of 1872 than resulted under the old system.

Testimony of Edward R. Chase, farmer, Wells, Nev., relative to public lands, agricultural lands of Nevada, laws, homestead application, local land officers, contested location, railroad lands, pre-emption, homestead patent, and claimants.

WELLS, NEV.

GENTLEMEN OF THE COMMISSION: Having been a resident of Nevada since it was a Territory, a practical farmer, engaged exclusively as such for the last twelve years in Eastern Nevada, and somewhat familiar with our land system, I venture a few suggestions looking to the simplification and economy of the means of getting what remains of our public lands into the hands of *bona fide* settlers, &c.

1. We were grievously wronged in this, that our lands within railroad limits was raised to double minimum. The rule that the lands nearest the road were enhanced in value by the road is reversed with us; the agricultural lands of Nevada become more valuable as you recede. This is a patent fact, and is owing to the following causes: The market for our produce is found in the mining towns. They are off the road. We have little or no occasion to ship grain by rail, and on all occasions when grain brings a fair price the railroad company enters into competition with us. At this time they are delivering hay in Elko for $80 per car, of 20,000 pounds, while I have lying before me their letter, asking me $320 more for a car-load of tools for farming delivered to me from the East than they charge to Sacramento. Freight on goods from the West here is about 2½ cents per pound; on hay eight-tenths of one cent.

2. There is no present reason for "sticking us" with double fees and commissions. A township of land in Nevada is not on an average of the intrinsic value of one section in the Northwestern States.

3. The law ought to be so altered that any person living 50 miles from a land office can do his business before any officer authorized to administer oaths living nearest

him. If the reason heretofore given, to wit, to prevent fraud, is the excuse for continuing it, I think it no sufficient reason. It is surely more difficult to perpetrate a fraud of that kind in the immediate neighborhood where the facts are known than at the land office where they are not known. Why a homestead application must be made at the office when the final proof is permitted to be made at a distance is difficult to understand.

4. I have a suggestion to make, which will not only overcome all the objections as I believe which can be brought to the above, but will prevent many frauds. Make it the duty of the register to furnish an abstract of each week's doings for the local weekly; those interested in lands would keep posted; keep a broad light of that kind turned on the proceedings of the land office and there would be less villainy.

One of the chiefest hardships we are subject to is the extortion of the officers of the local land offices. While it is made a crime and cause of removal from office to ask or receive more than the scheduled fees and commissions, the land officers are permitted to practice as attorneys in any case coming before them, and to charge all they please for such services. In one case, I know that an agent sent in an application for a soldier's homestead; the register objected to the form used, made out new paper, and charged and received $30. I believe the fee, &c., is $13. In no case should the officers be permitted to charge for attorney's fees for practicing before their own tribunal. Allow $1 for filing out pre-emption or homestead papers, and limit other business to a certain sum per folio.

There are several errors in the rules of practice.

1. It is simple nonsense to pretend that when a hearing has been ordered and a location contested by a person, that after the vacation of the contested location, every or any person has an equal show to locate the lands. The officers of the Land Office always disclose the fact to their friends, and it is just in my opinion to give the preference to the party who has been to the expense of showing that the location was improperly held.

2. It is no less against legal precedents than it is against the equities of trade to compel a person defending his location and sustaining his claim to pay half the costs. A friend of mine has just paid $50 in gold to the receiver to defend a desert land claim of 80 acres, where there was no appearance of fraud, wrong, or injustice. He sustained his claim at a cost of twice the value of the land.

3. The law should make some provision for prosecuting an inquiry into an alleged fraud. Here is an instance: One Francis Honeyman attempted to obtain a homestead patent on lands he had never lived upon or improved. He procured final proof, stating that he had lived upon the land the requisite time; had fenced and cultivated 140 acres; had put on $800 worth of irrigating ditches. The case was passed and ordered to patent. I learned the facts in the case and informed the department. They insisted on my taking witnesses at my own expense before the land office to show the fraud, and informed me that they had no way of getting the facts in such a case unless witnesses would come forward on their own motion and at their own expense and establish them.

The farmers living within railroad limits think the lands withdrawn from market for railroad purposes ought to be restored. We believe by a strict and fair legal construction of the railroad act of July 1, 1862, these lands tendered the company were tendered as a gift. Section 6 recites as the condition of the grants that the company should keep up the road and telegraph lines, so as to pay their cash obligations to us, in part, by transmitting messages and carrying mails and munitions of war. Their obligation to carry, transmit, &c., for us begat the necessity of keeping up repairs, &c.; in other words, there was no consideration money from the grantee to the grantor for the lands. It was, then, in law a gift. The law of gifts is that it is essential that it go into effect immediately. If it is to take place in the future it is only a promise, and, being without consideration, the law will not enforce it.

It is evident the government considered it a gift, and to take place immediately, because the bill fixes the time when they shall take the lands. By section 4 it declares that when a certain number of miles is completed and properly certified, that "then" patents shall issue to them for the 12,800 acres per mile for each completed mile. The word "then" can by no possible legal or grammatical construction relate to anything but the time when they should take what lands they wished or intended to under the grant. Government would have no constitutional right to give an indefinite period of time for them to accept these lands, and it is not to be presumed that they ever intended to exercise it. They hold these lands in trust; they are restrained in the disposition of them to the exercise of that trust within the limits of the common good and "general welfare." By the act of July 2, 1864, section 21, it was made a prerequisite that the company should pay for selecting, surveying, and conveying; but by no possible construction could it extend the time. The only reason that the Territories through which the road was to pass gave their support to the measure was that the lands were to be conveyed then—immediately—and would go to relieve them from the burdens of sustaining their municipal machinery by their taxation. That

act (the railroad act) was a tripartite contract. We the people were, by language clear and comprehensive, to have the privilege of buying all the lands not sold at the end of three years, at $1.25 per acre; that is, all of us that were eligible to pre-empt. We have the right to demand of you that these lands be in the future subject to that obligation. Whenever we offer to tax these lands they tell us they have never accepted them. When we offer to pre-empt, the land office takes our declaratory statement, incloses it in an envelope with a prepared affidavit, and addresses it to the perjury department of the Central Pacific Railroad, and it comes back and is received as evidence that the lands have not only been accepted, but sold or conveyed. We hope this commission will change this in some manner so that we shall be relieved from the shameful spectacle of seeing the general government asking of the Central Pacific Railroad Company what disposition to make of the public lands.

The plea of the railroad company is that these lands have all been mortgaged to one of their number, and that the mortgage is a conveyance; and while they claim that we cannot tax the lands, the mortgage goes unrecorded and untaxed, and we carry double loads of taxation in consequence of it. While the improvement of our lands adds in an equal ratio to the value of theirs, their lands remain unsettled, depriving us of communities sufficiently dense to have schools or social organizations of any kind.

The Secretary of the Interior, awhile ago, made a feeble effort in our behalf by declaring, I believe, that all lands held by the company were subject to pre-emption. Will you for me give him the legal information that the bill reads: "All lands not sold or otherwise disposed of at the end of three years after the completion of the road shall be subject to settlement and pre-emption like other lands, at $1.25 per acre;" and that it makes no difference how many times it has been sold since, it is always subject to settlement and pre-emption until it has been so taken, let whoever pretends to own it. No number of conveyances from the railroad company could convey to the holder any greater right than the railroad had; and if these patents do not so read, it is a reprehensible negligence on the part of the Commissioner of the General Land Office. It was at best a limited grant. It would look much more manly in the Land Office to accept of a filing on railroad lands, and leave the company or the grantee of the company to enforce his rights in the courts, than the present course.

While we have a thousand wrongs to complain of, they mostly relate to the maladministration rather than defective laws. I am constrained to believe that General Williamson is totally unfit for the place he occupies. He appears to have no sympathy in common with the people; every ruling has been adverse to them. He throws every obstacle in the way of their getting their lands. I believe it is the most sacred trust now left with the government. The pride and strength of every nation is in its farmers, those who till the soil they own. It is the only clear pathway out of this labor problem. I am somewhat familiar with the people's wants and necessities. I have lived twelve years on this homestead claim. I have tried for the whole time to obtain a homestead patent. At every step I have been thwarted by him and those acting under him. I have had my claim held up twice for two years and over on some trivial question. If I, without laches, without any charge or suspicion of unfairness, have to push away ten years, and at a cost of more than the government price of the land, am still kept at bay, what show is there for those less acquainted with the forms of business? Many, many have thrown up in disgust, and made recent purchases under the desert act. It should be the care of the Commissioner to help these lands into the hands of honest homestead claimants, and to guard them in every other quarter. He was appointed and is held in his place by railroad influences, and we have no mercy at his hands. If your commission can wrench anything away from his grip for the people, God speed you.

Regretting that my time (owing to farm labors) has been so limited that I have not time to rewrite and to give more point, if possible, to some positions I have taken, I will ask possibly the privilege of supplementing this, if I think of more that is important to be said. I would like to take one of your commission through this country and get the history of each claim. I think the Indian ring is humane and beneficent beside that of the Land Office.

In haste,

EDWARD R. CHASE.

Testimony of E. C. Hardy, stock-raiser, Elko County, Nevada.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

STATE OF NEVADA, *County of Elko.*

To the Department of Interior, Public Land Commission:

HONORABLE SIRS: I hereby acknowledge the honor conferred upon me by the receipt of your circular of questions affecting the interest of the people of the Western States and Territories in way of disposing of the public lands.

PREFACE.

I am strictly an uneducated man. You will, therefore, overlook all parts of my report that would be bettered or finished by the advantages even of a common-school education.

I will only state facts plainly as they have appeared to me in the course of my practical experience. Any further details I may make than answering direct questions will be for the purpose of explaining my ideas, or for the purpose of giving you a knowledge of the experience I have had in the subject-matter, as will appear, for example, in reply to first question in your circular. My report will be short and positively within my own experience on the Pacific coast since 1852, twenty-seven years.

Name, Ebenezer C. Hardy; born in Haverhill, Mass., June 8, 1835. Parents emigrated to Wisconsin in 1842. I came to the Pacific coast (Oregon) in 1852, where I acquired land under the old "donation law," with which I became familiar. In 1864 I sold goods and mined in gold placer in Grant County, Oregon, where I became acquainted with the regulations of locating placer mines.

In 1868 I moved with my family to Boisé City, Idaho Territory. I was with S. M. Wessels, first locator of lead ores bearing precious metals. These locations were made in Owyhee County, where I first became acquainted with that kind of ore bodies or contact veins. I have carefully observed the mountain timber interest of the various commonwealths. I was one of the first locators of Ward mining district, in White Pine County, Nevada. I moved with my family to Nevada in the fall of 1872, and have resided here since. My occupation at this time is growing sheep, cattle, and horses.

3. I acquired title to 160 acres of land, and my wife, Mrs. M. H. Hardy, to 160 acres of land, under and by virtue of an act of Congress approved the 27th of September, 1850, commonly known as the "old donation law." Said land was situated in Skamania County, Washington Territory, certificate No. 112, issued by Andrew Johnson.

4. Answered in No. 1.

5. I settled on the donation claim August 11, 1855, and obtained patent December 22, 1865, being ten years. This was an uncontested case, no conflict of title or of lines in any way. I think my expenses were about $25, besides a private survey I had made to guide me in making my fences, as under that act of 1850 as amended our lines had to be run north and south and east and west. I think my neighbors received patents about same time. We had to live four years on the land in compliance with law. Thus, you see, we were six more years obtaining patent. Contested cases, such as Salem town site, Salem, Oregon, and Upper Cascade Landing, at the head of Cascade Falls, Bush *vs.* Bradford, in Washington Territory, much longer.

I consider the "donation law" and the "homestead act" the best for the actual settler and the best for the commonwealths of any laws that are now or ever have been in force: For the settler, because when poor he acquires a home at a time when he has no money to pay for one; to the interest of the country, because the offer causes some to engage in agriculture that would not otherwise do so, and agriculture is the foundation of civilization. It attracts industrious actual residents, who all have the one object of making homes, and no necessity or opportunity existed under these laws to mortgage them for purchase money. A settler under these circumstances would improve his place without fear of losing; could thereby contribute more largely and confidentially to the support of common schools, roads, bridges, and public buildings, churches, literary, scientific, and charitable institutions. I would say here that probably but few Eastern men can realize the responsibilities that are, by force of circumstances, thrown on frontiersmen in general. I consider they have double to do besides paying for their land; generally have Indians, and Indian agents, and military officers all against them, because the settler is really the intruder; for in but few cases is the land treated for, and the treaties complied with.

6. I have not seen defects in the land laws, except that conflict of railroad companies with the interest of settlers, in consequence of tardiness of surveys. It is my duty to call your attention to this subject, with the hope that it may lead to the saving of thousands of homes being made desolate. Here we have an example: The Central Pacific Railroad has been finished ten years, and the land along the route is not yet all surveyed. I have made $4,000 worth of improvements on unsurveyed lands. These improvements have been made from time to time as my business required it. I have no means of acquiring title to this land. Should I lay desert claim on it, part would fall on the Central Pacific Railroad land, and they do not offer their lands generally along the Humboldt for sale. Under this condition of affairs what would be the chances of my heirs in the event I were to drop off—die? Thousands of others along Humboldt are alike situated. Besides, I see here in Nevada no general public interest taken. Every man seems unsettled, public buildings neglected, taxes enormously high, and a general unsettled feeling among the inhabitants along the line of the forty-mile reserve. I firmly believe in granting lands for the construction of roads. They advance civilization, and are every way beneficial. This country is worthless

without the Central Pacific or some other road. But I must pronounce it impolitic and unstatesmanlike to make such grants without providing a method and means of survey at some time, so as to have the survey made in sections of country not longer than one year behind the completion of the road. If necessary, give more land and make the railroad companies survey it or defray the expenses thereof, and receive their land; then it would be taxable; and, to avoid the taxes, they would sell to actual settlers. This would be well for the country. Otherwise let their lands be forfeited.

7. The public lands of this State are not (I should estimate) more than one-fiftieth agricultural. In a few of the very highest mountains and on the north hill-sides very small bodies of timber are found that will answer to saw into common lumber and mining timber. These bodies of timber are already (probably) more than half consumed for mining purposes and to build mining towns. On many of the low mountains are scattering "nut pines," or "pinion pine," and a "juniper cedar." Neither of these two last-named timbers are fit for building or lumber, but are very useful for charcoal for smelting ores. And the "juniper cedar" answers a good purpose for fence posts for wire-fences, being generally about the proper size for one post. Probably one-third of these two kinds of timber are already used up, and possibly one-half, as in the vicinity of large mining camps and near the larger railroad towns nearly all is gone for a large radius surrounding.

As to the pastoral interests of this State it is secondary, the mining interest being first and the agricultural interest third.

8. I do not think it practicable to make a geographical division of lands in this State, Nevada, or Idaho, or Arizona, but will suggest a plan in answer to question 19.

9. As to land parceling, I think the present method good.

10. I would classify lands in States or Territories where irrigation is necessary to produce an agricultural crop.

First. Land that has water running through it or so near that the natural waters could be practically brought on to it to water the whole tract with, as first-class lands. Such lands I would dispose of under the old methods, and under the "desert land law," not higher than $1.25 per acre even within railroad limits, as all the good lands of the agricultural States have been sold at these prices; and it must be borne in mind that irrigation is a great expense, first for ditches, and secondly an annual expense of conducting the water properly over the crop-land. Besides, these lands are generally poor and require more manure, as the water washes it away, and the ground is porous and much of the richness filters through below.

Secondly. I would devote one section or more of lands as pastoral to each actual settler of such land, if cultivated, as would be compelled to hoist water with wind or other power to irrigate. I would make the term of residence to acquire a patent four years. I would further allow the settler to buy the same at 25 cents per acre after living on the same two years. Then I would allow any citizen of the United States to buy one section of such land at 25 cents per acre, provided he should first improve the said section of land to the value of $500, and then require the local land office to require ample proof to said improvements being equal to that amount before issuing certificate for patent. This last proposed law is more needed in this State than any commonwealth west of the Rocky Mountains, as the land is poorer, yields less grass per acre than any other, and will require considerable inducements to get settlers to buy and improve such lands.

AGRICULTURE.

1. The climate dry; rainfall light; season short; snowfall in deserts light, from 6 to 12 inches, the bunch-grass land often covered very deep.

2. The rainfall is principally in spring and fall; sometimes light rains in May and June. I cannot give you the number of inches, but surely less than any commonwealth west of the Rocky Mountains except Arizona. The general supply of water comes in the early crop season, and often in places does not last long enough to fully mature all crops.

3. No portion of the State can be successfully cultivated without irrigation.

4. Probably 1 acre to each 100 acres may be cultivated by irrigation of valley lands. More could be cultivated if water could be obtained. Upon second consideration I do not think there is running water to irrigate more than 1 acre to 500 acres, to average the State over.

5. Wheat, oats, barley, potatoes, turnips, beets, &c., and in the southern part of the State, in low altitudes, corn and vines and grapes, but generally in southern part of the State there is no water for irrigating lands.

6. A large quantity of water is required to irrigate land in this State, as the land is generally porous and the water sinks rapidly into the earth. There is no stratum of clay underlying the soil to keep the moisture up as there is in Illinois and Wisconsin. Added to this, the dryness of the atmosphere causes great waste by evaporation.

7. The source of supply of water is from small mountain streams and springs that soon sink in the desert valleys. Even the larger streams—Humboldt, Carson,

Rees, and Truckee Rivers—sink in this State. Fair crops are raised in the State to an altitude of 4,000 feet. A fine orchard is being grown at Humboldt House, Central Pacific Railroad; elevation, 4,262 feet. This rule applies to plain levels. In gulches, where the little valleys are more protected from frost, crops are grown at much higher altitude. Elko is 5,030 feet, and crops are grown higher on tributaries of Humboldt, but are confined to wheat, oats, barley, &c.

9. I am unable to state what portion of water is lost in ditches. I have before stated the waste is great from dryness and openness of soil and atmosphere dry. The laws generally of the Western States provide that parties living on the heads of streams and having first use of water shall turn the same into its natural channel, and various decisions have been made giving damages to second parties where water is wrongfully wasted by first parties to the injury of second parties. These laws are very important, affecting some of our heaviest mining interests, as well as agriculture.

Water has been taken up generally where it is anticipated that a mining town will be established; that is to say, where good-looking mining prospects are found, and also where the water is needed by parties for irrigation. Nevada State law provides that the locator of water may have the plat of his ditch or flume recorded in recorder's office of the county in which the proposed ditch or flume is to be constructed, then shall commence work on same within thirty days, and continue to work on same until completed. This act was approved March 3, 1866, and will be found in volume 4, page 415, Nevada statutes.

11. I have heard of several conflicts of water right, but only think of one now: Martin White Mining Company, and Mr. Wellington, in White Pine County. The company finally bought the land from Wellington and the water-right for $12,000. This Martin White Company's place of business is at Ward district, White Pine County.

12. I have heretofore estimated 1 acre in 100 to 1 acre in 500 to agriculture; the rest pasturage only.

13. It is, in my opinion, practicable to establish pasturage homestead, as I have before suggested under the head of disposing of the public lands of the Western States. Question 14 explained under same head.

15. It is impossible to make any reasonable estimate on the lands of this State, as some lands will support ten times as much stock as other lands in same county. I do not think this State will raise on a general average more than one-fifth as many cattle as Idaho Territory to the same number of square miles, and about one-tenth as many as Oregon or Washington to the same number of square miles. That is, leaving out of this estimate the great Cascade Range timber belt and sound country, *i. e.*, I mean to include only the grazing portion of Washington Territory which lies east of the Cascade Range of mountains.

16. About 200 head of cattle will be required at present rates of cattle in this country to support an average family. One hundred head, or less, if all stock round as usually grown—if the grown cows thereof were used for dairying connected with stock—would be amply sufficient. It is proper here to state that this State is poor for dairy business in the high altitudes, where bunch grass grows plentifully. The season for butter making is short; until first of June the cows eat wild onion, that gives milk and butter a characteristic taste; then the grass becomes too dry about middle of September—in dry season, sooner; so only three to four months can be calculated on, even from cows that bear calves, at suitable seasons. In the more desert parts can begin earlier, but must close earlier. On account of dry feed and scarcity of water, cows will soon have to go too far from water for feed.

17. Elko County now has all the stock it will possibly support, and for your benefit I have gotten the returns of Assessor Henry V. Mundell for 1879:

Number of horses assessed	18,676
Number of mules assessed	5,381
Number of asses assessed	15
Number of cows, calves, and young cattle assessed as stock cattle	60,000
Number of beef cattle assessed	36,432
Number of yoke oxen assessed	240
Number of sheep and lambs assessed	9,432
Number of hogs assessed	1,400
Total stock	131,576
Deduct for hogs	1,400
	130,176
Stockmen estimate seven sheep consume equal to one cattle; thus subtract for sixth-sevenths of the number of sheep	8,085
Cattle it would support	122,091

Elko County is about 160 miles square, or 25,600 square miles, showing that it supports only a fraction less than five head to the square mile. I think it is safe to esti-

mate that there is one-third more stock than the books show, or about seven head to each section of land. There is a vast amount of waste land in this (Elko) County, such as mountains and desert plains; yet I think it is the best county for stock in the State, and Humboldt County next, and southern counties the poorest.

18. Grass has diminished fast in all the country I have lived in, to wit, Oregon, Washington, Idaho, and this State; but as the grass gets short, growers turn their attention more to sheep.

19. I know of only one firm (Scott & Hauk, of Elko County) who fence. They keep their main band of stock on Snake River, in Idaho, and drive to their inclosures in Humboldt Valley the beef cattle, and hold them until the market suits to ship. In this inclosure they breed their fine horses and fine bulls. As a general rule cattle require their liberty in the winter in this State, as by instinct, when a storm is coming, they go to the cedar trees or in gulches, if they can, away from wind.

20. I think if stockmen could buy land so that they could afford to fence, much better stock would be raised. They could grow fine stock, and a general improvement in beef would be the result. As it is now, land is too dear for that purpose, including fencing; and to turn fine bulls or fine horses on to a range, all get the use of them alike; thus the owner loses part of his investment, and soon gets discouraged with trying to improve his stock.

21. Answered heretofore; mountain springs and spring lakes.

22. In grazing or feeding sheep and cattle, stockmen estimate one head of cattle equal to seven head of sheep.

23. Growth of grasses diminishes as fast, if not faster, pastured with sheep than it does with cattle.

24. Sheep and cattle graze readily and voluntarily on some lands until grazed too close. Then the scent of the sheep left on the vegetation or herbage will cause the cattle to change; but a rain or snow seems to renovate the range.

25. The prejudices cattle-growers have toward sheep-growers is founded in the fact that when a range is pastured closely down sheep can and will readily live on shorter feed than any other class of stock, and horses next; so when the range is partly eaten out the cattle-grower must move first if there is moving necessary.

26. I do not think it practicable to herd in this State generally more than 1,500 sheep in a herd, as they have to roam over too much ground to get feed; and while so scattered the cayotes, or parairie wolves, kill them before the herder can reach the opposite side of the herd.

27. Answered.

28. I have never known trouble to arise generally in ascertaining corners where I have lived.

TIMBER

I do not think the timber interest of this State worthy of your attention. But the same laws that govern other States would be applicable to this State, where there is actual sawing timber.

1. Answered heretofore in explaining the general characteristics of the country.

2. There is no timber planted in this country.

3. I would dispose of the public timber lands by homestead and pre-emption of 160 acres. For instance, as timber is about to be valuable, the sooner the poor man settles on it and protects it from waste until such time as he can sell it, the better. I have observed it in Oregon, Washington, and when traveling in the Sierra Nevada Mountains, in the vicinity of Truckee. I think the method as good to preserve the timber as any, and the poor man gets part of the benefit; can cut the timber and market it himself, and establish a business in accordance with his means and intellectual capacity. This policy makes competition in the timber business and prevents monopolies in timber business, thus protecting other business with fair rates that might otherwise suffer.

4. I think I would only allow timber to actual settlers, and at one price. My object in so doing is, as I before stated, to guard the consumer against monopolies and consequent high prices.

5. Forests fallen here do not grow up again.

6. In Oregon these fires generally were first set by Indians to chase the game, and made sad havoc. My remedy would be to kill the Indians and Indian agents and annihilate the Indian Bureau, the curse of all frontier countries, as well as the Indian himself. I will leave the subject of prevention to the people of the Middle States, who suffer most from these destructive fires.

7. Nothing to offer.

8. Our local custom here is to possess the timber with a kind of brush fence. Idaho had a possession timber law.

9. No answer to make; have not formed opinion.

LODE CLAIMS.

1. My main experience in lode mining was in South Mountain, Owyhee County, Idaho, as owner of argentiferous galena and carbonate ore mines.

2, 3. Not observed sufficiently to reply intelligently and satisfactorily.

4. I do not think the top or apex, the course and angle or direction of the dip of veins or ore-bodies can be determined in the early workings. I know it is wholly impossible as to contact veins. (See cuts of veins and ore-bodies, as found in different parts of the world, which you will find finely illustrated and their history explained in Von Cota's treatise on ore-deposits, written by Prim.) It is the standard history of mines of Europe. Every new mining district presents something new and peculiar to its locality.

5. I do know the rights of discoverers are not protected under the present laws; but ore-bodies are of so many shapes in different localities, and even in the same ledge or vein, that I cannot propose a law that would protect the discoverer without blighting the prospects of other prospectors.

9. The outcrops of lodes or ledge matter are sometimes wider than the lawful width, as, for instance, the "Original," located by T. M. Wessels and myself, in South Mountain, Owyhee County, Idaho, as it is different in form from anything I have heard of or seen described in Von Cota's treatise. I will give you a rough diagram here.

We located the ledge, supposed to be 100 feet wide of low grade ore, or ledge matter. It was tractable for two miles plain. We claim 3,000 feet in company, under old law, running eastwardly and westwardly from discovery stake and work. When, after years, we organized a company in San Francisco for work, Donally goes on to our ground and sinks a shaft, as marked, and finds a perfect vein running in nearly opposite directions, calls it by a new name and separate ledge, running different from our claim. The company preferred to stand the blackmail rather than litigate and buys him out. After further developments were made, we found all the true ore, valuable to work, was in these crop veins, each one running in same direction and passing through and outside of main strata of ledge matter same distance on both sides. All valuable ore-bodies in the camp were crossing this ledge belt in same way, although not generally understood, as we did not desire litigation.

I could illustrate true fissure veins, such as Comstock and War Eagle, and contact veins, such as Eureka and Ward, district South Mountain, Raymond and Ely, and Emma; but I have hurriedly consumed more time than I have space. I know as much about contact veins as I desire to know; if I knew less might recommend more. I do know that I could not propose a legislation that would prove equitable and satisfactory to me. I will, therefore, leave the subject to those who have more capacity, urging you to be cautious and examine the history of mines in Europe; ours in America are similar, no two localities exactly alike. For a period of fifteen years I have studied the nature of ore-bodies, that I might be able to work what I had intelligently, or invest in others prudentially, and have decided that relative to contact veins nothing can be judged except what is opened up and shown. Fissure veins are easier to form an opinion with regard to, and would be easier to regulate by law, for reasons of their peculiar shape, as you will readily see after looking over Von Cota's treatise on ore-deposits by Prim.

I will state that I think the present method of recording as good in practice as any I could suggest.

I would answer some more of your questions with regard to the method of locating and recording lode and placer claims, but I have already held this matter two months too long, and fear that in case you do find any facts contained herein that may be considered by you practical to adopt, the receipt thereof will be too late to be serviceable to you. The pressure of my business has caused me to put the matters off from day to day, and finally has been poorly done evenings when I ought to have been at rest.

Again thanking you for the honor conferred upon me, by soliciting my opinion, based on experience, and hoping you may have more satisfaction in conducting your labors on mines and mining than I could have, if the work rested with me,

I am, most respectfully, yours,

E. C. HARDY.

Suggestions of the Hon. C. N. Harris and others, at a meeting held in the governor's office, at Carson City, Nev., relative to the best system of controlling and disposing of the public domain, and recommending such changes in legislation as may be beneficial to the people of the State.

On the evening of the 31st day of October, 1879, a meeting was held in the governor's office, at Carson City, Nev., at which meeting there were present the following prominent citizens of the State among others, viz: His Excellency Gov. J. H. Kinkead,

Chief Justice W. H. Beatty, Deputy Surveyor-General I. N. Fassett, Secretary of State Joseph Babcock, Ex-Deputy Surveyor-General S. H. Day, ex-District Judge F. W. Cole, of Eureka, Hon. C. N. Harris, United States land register, at Carson City; S. C. Wright, receiver of United States land office; H. M. Yerrington, D. L. Bliss, Hon. James Crawford, Superintendent United States Mint, at Carson City; Hon. O. K. Stampley, N. Soderberg, esq., attorney at law, and George G. Lyons, esq., private secretary to His Excellency Gov. J. H. Kinkead.

Mr. Donaldson, member of the United States Land Commission, having stated the object of the meeting and requested of all the members present a free expression of opinion and of their views in regard to the policy of the Federal Government as to the best system of controlling and disposing of the public domain within the State, and such changes in the legislation of Congress as might be beneficial to the people of Nevada—

The Hon. C. N. HARRIS made substantially the following statement:

I think there are at present too many papers and too many forms used in the land office, and I think the proceedings in obtaining titles to land from the government could be greatly simplified. It is also my opinion that all fees ought to be abolished, and that the officers of the land office ought to receive fixed salaries.

The ruling of the department to the effect that when an applicant files his declaratory statement to purchase lands, no matter whether he consummates it or not, he thereby exhausts his right to purchase and to acquire homestead, I think is wrong.

There is another rule which I think ought to be changed. In the case of the selection or abandonment of homesteads we take the proofs in the matter, send up the papers to the department, and perhaps, in the course of a year, the department sends them back. I think in the first instance, as we take the proofs, instead of recommending a decision one way or the other, we ought to be permitted ourselves to enter up a judgment in favor of the party entitled to the land. I think the register ought to have a seal. He ought to have the right to subpœna witnesses and perpetuate testimony. All mining recorders ought to be abolished, and the business ought to be put into the hands of the officers of the United States Land Office with power to appoint deputies.

At present in a mining district half a dozen persons, who may not be miners, may organize a district, and make by-laws, limiting the amount of ground which shall constitute a mining claim. They may elect somebody recorder, and the only entry or evidence we have of the claim of the miner is a copy of his record of the notice. Suppose the paper is burnt up or the recorder absconds. In such case no patent can issue. Now, if the claims are filed in the local land office, and are reported at the end of the month to the Commissioner of the General Land Office, there is a complete and permanent record. If the records of the land office are burnt up, the Commissioner has them, and *vice versa;* if the officer of the land office attempts to alter them, it is impossible to perpetrate the fraud, because it is sure to be detected, and the officer of the local land office would be prevented from attempting any alteration for the same reasons.

Here Judge COLE remarked that it would be impracticable to abolish the mining recorders, on account of the great distance, often many hundred miles, between the land office and the mining district. He said it was true that the county recorders might be appointed deputies, but that would not help the matter materially. Mining districts are generally organized very suddenly. People sometimes flock in there in great numbers in a very short time, and there have been camps in this State and elsewhere where the best locations have been made in two or three days. It is the rule in most districts that a mining recorder goes on the ground when he records the claim. I see no reason why the government should exact that the miner must go to the land office or its deputies when he locates a mining claim. The government never exacts that a man shall come to the land office when he makes a location to pre-empt agricultural land.

Mr. CRAWFORD. It seems to me that there is an easy way to obviate any difficulty in this matter. Some time ago I went down into Churchill County and located a mining claim there. I recorded it with the district recorder (that is the mining recorder there), and then I came by the county-seat, and recorded it there. A man could make a record that way.

Judge COLE. There is no law authorizing such recording.

Judge HARRIS (continuing). I think, also, that all these contests about mining titles could be tried by the district land officer. The whole matter of referring any questions of this sort to the local courts merely involves the whole proceeding in interminable trouble, voluminous, and expensive litigation, and without results that are at all satisfactory to the administrators of the Federal law. It is simply an absolute decision of the local tribunals without the intelligent adjustment by the Federal authorities of the rights of the claimants. I am speaking now principally of the questions in regard to priority of location, which is the most serious source of litigation.

Question by the COMMISSIONER. Have you heard the proposition of square locations discussed?

Judge HARRIS. I have talked it some myself, and conversed with a few gentlemen upon the subject. My opinion is that eventually it will be necessary to change the whole system of mining locations to that of square locations, no matter whether the ledges are perpendicular or horizontal.

Mr. WRIGHT. I think that system would work very badly in this State.

Judge COLE. It would not work in Eureka district at all. They had square locations there. The mining laws of that district at one time provided for such locations, but the system was soon abandoned as impracticable.

Judge HARRIS. I think the present system of patenting ledges merely postpones to a degree the precise trouble that exists and always has existed in mining properties, frauds and the like in the absence of patents.

Question. In getting patents from the General Land Office, how long does it take you?

Answer. There is nothing that will enable me to state that even approximately. It may take months and it may take years.

Mr. WRIGHT. That depends upon how much you can afford to send to Washington to some gentlemen there to get them to take up the case speedily. In that way one man can get his patent in a few weeks, while another man must wait for years. I think there ought to be no preference.

Judge HARRIS. I have heard the idea of a pastoral homestead advanced. As I understand it, it is based upon this theory: 160 acres in the Eastern States will sustain a family. It will require about 30 acres of this arid land to feed a beef, and 100 head of cattle will keep a family, and that, therefore, a man should be entitled to take 3,000 acres of such land for a pastoral homestead. That idea strikes me decidedly favorably. In fact, we must in this country, under a peculiar condition, absolutely depart from all known regulations prevailing in the Eastern States, in order to adjust ourselves to what we have. Of course no man should be entitled to such a homestead except upon arid lands.

Another proposition: The wealth of our State, outside of mining, is cattle. We are going to be largely a stock-raising people. I would not be in favor of any law that would drive off these great herds of cattle that are now being pastured in different portions of the State. I do not think that that industry should not be fostered because such property is generally or sometimes held by monopolies. I am not favorably impressed with the idea of leasing lands for such purposes generally, but it may be that in the course of proper legislation for the purpose of distribution of the domain that a system of leasing might be practicable. My theory is that the disposal of the public domain finally should be arrived at as speedily as practicable. I would sell all the land cheap and in unlimited quantities, and I would protect the actual settler. I would sell the timber land and on easy terms, and as required by the business interests of the State. I am hardly able to say whether I would limit the purchaser to any fixed quantity. I would grade the price of the land; the minimum price should be about $1.25 an acre, but I think that land valuable exclusively for timber on an average ought to bring about $2.50 per acre.

I believe that private ownership is better protection than public ownership as a rule, and for that reason favor an early disposal of the public domain. If, however, no change is made by Congress in the laws governing the disposition of the public timber lands in any other respect, I think they ought to be put under the jurisdiction of the district land offices of the United States. (Of course I do mean that the Land Office should have jurisdiction over prosecutions for the infraction of timber-land laws.) There is always a serious objection with the American people to the interference by outside officers, such as these timber agents, who now practice a system of espionage upon the people. It is anti-American. It is not a desirable officer to place anywhere; but, if you are to require the land officers to perform judicial functions, I think the matter should be placed in their hands entirely.

Again, if the government does not sell or pass a law to sell the timber lands, I think it would be wise to authorize the district office to issue permits to cut timber upon the public land, under proper regulations, so as to protect the forests. At present the ravages of fire and destruction of timber seems to be less extensive than in former years. I have never studied up that matter so as to enable me to say why this is so.

Mr. BLISS. I think the reason of that is that all the good timber land has been bought up, or taken up, and is held by private ownership. Up at Lake Tahoe, whenever we discover fire, no matter on whose lands, we go and put it out, or send help to put it out, right at the start, and so do other adjoining owners, because it is to our interest to prevent the spreading of such fires and save other adjoining timber.

Mr. DONALDSON (to Mr. Harris). What about the surveys of the public lands? Can you make any suggestions about it? Are you in favor of the rectangular system or not?

Answer. I am, with this modification: That a large portion of what you call arid land should be surveyed in tracts, and not subdivided. We have a great many complaints about the lack of permanent monuments on the surveyed lands. People have

to employ surveyors to go and hunt them at a great expense. There ought to be a system of permanent monuments. As to the surveys, I think they should be made more upon the suggestions coming from the wants of settlers than from any system. There should be a paid corps of men to do the surveying, and the contract system ought to be abolished.

Upon the subject of irrigation, nearly all the water that we have in the State is in the main used at present, but I think more could be irrigated by building reservoirs in the mountains and with improvements in science of irrigation. I should undoubtedly favor a national or State system of irrigation. I think the national government should give to a man as reward all the land that he irrigates. I think some improvements could be made in the township plats, furnished by the surveyor to the land office. Such plats ought to contain an accurate topographical description of the land. The deputy surveyor could take a barometer with him when he goes to survey the land to enable him to give necessary information about the climate. If he was a paid surveyor and took more pains than at present he could tell you the altitude of the mountains and the plains and define that on the map. That would at once classify the lands. We are called upon interminably to give information to people at a distance as to the character of the domain where there are vacant lands, &c.; and we are wholly unable to give any reliable information. We see simply upon the maps squares of lands. We are unable to tell from any topographical description what is the character of the land, and whether available for settlement, and it is peculiarly necessary in order that the land office may serve its proper papers that we should have these topographical features.

Mr. BLISS. They lay down streams on the map and some of them will only have water in them two or three months of the year.

Judge HARRIS. On these maps there are to some extent statements as to what is meadow land and mountains and the like.

The present system of disposing of the public lands I regard as wholly insufficient. I am unable to say whether the State has realized anything out of the sales of lien lands which have been sold here, on some of which the purchasers have paid 20 per cent. and afterwards abandoned them. It has been suggested that the general government should give to the State in lieu of the sixteenth and thirty-sixth sections a smaller amount of land, to be selected by the State giving the State scrip for such lien lands.

Governor KINKEAD. The last legislature petitioned Congress to give to the State two millions of acres instead of the grant of the sixteenth and thirty-sixth sections, which amounts to upward of four millions of acres, allowing the State to select such lien lands.

Mr. HARRIS. If I remember our records correctly, scarcely any of those lien-land selections have been as yet confirmed to the State of Nevada. I am unable to say what the reason of that is.

Another thing: The land officers ought to receive official notice of the issuance of patents. In the records of the Land Office there is a column headed date of patent, but we seldom receive official information of the issuance of the patent. I have one instance of that. It is said that the Scorpion patent was issued some time ago, but we knew nothing about that officially.

Mr. YERRINGTON. Have you received notice of the issuance of the Fairfax or Vermont patent? They have received one recently.

Answer. I have never received any notice of any.

Question (by Mr. DONALDSON). What other suggestions can you make in regard to the public lands. Give us any ideas of your own on the subject.

Answer. I don't consider Nevada an agricultural State. It is mineral and grazing; agriculture is incident. I think the government ought to take measures looking mainly to an early and final disposal of the whole domain, and I think it ought to all be surveyed except running the subdivisional lines of the township. I think all these questions about the pasturing of cattle and the use of water ought to be settled under the existing law of Congress; the first appropriator has a right to take the water for beneficial purposes. There ought to be a law requiring the purchaser of land to pay for the same within a certain time or abandon it. I would make the limitation about one year. I think the Land Office should have jurisdiction to prescribe the terms and conditions under which one partner in a mining claim may sell out the rights of his coowners, and the notice to be given in such cases. No other suggestions appear to me at present.

Testimony of J. C. Cooney, Fort Bayard, N. Mex., relative to lode claims.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

FORT BAYARD, N. MEX.,
December 15, 1879.

Public Land Commission, Washington, D. C.:

LODE CLAIMS.

1. Miner and prospector for nine years.

2. No two men construe the United States mining laws alike. Sections 3 and 14 conflict, which is one of the greatest causes of litigation.

3. The filing of surveys of lode claims which overlap on the surface should be discontinued.

4. The top or apex of a vein or lode is the width of the vein or lode on the surface; but the United States mining laws means the top or apex to be the width of the claim, 600 by 1,500 feet. (Section 3.) The dip of a lode cannot be determined in the early workings of the lode. A vein dips more the first 200 feet from the surface than after. A vein will dip more when carrying metal than when it is barren.

5. No; the rights of the discoverer are not properly protected under present laws. Subsequent locators beat the discoverer in all cases. We owe all the discoveries of mines and new mining camps to poor men, and the men of means beat them out of their rights.

6. Litigation does not grow out of not being able to determine the dip of a vein; it grows out of sections 3 and 14. Section 3 gives all the surface and all below the surface; section 14 allows the subsequent locator to follow the vein under the surface of the prior locator's claim until he strikes the vein of the prior locator's claim, &c.

7. Yes, often; and the contest settled with rifles.

8. Yes, if he had not a good rifle.

9. I don't think there are five claims in the United States wider than the legal width, and they can't be called veins or lodes; it is a multiplicity of spurs or seams.

10. Yes. Crossing a deep gulch or cañon they will run at right angles on each side of the cañon. A vein of over a foot will not run outside of the side lines in 1,500 feet.

11. It works to the disadvantage of a poor man under present law.

12. If A is a poor man and B is wealthy; A has no means of going to law, and B gets his claim.

13. Yes; not only from the dip, but from cross-lodes and spurs or seams running out of the mother lode. Subsequent locators locate those cross-lodes or seams across the prior locator's claim, in accordance with section 14, and they work the prior locator's ore if the prior locator is not rich enough to sink down or drift to prove that they are on his lode.

14. If a locator has 300 feet on each side of his vein, he should not be allowed to follow the dip. There is not one vein in a hundred that will dip so much as to pass outside of perpendicular lines drawn down from the side lines in less than 3,000 feet, and it has been proven that veins do not pay for working below that depth. Limestone deposits are different, and the metal lies in all shapes and forms.

15. Yes, it was done in the district formed by miners and mine-owners only. A president and secretary were appointed and one blank book furnished, the boundary lines of the district established, and the amount of work required or depth of a shaft or length of a drift to be drove to constitute one hundred dollars' worth of work. Cutting down claims and district recording is becoming obsolete. We record in the county in which our claims are situated.

16. The effect of a record in the county is good as far as I know. The mode of taking up claims are all about the same. The vein is described by prominent objects and adjacent lodes that are well known; the papers are made out on the ground and signed by the locator and witnesses, and a copy of the same sent to the county clerk for record.

17. Yes, if changed to the land office.

18. Yes; I have known district records to have been destroyed. The security is to have no district records; to have it in the county or United States land office.

19. The initiation of record title should be placed exclusively with the United States land officers.

20. Yes; I think it would be more satisfactory.

21. SEC. 3. That the locators of all mining locations heretofore made, with 300 feet on each side of the vein or lode, or which shall hereafter be made on any mineral vein lode or ledge situated on the public domain, their heirs and assigns, where no adverse claim exists at the passage of this act, so long as they comply with the laws of the

United States, State or Territorial, not in conflict with said laws of the United States, shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward perpendicularly; and provided further, that nothing in this section shall authorize the locator or locators, possessor or possessors of a vein or lode which extends in its downward course beyond the perpendicular lines of his or their claim to enter upon the surface or under the surface of a claim owned by another or others.

22. I think five years is long enough. No locator or locators should be allowed to locate more than four claims of mineral land on the public domain. I have known men to locate from 20 to 100 claims in one district, thereby keeping men out of claims that would work them. Claims should not be cut down below 1,500 feet long, with 300 feet on each side, side lines parallel with the general course of the vein.

I remain, very respectfully, your obedient servant,

J. C. COONEY,
Fort Bayard, N. Mex.

Testimony of N. J. Hall, Colfax, N. Mex., on agriculture and timber lands.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. Cattle raising.
2. Have lived in the county of Colfax, Territory of New Mexico, eleven years.
3. Have taken steps to acquire title to the public lands of the United States by homestead and pre-emption.
4. None.
5. My personal experience has been, I have not received a title yet, after the expiration of over a year since the receipt of duplicate. Expenses of procuring pre-emption title, $72. I know of parties who have received duplicates over two years ago, and have not received patents yet. I do not know of any contested cases.
6. Yes. In the great distance we are removed from the land office, making it difficult and expensive to reach it, and rendering it almost impossible to get there to make final proof in case of sickness or lack of means. Remedy, allowing final proof to be made before a justice of the peace or notary or other officer qualified for the purpose.
7. Public land in Colfax County is pastoral altogether in the eastern part of the county, with but little timber, with some agricultural and mineral land in the western part. Western part mountainous; eastern, plain cut with some cañons.
8. By general rule, in agricultural land, of water sufficient for irrigation.
9. Think that the surveys had better follow the cañons and streams, as the land outside is utterly worthless for farming and hardly worth paying taxes on at 10 cents per acre.
10. Allowing the homestead and pre-emption laws to remain as they are, and selling the pastoral lands adjoining homesteads and pre-emptions to actual settlers at a low figure.

AGRICULTURE.

1. Climate, dry; temperature moderate; rainfall very light; length of seasons for farming not to exceed five months; snow-fall in the winter very light on the plains, heavier in the mountains. Supply of water for irrigation very limited, all being supplied from small springs; think not enough east of the Maxwell land grant to irrigate 2,000 acres.
2. Generally June and July, and this in showers, as we hardly ever have a general rain. The supply does not come when most needed for irrigation.
3. None.
4. One acre in one thousand.
5. Wheat, oats, corn, and vegetables.
6. Cannot say, as I have never made any trial.
7. Spring entirely.
8. Think the irrigation injures the soil to the extent of destroying its fertility in the end—the irrigation from springs. None so high but crops can be raised on it, if tillable land, and some crops succeed better at a high altitude.
9. There is no water returned to the streams in this section.
10. All the water has been taken up under the homestead and pre-emption laws, where surveyed.
11. None.
12. All except what can be irrigated.
13. No; without there is living water, and then under the present homestead law, with the privilege of buying more around it at a low figure.

14. Yes; if it could be put at a price not to exceed 15 cents per acre. No; but give every settler the first chance to buy the land adjoining him.
15. Full fifty acres; fully up to the average.
16. Three hundred head.
17. About seven or eight.
18. Yes.
19. Yes; in part. They can, if not overstocked.
20. Yes.
21. Springs and standing water.
22. Two, as they tramp out more than they eat.
23. It has diminished, and in many places entirely disappeared.
24. The cattle will leave without they are compelled to stay; if compelled to stay, will die.
25. There is a party feeling between them, but no conflict; but there is a liability for one at any time.
26. Cannot say; sheep from two to four thousand; cattle run loose.
28. No, as it has just been surveyed.

TIMBER.

There is but very little in the east end of the county.
Think there ought to be some rigid law in regard to setting on fire timber or prairie land.
No mineral lands in this part of the county.

N. J. HALL.

Testimony of William Lee Thompson, merchant and farmer, Upper Membris, Grant County, N. Mex., relative to agriculture and timber lands.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. William Lee Thompson, merchant and farmer, Upper Membris, Grant County, New Mexico.
2. Some thirty years.
3. The land I now live on, under the homestead act.
5. Cost for advertising, $10; traveling expenses, 100 miles, $50; 160 acres homestead in full, fees, $42; total, $102.
6. The enormous amount of writing and advertising should be done away.
7. Very little agricultural, mostly mineral and pastoral lands.
10. I would suggest that the small valleys in these Territories be immediately surveyed, so that actual settlers can obtain title. I believe no other lands should be surveyed. I notice most of surveys made in this Territory have been made on barren plains of no earthly use for any purpose (very easy to survey).

AGRICULTURE.

1. Climate fine, very little rain or snow; frost comes October 18 to 25; we farm it all winter.
2. December, January, and July.
3. None.
4. About not one acre in 5,000,000.
5. Corn, wheat, barley, and oats, and garden vegetables.
7. Some small creeks and the Big Grande, which is dry now for some 300 miles.
8. Irrigation enriches the land, leaves a sediment. About 6,000 feet.
9. Three-fourths taken up, balance goes to the streams.
11. No legal conflicts have as yet arisen.
12. No lands have been entered for pasturage, as no law would give enough.
13. Six hundred and forty acres is a very small farm for a pasture for a very small family.
14. Not limited.
15. Five acres, about, for this Territory.
16. One hundred and twenty head.
17. One.
18. About the same.
19. No fences; no fences here.
20. They would not.
21. From springs and creeks (very scarce).
22. Seven.

23. Grass does best with cattle.
24. They do here, but to advantage.
25. No conflicts as yet.
26. One hundred to five hundred cattle; 100 to 2,000 sheep.
28. Seldom a survey can be traced here; surveying is very poorly done.

TIMBER.

1. No timber within 12 miles.
2. Cottonwood and willow chiefly for fences; 20 miles up the stream some scrub pine grows, which are used for houses.
3. All timber lands are needed for the settlers.
4. No real timber lands in this section.
7. I am in no way interested in timber cutting, but believe any one who will manufacture lumber in this county is a benefactor.
8. They cut for real needs of settlers.
9. Any suit commenced against any one for cutting timber would be a public damage.

Testimony of George Gray, of New York, N. Y., relative to the public lands and surveys.

Before the Public Land Commission, Washington, December 11, 1879.

ABSTRACT OF POINTS PRESENTED ORALLY BY GEORGE GRAY, COUNSELOR AT LAW.

1. The present system of surveying the public lands has been in operation three-quarters of a century. It is "the American system." It has the confidence and appreciation of the people. It is simple, certain, and precise. It avoids that most harassing and fruitful source of litigation arising under all other systems—namely, conflict of boundaries. It is the best system that can be devised to meet the wants of an agricultural people, which the Americans pre-eminently are and are to be.

2. The region west of the one hundredth meridian, or the Missouri River, and north of the forty-fifth parallel is agricultural, mineral, or timber land. These agricultural lands do not anywhere require irrigation or special treatment to render them productive. The mining laws require amendment to give precision to claims and certainty to titles. This can, to a great extent, be accomplished by confining rights below the surface to perpendiculars from the superficial boundaries. The present system of surveys is well adapted to the timber lands. The land-laws should be so amended as more effectually to protect the timber lands from spoliation under cover of homestead and pre-emption entries. This, with persistency in the efforts now made by the Interior Department for the preservation of the timber on the public lands, is all that is required. Sales of timber or of lands chiefly valuable for timber, may be as advantageously made, for the purchaser and the government, under the present system of subdivision as any other; but such sales should be to the highest bidders or at an approved valuation. All agricultural lands should be open for sale by private entry, in quantities not exceeding one section, and until so entered they should remain subject to occupation and settlement under the homestead and pre-emption laws.

3. Through the region above outlined the Northern Pacific Railroad is being constructed. From the Missouri River, in Dakota, to the Yellowstone, in Montana—about 220 miles—the road will be completed and in operation in 1880, and within the same time about the same length of road—from the Columbia River, in Washington Territory, to Lake Pend d'Oreille, in Idaho—will also be completed and in operation. As an evidence of the perfect adaptation of the present system of surveys to the wants of the people, and of their confidence in its certainty and security, it may here be stated that, in anticipation of this early completion of those two divisions of the railroad, many hundreds, or rather thousands, have already settled on the agricultural lands within the limits of the grant. Where the lands are surveyed the government reserved sections are occupied to as great an extent as are the alternate odd sections. Where the lands are as yet unsurveyed the settlers are opening farms with equal feeling of security, since the railroad company offers all agricultural lands in the odd sections west of the Missouri River at the uniform price of $2.50, cash, per acre to actual settlers; so they are fully protected whether afterward they are found to be on odd or even numbered sections. The present system of surveys is well understood, and it fulfills every requirement.

4. The Gulf States containing public lands are, like the region north of the forty-fifth parallel, adapted for agriculture, and both regions are alike capable of sustaining large populations.

5. The intermediate belt embraces vast extents of fertile lands, bountifully supplied

with all natural sources and means of productiveness; but in certain other portions of this central region, while the population, if any, continues sparse, surveys will not be required for some time. Persons engaged there in cattle raising have the free use of the public lands for grazing purposes, and the government is not thereby a loser; and every one employed in the business having the necessary qualifications can have, under existing laws, 160 acres of land for cultivation, the title to which he can obtain when the surveys are made.

6. So long as there remain, as there are, large areas of the public lands naturally suitable for cultivation—not requiring irrigation or other artificial expedients to render them productive and involving the expenditure and investment of large capital—the question of how to survey or dispose of the "arid desert" is not now a practical one. But even as to the desert lands, the present system of surveys by fixing standard parallels, base and meridian lines, will give established points of departure for subdivisional surveys when required. The extension of the system to this extent over the plains will be necessary in due time for the continuity and completion of the geographical survey of the country.

7. The present system of surveying the public lands was adopted after the Louisiana purchase, and was not designed for the Atlantic States merely. It was founded in wisdom and forethought, perfected in over seventy years of practical operation, and has grown into the very life of the people. It has aided in giving happy and prosperous homes and honorable means of livelihood to millions, as it will to the hundred millions of citizens who are to occupy the western portion of the United States. There seems to be no sufficient reason for revolutionizing the system which has given and is capable of giving such results.

GEORGE GRAY.

Testimony of J. W. Belknap, farmer, Lake County, Oregon, on agriculture and timber.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

Gentlemen of the Public Land Commission:

I have before me questions directed to me with request to answer the same, which I will so as far as I am able.

1. J. W. Belknap, Summer Lake, Lake County, Oregon. Am engaged in stock-raising and farming.

2. I have lived in Lake County five years; in the State of Oregon thirty-one years.

3. I tried to acquire title to land under the pre-emption laws, but failed on account of not being able to make the payment as required by law.

6. I have observed defects in the public-land laws.

7. The public lands in this country are mostly mountains, fit only for pasture and timber. Perhaps one-hundredth part of the land is fit for agricultural purposes.

10. I think actual settlers in the mountain regions, where the land is principally pastoral, should be allowed more land than is allowed by existing laws.

AGRICULTURE.

1. The climate cold in winter and changeable in summer. Supply of water for irrigation moderate.

2. The rainfall occurs between the first of November and the first of May in the winter. There is but little rain when most needed for irrigation.

3. About one-half of the land cultivated requires irrigation.

5. Wheat, barley, and oats are the principal crops.

6. About 200 inches of water will irrigate one hundred acres of wheat.

7. The water that could be applied to irrigation is mostly small creeks or spring branches coming down from the mountains.

9. In my section, water has not been taken up to any extent. Settlers claim the water that runs through their land; will not allow it taken out unless returned to the channel before entering their land; do not know under what law it is claimed.

12. About three-fourths.

13. It is; each settler should have not less than 320 acres.

14. If these lands were put in the market, the quantity to each purchaser should be limited.

15. From 3 to 4 acres.

18. The growth of grass has diminished. Think there is about 150 head to the square mile.

19. Cattle owners do not fence their range; think they could be confined with safety.

20. Yes.

22. Ten head of sheep are equal to one beef; diminished the same as land pastured with cattle.
24. No, not to any extent.
28. There is some trouble in finding corners; they are not properly marked.

TIMBER.

1. There is abundance of timber, mostly yellow pine; very poor for general purposes.
3. By sale; do not think it should be higher than agricultural land.
5. There is a second growth of same character.
7. There has been no unnecessary waste of timber to my knowledge in this section.

J. W. BELKNAP.

Testimony of S. Coffin, register, and Caleb N. Thornburg, receiver, United States land office, Dalles, Oreg., relative to agriculture and timber, lode and placer claims.

AGRICULTURE.

1. Mild and healthy. Rainfall principally in fall, winter, and spring. Snow in January and March. Irrigation not generally needed.
3. A greater portion.
5. Very little irrigation needed.
6. Don't irrigate wheat.
8. Crops are raised at a high altitude.
12. Over one-half.
13. Yes; six hundred and forty acres.
14. No.
16. About one hundred and fifty head.
18. Diminished.
19. No.
21. Various streams.
23. Diminished.
24. No.
25. Many disputes, but nothing serious.
27. All road companies who have lien lands should be compelled to select them and let the balance now withdrawn be opened to settlers. If any grants to railroads, such as to North Pacific, are extended, the lands should be sold to actual settlers at $1.25 per acre in entire quarter sections only, and the money placed to the credit of such companies.
28. Yes.

TIMBER.

1. Principally pine, fur, and oak. Cannot well estimate the proportion of timber land; but say one-twentieth.
2. Locust and poplar. Think pine, fir, and oak would do well.
3. Sell under the present law.
5. Young timber starts immediately and grows thriftily.
6. Generally started by carelessness of Indians.
7. Timber depredations in this district not extensive; principally by settlers for necessary fuel and for fence and building purposes.
9. Place the guardianship of timber lands in custody of United States district land offices, with power to arrest, &c.

LODE CLAIMS AND PLACER CLAIMS.

There are but few mining claims in this district. We have not had any experience in mining-claim entries.

Respectfully submitted.

S. COFFIN,
Register.
CALEB N. THORNBURG,
Receiver.

Testimony of George B. Currey, lawyer, Canyon City, Grant County, Oregon, on agricultural, pasturage, and timber lands, mining laws and claims.

CANYON CITY, GRANT COUNTY, OREGON,
January 15, 1880.

Public Land Commission, Washington, D. C.:

SIR: A circular containing numerous interrogatories concerning the operations of the United States land laws by some means has found its way to my table.

In response to first series of questions, by number, I answer as follows:

1. My name is George B. Currey; by occupation, lawyer.

2. Have lived in Oregon 26 years.

3. As attorney I have had something to do in procuring titles for clients of nearly every grade of land—agricultural, saline, mineral, homestead pre-emption, and desert.

In answer to question 6, I say: 1. The rights of administrators or executors is not clear as to homestead claims where no heirs enter and take possession of the claim, leaving it questionable if administrators can perfect title. 2. In most new countries, where land districts are large, it works a hardship to compel pre-emptors to appear in person to make final proof. There ought to be some means inaugurated whereby the distance between the Department of the Interior and the Department of Justice could be abridged. The effect of the present encasement of each department in its own peculiar shell renders perjury in making entries and final proofs under homestead, pre-emption, desert, and timber-culture laws a thing of easy and safe accomplishment. Rich men constantly are in the habit of procuring the service of their hired men to take up claims, perfect title to parts of the public domain, and then transfer to their employer. A law prohibiting the transfer or lease of a pre-emption claim for, say, five years after receipt of patent at the local land office might have the effect to stop the present practice.

7. This is a mountainous country. It has a considerable amount of mineral, gold, and silver lands; about one-tenth of the surface plowable, the remainder high lands, cut up with steep cañons and rocky ridges, good for grazing purposes. There is a timber belt following the trend of the Blue Mountains, about fifty miles wide and hanging on either side of the summit ridge.

No geographical division would classify the lands of this country. The classification must be made, if made at all, from the qualities of the land as found upon observation made with intelligent and honest eyes.

The present system of surveying will produce a more satisfactory means of designating lands than any other. Township the whole county, sectionize the timber lands on the lower rim and adjacent settled valleys, and as applications are made to purchase subdivide. The high lands had better be held for some years subject to the homestead and pre-emption laws.

Any scheme to lease or otherwise dispose of the grazing lands will retard the settlement of the country and keep out actual homestead and pre-emption settlers, while those who obtain possession of the grass lands will stock the same to their uttermost capacity, and in a few years, after having rendered it worthless, throw up their lease and abandon the country, denuded of grass and timber, a sterile waste, where no man can make a living until years of recuperation have intervened.

If held subject to homestead and pre-emption, lands which are now held in the estimation of the local population worthless, as immigrants crowd in will be found not only desirable, but valuable.

There is, in my opinion, no better way, both for government and people, than the homestead laws, with some better guards against loose swearing.

This is a dry climate. The annual waterfall, including snow and rain, does not exceed 12 inches annually. The air is very arid. The greater part of the rain falls in early winter and spring, with intervening snow. The supply of irrigating water is from the melting snow in the high mountains.

It is now thought that no part of this county will produce any crops without irrigation. This, I think, is a mistake, as I am satisfied that good crops of fall-sown wheat and rye can be raised on the uplands having a hard-pan or clay substratum.

There is but a very small proportion of this county that can be irrigated on account of its altitude above the beds of the creeks. Wheat, oats, barley, corn, and garden vegetables of most kinds are grown here with satisfactory yields by aid of irrigation. My experience is that unless the subsoil is clay, irrigation soon drains or leaches by percolation the fertility out of the soil. It will take about 100 inches of water, miners' measurement, to irrigate 100 acres of wheat; if the soil is loose and based on gravel it will take much more.

Very little water returns from the irrigating ditches to the original streams; it is absorbed by the soil or lost by evaporation. There is no statute of the State of Oregon changing the common law as to the appropriation of water. A sort of a local custom prevails here similar to the practice under the statutes of California.

My judgment is that it is best not to put the lands on the market at private cash entry. The ingenuity of the law-makers can devise no effectual method of limiting the amount one man can procure with cash.

The area of this county is so large and settlers so sparse that I have no means of forming an estimate of the space required to keep a single animal, but guess that a cow will eat all that grows upon ten acres in the course of a year.

In the vicinity of settlements and stock ranches grass has diminished amazingly in the past five years.

Cattle-raisers here do not fence in their range.

Sheep and cattle will not graze on the same ground. The stench from sheep is repugnant to the cattle, and they will not remain on the ground over which sheep have passed.

Sheep and cattle men have thus far in this county got along without doing much more than to curse each other and make some threats. Killing will commence next spring. As far as finding the marks, mounds, stakes, and stones of the United States deputy surveyor who surveyed this county, the thing cannot be done. This country was surveyed on paper, with just enough field work done to keep jobs from overlapping. No settler ever pretends to know where a corner is or ever was. Private surveyors who keep certain starting corners up are relied upon to find out where the United States deputy surveyors ought to have put the corners.

The forest timber of our timber belt is pine, fir, tamarack. Along some of the creek cottonwood, alder, and birch may be found.

The mining laws for the disposition of placer and quartz lodes are rather complex, but seem to give satisfaction.

I would suggest that there might be some limit to the number of claims one man can take up under the United States mining laws.

Very respectfully,

GEO. B. CURREY.

Testimony of Lyman L. Hawley, stock-raiser, Silver Lake, Lake County, Oregon, relative to swamp land, pre-emption and homestead claimants, homestead law, pre-emption law, lands, grazing lands, and agriculture.

To the Public Land Commission :

1. Lyman L. Hawley; am a stock-raiser; have lived in the State twenty-six years, in the county seven.

3. I have applied for State title to 200 acres of swamp land. I don't feel sure that I will ever get it, as I don't believe the State has located it according to United States land laws.

5. The expense on uncontested land is just what the law prescribes as fees and values. On contests with the State in swamp-land cases, United States pre-emption or homestead claimants, the expenses have been heavy and decisions delayed, and the whole of the business very detrimental to the actual settler. Other contests are settled promptly with little expense to parties.

6. I would say that the homestead law should be so amended that the settler could acquire title to as many locations as he lived full required time on, and abolish the pre-emption law. There is a class of people who keep on the frontiers all their lives, and should be provided with a home as often as they choose to move; they are the only people fit to make the first improvements and fit the country for a more dense population.

7. I will confine my remarks to this county, which is made up of lake basins with low mountains covered with a poor quality of pine timber; there is some swamp land on nearly all streams that empty into the lakes, and two or three large marshes could be drained. There is a small portion of agricultural, a much larger pastoral, and still larger part is timber and worthless desert. The timber will never have other than local value.

8. The character of lands can only be ascertained by the surveyors.

10. Land in this section being principally grazing should be leased in lots of from one to ten thousand acres for twenty years at a time for a small sum; at the expiration of such lease, if not applied for by settlers, re-lease it to the same parties.

AGRICULTURE.

The climate is cold and frosty; rainfall is light; snowfall in winter is sufficient to supply water for irrigation. The snowfall is from November to March.

3. A very small proportion.

4. There are some large tracts of sage-brush land that may be cultivated by irrigation.

5. Small grain and hardy vegetables.
7. The supply of water is abundant.
10. There is little State law on water rights; all water must be used or returned to its natural channel.
13. If homesteads are made on pasture land in this section they should contain at least 5,000 acres.
14. If lands are placed in market the sale should not be limited, as speculators will find means to purchase what they want.
15. It will take ten acres of irrigated or farming land or 50 acres of pasture land to make sufficient grass for a beef.
16. A family could be supported with 100 head of cattle if we could get title to lands and improve the same; as it is, the best is very risky.
17. About sixteen.
18. Diminished. We have had too much stock.
19. Good pastures for winter would be a great help to the stock-raiser.
20. Yes; decidedly.
21. Plenty.
22. Eight head.
24. Yes, if cattle are not wild.
25. None exist.
26. Cattle are owned in bands as large as 3,000 head; sheep are herded in bands of 2,500.
28. The corners were never set according to law, and are hard to find and determine.

TIMBER.

8. We take all we want for improvements. The timber that is cut belongs to the man who cuts it.
9. No; not in this section. We would take what we needed anyhow on the coast. Where timber has a commercial value it might be better to place it in the hands of said officers in order to stop milling on government lands.

LODE CLAIMS.

None.

I humbly submit these few points to your consideration without argument or reason for want of time to write more.

Yours,

LYMAN L. HAWLEY,
Silver Lake, Lake County, Oreg.

Testimony of D. D. Munger, farmer, Jordan Valley, Baker County, Oregon, on agriculture and timber.

The questions to which the following answers are given can be found by unfolding page opposite page 1:

1. My name is D. D. Munger; residence, Jordan Valley, Baker County, State of Oregon; am a farmer.
2. Have lived on this coast over thirty years; in Oregon twenty-two, and in this valley fourteen years.
3. I sought to acquire title to 160 acres of land in this State about sixteen years ago under the pre-emption laws, but when I appeared at the land office, 80 miles distant, I was informed by the register and receiver that the land I wished to pre-empt had been withdrawn from disposal two or three days previous to my arrival at the office; and again in February, 1874, I made application for a homestead on the land that I have been living on for over ten years, but the receiver at Linkville rejected my application, as well as other applications, for the reason that I had a settlement on the land prior to survey, but advised me that I had a right to file a pre-emption on my land claim, which I did; but afterwards one of my neighbors wrote to the Commissioner of the General Land Office respecting the rejection by the receiver of our homestead applications, and the Commissioner reversed the decision of the receiver, who then advised me that I could change my pre-emption filing to a homestead entry, which I subsequently did.
4. I have been deputy county clerk of this county for the last six years, and have prepared homestead and pre-emption papers for nearly all the claimants in this part of the county.
5. As to this question I cannot answer correctly, as there have been no titles to public lands perfected in this part of the county, although one of my neighbors attempted

to make final proof of his homestead entry before the judge of our county court (which is a court of record), and sent a notice to that effect to the officers of our land office at Lake View to have it published, but the register informed him that he could only have the evidence of his witnesses taken before the judge, but would be required to appear in person at the land office to make his final proof, which decision, I think, is not consistent, according to the act of March 3, 1877.

6. I see no provision made to carry out the act of March 3, 1879, for having notice published for final proof of a homestead or pre-emption being made at any other place except the land office in case parties living at a great distance from such office, or from bodily infirmity, or other good cause, wish to make it before a judge or clerk, as contemplated in act of March 3, 1877. There are many settlers living at a great distance from their local land office, and in this and other new countries they frequently live a long distance from their county-seat, as in our case. We live over 200 miles from our local land office and over 160 miles from our county seat, and in most cases the roads to these places pass over an unsettled, mountainous country, many times unsafe to travel over during the winter snows or spring floods, and the traveler at any season of the year is liable to meet with roving bands of hostile Indians; and as there is no law to compel the attendance of witnesses in case a claimant wishes to make final proof on his homestead or pre-emption, or in a contested case, it is liable to subject the applicant for a homestead, claimant or contestant, as the case may be, to great dangers and inconvenience, and to a heavy expense; and as the settler is liable to be poor, it might cause him to lose his land. I would therefore suggest that the act of March 3, 1877, "to amend section 2291 of the Revised Statutes of the United States, in relation to proof required in homestead entries," be so amended that where a claimant for a homestead, pre-emption, or other class of lands is prevented, by reason of distance, bodily infirmity, or other good cause, from personal attendance at the district land office, that the final proof required of the claimant, or any testimony required in a contested case, or any affidavit or testimony required under any of the land laws of the United States, may be taken before any judge or clerk of a court of record of the county in which the land is situated, or before any notary public residing in such county, such affidavit or testimony to be certified to under seal. Provided, further, that where such claimant, contestant, or an applicant for a homestead, from a like cause, is prevented from personal attendance at the district land office, and also from personal attendance at the county seat of the county in which such land is situate, such affidavit or testimony may be taken before a justice of the peace of said county, duly certified to by such justice, whose official character and genuineness of signature should be certified to under seal.

I would also suggest that the act of March 3, 1879, entitled "An act to provide additional regulations for homestead and pre-emption entries of public lands," respecting the publication of notice of intention to make final proof, be so amended that such notice shall designate the place where, as well as time when, such proof will be made, and that there be proper blanks prepared for cases where such proof is to be made at other places except at the land office.

There are large amounts of land in the United States which have been granted for various purposes which have not yet been selected by the grantees; and as they are paying no taxes on them, but the pioneer who is making these lands more valuable by making valuable improvements in proximity to them, and are required to pay taxes to help support the government which protects these lands, and while these lands are not selected, it retards the settlement of the country. I would therefore suggest that where any lands may have been granted to any State, Territory, corporation, institution, or otherwise, for the benefit of any railroad, wagon-road, or other improvement, and where such lands have been surveyed, and where such rights have attached, that such grantee or grantees be required to select such lands within two years; but where such rights have not already attached, or where such lands have not been surveyed, then within two years from the time such lands are surveyed and such rights have attached; but if not selected within such time they shall be subject to disposal by the United States under the same rules and regulations as other lands under either the pre-emption, timber, desert, or any other land laws of the United States in force at the time of disposal, whereby such disposal is for money; provided, however, that all moneys paid to the United States for such lands shall be subject to the order of such grantee or grantees after deducting expense of sale and all other necessary expenses, but at any time prior to the disposal of such lands as provided they may be selected by such grantee or grantees, or by their legal representatives, and that all lands which may be hereafter granted in aid of any railroad, wagon-road, or other improvement, and not selected within two years from the time the land is surveyed and the rights of the grantee have attached, shall revert to the government, and that the records of all land offices of districts within which any such lands are situated shall show when such lands as have been already granted shall have become subject to disposal as provided, and also when lands which may hereafter be granted shall have reverted to the government.

The act to encourage the growth of timber on the western prairies only allows one-fourth of any one section being taken under it, whereas the homestead law allows the entire prairies not otherwise appropriated to be taken as homesteads. I would by all means encourage the growth of timber and allow all prairie lands to be taken under that act under proper restrictions, for timber is the great need of the prairies.

7. I live in the southeastern portion of the State; have traveled over a great portion of the State. The Coast and Cascade ranges of mountains (which are generally heavily timbered with pine, fir, cedar, &c.) run the entire length of the State parallel with the coast, with the valleys of the Willamette, Umpqua, and Rogue Rivers between them, besides various smaller valleys on streams running from these mountains. The foot-hills and parts of the valleys between the Coast and Cascade ranges of mountains are covered more or less with oak, pine, fir, cedar, and various other kinds of timber, well watered, and the valleys are a good agricultural and the hills are a good pastoral country, but pretty badly eaten out by sheep. Some gold placers and some gold and silver bearing rock, and in the Coast range some iron ore and coal and copper. In the northern half east of the Cascade range is the Blue Mountain range, running northeast and southwest across Eastern Oregon, which are generally heavily timbered with pine, fir, cedar, tamarack, &c., with some gold in places along some of the streams and some gold and silver bearing rock. Between the Blue and Cascade Mountains and the Columbia River, on the north, is a triangular-shaped country, mostly table-land, destitute of timber and covered with either bunch-grass or sage-brush, except the valleys, which were originally covered with rye or red-top grass. A good pastoral country, with some small valleys of rich agricultural land. A good many sheep, which have eaten out the grass so as to render it unfit for other stock. No mines, except a little gold in the sands of the Columbia River.

East of the Blue Mountains, hilly, rolling, and mountainous, with some valleys of rich agricultural land; timber on some of the mountains; hills generally covered with good bunch-grass; about the best pastoral part of the State; in some placers, some gold and silver bearing rock. South of this country to Nevada line, rolling, hilly, and mountainous, with long stretches of plains varied with bunch-grass, sage-brush, grease-wood, alkali, rocks and sand, and on the hills and mountains bunch-grass, craggy rocks, and in a few places juniper timber, but no other; good grazing country considering the amount of barren waste land, which is about two-thirds or three-fourths of the whole; no mines, and but very little agricultural land; too much frost to raise fruit or tender vegetables.

8. I hardly know what would be the best method.

9. It might perhaps be a good plan that when settlers have settled in narrow and perhaps crooked valleys, bounded by hills, or mountains, or rocky plains, or alkali, or sage-plains, to have it surveyed so as to have the lines follow around the edge of the agricultural land as near as might be, but not to lose sight, however, of the sectional lines, as it frequently happens that a sectional and other lines run so that in order to get 160 acres, or perhaps less, of agricultural land, that a person is required to purchase eight or ten subdivisions.

10. I have no suggestions to make on this head.

AGRICULTURE.

1. The climate in this part of the State is variable. In the valleys as a rule very cold at short intervals during winter, moderately warm in summer, but subject to frost; no rain to speak of from first of May to first of November; generally occasional rains in March and April and in November and December; a little snow in winter, but in the high mountains much more rain and snow. Some years scarcely any snow or rain; other years there is liable to be heavy and long rains in spring and autumn, and deep snows in winter. About enough water to irrigate what little agricultural land here, but in many instances rather expensive building dams and ditches to get the water where needed.

2. Rain does not fall when most needed for irrigation.

3. None in this portion of this State with success.

4. Very little; say from one-fiftieth to one one-hundreth part.

5. Barley, wheat, potatoes, a little cabbage and roots.

6. I could not tell even approximately.

7. From various streams fed by springs and snows in the mountains.

8. I do not think it has injured the land here at least.

9. The party first appropriating the water has the preference for what his ditch will carry, if it needs that much.

10. In some places all appropriated under the foregoing rule.

11. None of account.

12. From forty-nine fiftieths to ninety-nine one-hundredths, although, as I stated in an answer to the seventh interrogatory of first series, about two-thirds or three-fourths of the lands are nearly worthless for pasturage or any other purpose.

13. My judgment is that if any person wishes to establish a homestead on pasturage lands they should be permitted to do so the same as on other lands, and the same quantity; for if engaged in stock-raising they would naturally want a house to live in and some other improvements for their own convenience, and would want them on land of their own.

14. I think that it would not be advisable to put the pasturage lands in market for private entry, for the reason that the stock-raising business is the principal industry in many parts of the country, as much of it is fit for no other purpose. It is now carried on to a great extent by men of small means, and the profits are divided among the many; the poor man would not be able to buy the land, whereas if the lands were subject to private entry they would be bought up by a few rich men, and stock-raising would then be in the hands of the few, and the poor man would be forced to sell his stock for whatever the land owner saw fit to pay him, and thus he would be compelled to seek some other employment to gain a living, and the pastoral portion of the country would, to a great extent, become depopulated; the land would necessarily have to be reduced very much in price to enable it to be sold, and would bring but a small revenue to the government in comparison to the injury it would entail on the small stock-raisers. The object is or should be to frame laws so as to be of the greatest benefit to the greatest number. Where a country is settled by people who are carrying on business in their own right the country is more prosperous and the people are more contented and happy than where they are dependent on employment that others may see fit to give them; and as a general rule, where a country is thickly settled and the property owned by the masses, there is a greater revenue to the government than where the same amount of property is owned by the few. I am no enemy to the rich man, but concede to him his just rights.

18. Diminished to a certain extent.

19. Do not fence their ranges; could not with safety.

20. I think not.

26. According to assessor's report, cattle, 36,103; sheep, 18,949; horses and mules, 5,812; but I think there are about 100,000 head of cattle in the county. The county is about 200 miles long and 60 miles wide, and contains about 12,000 square miles, less than one head of cattle to the square mile.

28. There is trouble in ascertaining corners. In many instances the original corners were of soft rock, which soon crumbled to dust; and where there were mounds and stakes, cattle have rubbed down the stakes and tramped down the earth mounds, so that they are not visible, and most of the stakes are gone.

TIMBER.

1. None in this part of the State, but a little about 25 miles from here, near Silver City, Idaho.

2. None planted here.

3. I would sell timber lands to actual settlers only and in limited quantities. Say, for very best of heavy timber, such as redwood, 10 acres at $10 per acre; good heavy timber of best quality, except redwood, 20 acres, at $5 per acre; good timber, 40 acres, at $2.50 per acre; poor timber, 160 acres, at $1.25. I would think it best where there are mines and mining towns to collect stumpage, and have pay for all the timber felled whether wasted or used; and where there are large bodies of timber, and it is needed, have foresters appointed, and all timber cut under his instructions and superintendence. I think it would be a good plan to reserve one-half of the timber lands, where there are large bodies, for the future.

D. D. MUNGER.

Testimony of W. S. Newby, farmer, Yamhill County, Oregon, on agriculture and timber.

McMINNVILLE, OREG.,
December 20, 1879.

DEAR SIRS: In reply to your interrogatives submitted to me, I would state that my name is W. S. Newby; residence, McMinnville, Yamhill County, Oregon; occupation, farmer and grain merchant. I have resided in this county since the year 1844 (or thirty-five years).

I acquired title to 640 acres of government land in the year 1850 under the law known as the donation law of Congress in the year 1850. My knowledge of the practical workings of the public-land laws has been from personal experience and observation.

The time and expense ordinarily incurred in procuring a title to public land in uncontested cases would be from three and a half to six years, at a cost of from $20 to $220; this of course depends upon the kind of land located and also under what law it is in

accordance with. As to contested land cases it would likely terminate as other legal cases; the time and expense necessary to adjust the matter would be uncertain. I don't just now call to mind an actual case of this kind containing anything important.

In regard to the defects in practical workings of the land laws, I think upon the whole, as far as the same has come to my knowledge, that they have been very wisely formed; and with a majority of the honest class of people are quite satisfactory; at least such has been the case throughout this section of country.

The character of the public lands in this county (generally speaking), the soil is a dark rich loam, calculated to produce crops for many years successively without manuring; at least such has been the case (or result) of many years of practical use of adjacent lands of a similar character throughout this county and in fact the Willamette Valley.

I presume it safe to say that two-thirds of the public land in this county are pastoral and timber lands; possibly more than one-third might be termed agricultural.

I think that the government can ascertain and fix the character of the several classes of public lands in this and adjacent counties by a general rule; this I think would be more satisfactory than otherwise.

The present system of land parceling surveys, in my opinion, is well adapted to the majority of lands for settlement, as under the various general land laws settlers can obtain, as a rule, all the lands of either class desired.

The climate in this county, and in fact throughout the entire Willamette Valley and coast range, is quite mild, the warmest temperature seldom exceeding 100° in the shade, and the coldest weather never being more than an average of 6° below zero. Fall-sown wheat does splendid, often yielding from 45 to 54 bushels per acre, and it is a rare thing that the freezing weather injures the wheat crop. The usual time of year the rainfall begins is from the 1st to the 10th of October, and is liable to continue at intervals until about the first of to the middle of March, after which time we often have nice growing showers during the months of April, May, and June.

It is a very rare thing to see the low lands covered with any depth of snow, and then not lasting more than from two to four days.

Irrigation is a thing hardly known, and never employed by farmers; consequently, we may say that all of our lands can be profitably cultivated without irrigation.

The highest hill-tops along the coast range have produced abundant crops whenever cultivated.

The proportion of lands adapted to pasturage only, I think might be placed at about one-third of all.

I should think the average amount of land required to raise one head of beef for market would be three acres; this section compares favorably with other sections in this respect.

I would think from three to four head of cattle sufficient to support the average family.

Yamhill County contains 285,641 acres of land, 6,503 head of cattle, 20,837 head of sheep, as per assessment of 1879. Cattle-raisers usually fence a portion of their ranges at least. Yes, cattle can be confined safely on their ranges during the winter months by fencing.

In grazing I think that four sheep are equal to one head of cattle. Sheep and cattle will not graze on the same land if left to choose their pasture. Horses will graze some with sheep. I think, as a general rule, the grass has diminished when it has been pastured by sheep.

The supply of stock water is good in most localities—better, I think, than found in a majority of the stock locations.

I don't think there would be any trouble in ascertaining the corners of the surveyed public lands in this county.

The amount or proportion of timbered land throughout this section I would estimate at about two-thirds the entire public lands of this and adjoining counties.

The timber in this county is principally fir, oak, ash, and alder, and as to quality will compare favorably with the timber in any country; in fact, it is acknowledged to be of superior quality whenever tested.

Usually when forests are felled there is a second growth of timber, which grows very rank, and therefore is quite frail when matured.

As to the origin of forest fires, it is hardly possible to give you a definite answer, as there are various ways understood from which they might originate.

Some years ago their destructiveness was much greater than of late years. I think as the lands are settled this difficulty will gradually grow less serious. I think these fires often occur from carelessness of travelers and hunters in leaving camp-fires to take care of themselves, &c.

As far as my knowledge goes, I don't think the depredations upon the timbered lands very serious, at least in this county; for of late years I am satisfied that persons are more conscientious about cutting timber on public lands for private purposes.

I think it would be advisable and advantageous, for obvious reasons that will occur

to you, to place the timbered lands within the jurisdiction of the United States district land offices; this surely would be more convenient to persons wishing to purchase and locate these lands.

We have no mining claims or mining interests in this section of country; consequently I am unable to give you any information in this direction.

Hoping that in answering the questions submitted to me, this brief reply will be satisfactory,

I am yours, truly,

W. S. NEWBY.

Testimony of L. S. Burnham, near Salt Lake City, Utah, relative to agricultural lands and lode claims.

SALT LAKE CITY, UTAH, *December* 14, 1879.

To the Public Land Commission:

1. L. S. Burnham, 10 miles north of Salt Lake City; farmer.
2. Twenty-five years.
5. Many fraudulent entries; vicious protests (frontier administration).
10. Only desert land entries (greatly altered); too quick; impossible.

AGRICULTURAL LANDS.

Never allow more than eighty acres of desert land filed on by one man and a fee of say $25, on conditions of reclaiming and inhabiting the same within three years; prove the same and receive a patent fee, and we will have fifty times as much land reclaimed, fifty times as many agricultural homes, and twenty times as many school-houses. By all means give a government commissioner or commissioners to make personal examination of all protests or disputes, ascertain the facts as by law, and correct any wrongs, save a thousand poor farmers, and a hundred thousand lawsuits.

I have somewhat extended experience in this western world in farming, irrigation, and mining, especially mining lodes, for twenty-five years in Utah; born in Vermont; lived there to manhood; farmed fifteen years in Illinois; now sixty-three years of age; five sons around me, farmers.

MINING LODE CLAIMS.

21. Alter the laws; let all lode claims consist of not more than 1,500 feet length and not more than 1,000 feet in breadth; surface measure horizontal, end and side lines vertical, with square corners; possessory right ninety days to recording with district recorder (a county recorder); 120 days to survey and recording in district land office, if there be one, and one year to government purchase, or forfeiture, subject to relocation by any other party or parties under a new name.

The above, as laws, would stop millions of loss in lawsuits, and stop a multitude of blackmailing, and open many valuable mines that are silent and shut down in quarrels. And give aforesaid commissioners jurisdiction over mineral as well as agricultural land disputes, with a salary, and never fees.

I could post you somewhat on ranching, farming, mining, timber, water, irrigation, &c., but can't write as much as I can think. Congress need not bore artesian wells; the above proposed desert land laws will bore one thousand wells to Congress one.

Truly yours,

L. S. BURNHAM.

Testimony of William E. Hall, miner, Big Cottonwood, Utah, relative to agriculture, timber and lode claims.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

1. William E. Hall; miner; Big Cottonwood, Utah.
2. Seven years.
3. Yes, mining lands.
4. None.
5. There has been considerable unnecessary expense in getting public-land titles, because of defective laws.
6. There are many defects; have not time to write them.
7. Mining.

8. Geographical division.
9. For mining, say, give each party 40 acres; it would give plenty of room for every purpose connected with mining.

AGRICULTURE.

1. Plenty of snow in winter.

TIMBER.

1. Not much; pine.

LODE CLAIMS.

1. Thirty-five years mining and mining superintendent.
2. There are many defects in the United States mining laws; have not time to answer them.
4. I understand it to be the outcropping of the vein. By no means, no; have known many instances of this kind.
5. Parties so located ought to have time to determine the course of their vein.
6. Yes, most decidedly; great injustice.
7. Yes; many cases of this kind have come under my notice.
8. Yes.
9. No.
10. Yes.
11. To the disadvantage.
12. Should not cloud A's title.
13. Yes; this is often the case.
14. Yes.
15. Yes; Big Cottonwood. Partly miners, the rest citizens.
16. Local records and customs generally are unsatisfactory.
17. Yes, by miners meeting.
18. Yes; none.
19. Yes.
20. Yes.
21. A man should follow his vein wherever it went on his side lines 40 acres.
22. No; yes; two years.

Testimony of Joseph Hatch, Salt Lake City, Utah, relative to timber, timber laws, cutting of timber, destruction of timber, protection of timber, timber in the pasturage lands.

Joseph Hatch, of Heber City, Utah, testified at Salt Lake City, September 17, 1879, as follows:

I am acquainted with the timber country of the Wahsatch and Minto Ranges. As I understand the timber law, it does not allow parties to cut growing timber under 8 inches. My opinion is that parties fire the timber to kill it, so that they can get dead timber for nothing. I think the timber land ought to be protected in some way, and that the timber law might be better administered if it was in the hands of district land officers. The timber is being very rapidly destroyed by fire. The next two years will clear the timber in the pasturage lands, if fires are like they were last year. The most of these fires are purposely set, so as to obtain the timber without violating the law.

Testimony of Mason M. Hill, Salt Lake City, Utah, relative to lode claims.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

United States Public Land Commission:

GENTLEMEN: Replying to your questions asked, I herewith write answers *seriatim:*

1. I have had experience in organizing mining districts, locating mines, superintending developments, tracing and experting, buying and selling, and the business sometimes attended with litigation, both for the companies for whom I acted and with myself personally. Places, California, Nevada, and Utah. From dates 1861 to 1864 in the former States, and since 1864 until now in Utah.

2. Seeming defects in the United States laws will be only briefly suggested in giving specific answers to succeeding inquiries.

3. No overlapping surface claim should in any instance be accepted by surveyor-

generals so long as miners' records are permitted as having even a color of validity for evidence of possessory title. Any conflict involving "fee" title either to surface ground or lode should be adjudicated by a court of competent jurisdiction before any survey of a claim is accepted, or, rather, patent issued.

4. The top or apex of a vein or lode is where it has been projected through the country rock by an acting subterranean agency or force. Surface slides may cover it afterwards or obscure it so the "apex of vein" may be several feet from the surface, but still the "apex" where found incased in defined wall rock, or between two formations defined as a contact vein.

The apex can be determined when found, but the course of the vein *carefully defined* means oftentimes expenditure of time and money. Its "angle or direction of dip" must be somewhat a matter of conjecture from any judgment based upon "early workings" of lode.

5. I do not think "discovery rights" are or can be protected from encroachments or litigation by any location now made, but I suggest further legislation should compel discoverer to definitely define his discovery or claim.

6. Some litigation and injustice have grown out of the impossibility to determine points above stated, but more on account of neglecting to determine them when it has been possible to do so.

7. I have known of two seams parallel, located by different parties, giving rise to contests and litigation.

8. I have learned in most instances afterwards deep mining developed a junction of the seams sometimes very low down in ledge.

9. The outcrops of lodes are often wider than the present legal width of claims, whether located under United States or State laws.

10. The outcrops very often deviate from a straight line, and sometimes pass beyond surveyed side lines.

11. It may be used to advantage by discoverers of true lodes; but, better still, I suggest allow greater surface width in survey for patent. This will prevent this privilege of location to be used to his disadvantage.

12. B can, who has discovered nothing, cloud the title of A, and often extracts and carries away his ore before being traced out, and compels the discover often expensive litigation. The instances in Utah courts are too many to state or give particulars.

13. The first question in query 13 I answer yes. To second I answer, "Legal attacks or invasion of discovery rights are about equally divided in being directed to dip of lode passing beyond exterior lines below surface," and in commencing mining work on surface ground exterior to located or patented lines, and prosecuting work to strike discovered ledge anywhere in its course down but away from main work or developments by discoverers.

14. A provision by which locators can secure and quietly have what they discover they have a right to ask. The lode in its depths may be the most valuable or, indeed, all that is valuable in the discovery. Greater surface width at the option of the locator to prevent invasion of his discovery right should be given him legally, and if he fails to protect himself it will be his own fault. I disapprove any legislation that would stimulate mining work to secure valuable ore deposited in a lode at a low angle or dip in its course outside of the discovery rights to follow hanging and foot wall in the interests of the discoverer. The ledge is found in its depths by a surface discovery, and should not be parted in justice to the discoverer. Only another form of litigation would result by a mining provision contemplating its possibility, viz: the acquiring rights by doing mining work with the end in view of segregating a lode linearly where its dip takes it out of its exterior surface lines. The ore body found means all of it, limited linearly only by end lines or stakes, and the United States limitation provision in this respect is only a fair provision of law.

15. I answer, I have, both in Nevada and Utah, several of them. At Reese River, in Nevada and several districts in Utah, including the discovery and organization of Paranagat district, in the extreme southern portion of the Territory, in the year 1865. The only officer generally was a recorder, and the only book a common blank book wherein to record claims.

16. The mode generally has been to fix boundary limits to a district by some prominent natural objects: mountain passes or streams, or all combined, name district, take up ledges in mountains by following float ore or discolored seams on mountain sides, or mineral stained outcrops of country rock. The direction of the lode has been considered a reserved right of the discoverer to determine by after mining work as well as the dip or direction of lode in going down. His location notice has been generally posted on ledge with supposed direction of vein according to compass points, and at same time left with district recorder, stating in what mountain or near what natural objects outcrop or notice may be found. In a majority of claims this preliminary work has been done so imperfectly, these records would aid but little even in finding the lodes or veins they contain or describe. The effect of this imperfect record

location has been, however, to enable the real discoverer to hold his claims, oftentimes however with great difficulty.

17. I can only suggest an amendment to all district records in the past by outlawing them in their present form. Some limitation act compelling a legal form of notice which would take all the valuable locations out of the old district record books, compelling defined lines and monuments or stakes showing claim boundaries, would prevent innocent purchasers from losing often in making investments hereafter.

18. Answering this question, I have; and only suggest as the most perfect security against frauds here to outlaw the record made in any mining locality, both those already made and those that may be hereafter made. Allow the miner, say, one year for such record to be thereafter verified and filed in a mineral land and lode record to be kept by register of the United States land office.

19. The land offices are too few and oftentimes too distant for immediate record of a mining discovery. A quiet record, including district record with a mineral record, to be kept only at the United States land office, with legal forms and notices of locations and filings, are necessary. All mining locations to be finally entered at least within a year at the register's office, and claims subject to relocation by failure to do so.

20. Mining controversies should not be left to United States land offices when title or legal acts or facts to be settled by a jury arise.

21. I approve the legal provisions of the United States mining laws so far made. Amendments should be made including following suggestions: Work done on any claim sufficient to get a patent and buy surface rights ought to release, legally, owners from a yearly work assessment or expenditure. An additional time to secure patent thereafter should be allowed, but time of possessory title limited for holding claim, unless a certified amount, say $5,000, has been so expended in development and necessary mining improvements without disturbing discovery title connected with a true following of vein in its dip. I would give additional surface rights, at the option of discoverer, with right to lodes undiscovered therein, confining him linearly to 1,500 feet, as now provided.

22. A possessory title ought to be limited, but the extraordinary expenditure necessary to get a patent for mines of mineral lands should be so changed as to enable a poor miner to get his patent. In some instances it now costs from $300 to $400 to get a patent for five or six acres of land on a mountain side. Locators, if compelled to patent claims, should be able to do so for a reasonable sum. United States surveyors are employed by the miner to do his work dictated and controlled entirely by United States officers of the locality. Charging the miner for his time, those who pay not for it have the power to make a little work very expensive. It is done in almost every instance when application is made for a patent.

I will extend statements and suggestions in answer to queries Nos. 21 and 22 when answering questions under head of placer mines in a letter which I will send you hereafter, the same now having been omitted for want of time.

Very respectfully,

MASON M. HILL,

SALT LAKE CITY, UTAH.

Testimony of Charles W. Stayner, attorney-at-law, Salt Lake City, Utah relative to homestead and pre-emption laws, canals for irrigating, settlers' claims, desert land act, timber and mineral lands. Land laws—amendments suggested.

SALT LAKE CITY, UTAH.

GENTLEMEN: As an attorney practicing in Utah, and having some experience in land cases, as well as some knowledge of the difficulties under which the settlers of this Territory have to labor, both as regards land and timber, I herewith present for your consideration a few suggestions which are the result not only of my own observation, but of others who have constituted me their representative in these matters.

First. In regard to the homestead and pre-emption laws. I would respectfully call your attention to a memorial of the governor and legislative assembly of the Territory of Utah, approved February 22, 1878, and to be found on pages 168 and 169 of the printed laws, memorials, and resolutions passed at the last session of the assembly. This memorial shows that settlers upon public lands in this Territory are "frequently distressed by the lack of water for domestic purposes, or the brackish and unwholesome nature of the water there obtained from wells, until by the construction of canals for irrigation water is brought through such land suitable for general use;" and the document proceeds to ask for legislation that shall extend to *bona fide* builders of canals and ditches the benefit of existing laws in such a manner that so much means or labor expended upon such canals may be counted equivalent to a given residence on the land under the homestead act; proper and adequate proof to be given before the local land officers. I would urge your consideration of this subject as set forth in said memo-

rial, and also suggest that the legislation be extended to include settlers under the pre-emption act, and to provide that a portion of the money and labor expended on said ditches and canals be allowed to apply on the purchase-money for said land. I would further represent that, in numerous instances, settlers being compelled to make actual residence on their claims for *at least six months*, are put to the expense of building a dwelling of some kind, and of moving their families on to the tract, and during said period and until the land is paid for are limited for daily use to the unwholesome water that prevails on land impregnated with alkali; that some do, when practicable, haul water in barrels from the settlements or from the nearest creeks; that these settlers are subjected to this inconvenience and expense without any good resulting either to the settler or to the public, as in most cases, if not in all, the settler will, as soon as the six months expire, if possible, make his cash entry and immediately remove to a more healthy and comfortable neighborhood. He has in the meantime expended money and risked health, and in some cases life itself, to fill the law, and yet made no permanent improvement, except the cultivation of part of the land, which could have been done with greater ease and to a wider extent if the building and moving had not been required.

I think that the making of irrigating ditches and canals, the building of fences, and a general improvement of the tract by cultivation, would result in far greater good to the settler and to the public at large than the building of a shanty which is removed as soon as the law will permit that made it a necessity.

Furthermore, families are in many instances removed miles away from the settlements where they have congregated to protect themselves from Indians, and are compelled to live out on an open prairie where they are subjected to continual dread, if not actual danger, and are deprived of medical aid in cases of sickness, which is at times quite prevalent here as elsewhere, especially among the children. The younger members of the family are also debarred from the advantages of school education, and thus lose months, and perhaps two or three years', schooling, owing to the poverty of the settler, who frequently cannot raise means to pay up for his land at the end of six months, and must remain a resident upon it till he can and does do so. His opportunities for raising the purchase money are also curtailed, through his being compelled to remain on the tract, as he is debarred from working for money, which he might do, were he permitted to retain his residence in the settlement. Thus his payment is retarded sometimes till the expiration of the allotted period of thirty months, and the government is a loser as well as the settler. The land is filed on by some other claimant, and the original settler is regarded as having abandoned and forfeited his pre-emption claim, notwithstanding his residence and his improvements, which may be very extensive and valuable.

Secondly. In relation to the desert act. This law evidently should be modified so as to provide that when parties have expended a certain amount of means or labor in turning streams of water from their natural channels, in order to reclaim a tract, and have not at the expiration of the three years allotted thoroughly accomplished the reclamation of the land as required, they may, on proper showing and proof before the local officers, obtain an extension of time to complete their work; and, furthermore, some portion of their expenditure should in my opinion be allowed on the price of the land unless the general price under this act be reduced, which would be preferable and perhaps more just to rich and poor alike. In that case the price ought not to exceed 25 cents at time of entry, and 25 cents additional at time of final proof, for in nearly all cases of desert land in this Territory the land is very inferior, and the expense needed to reclaim it by irrigation is exceedingly heavy.

Thirdly. I would call your honors' attention to the anomalous condition of this Territory regarding timber. Differently situated in many respects from other parts of the country, the agricultural classes, of which the inhabitants of the Territory principally consist, are suffering under the exacting provisions of laws made for other regions and for different objects from those which prevail here. On observing the visible mountain-sides, it is palpably manifest that no timber grows upon *them*, but in order to reach the timber or even fire-wood the settlers must go far into the recesses of the cañons, and the spots where timber is usually found are frequently, if not always, outside the limits of mining districts and of lands classed by the government as mineral. Consequently the cutting of timber and wood as generally carried on is not authorized by but is in direct violation of the law authorizing residents "to fell and remove timber for building, agricultural, mining, and other domestic purposes," approved June 3, 1878, which limits such privileges to *mineral lands only;* and the settler so using the timber is liable to criminal prosecution under section 2461, United States Revised Statutes, which was evidently passed to protect timber for the use of the Navy, and not in any manner to affect people in this inland Territory.

These two laws should be so amended as to permit timber to be cut in our cañons on lands *other than mineral.* I would also represent that a provision forbidding the cutting of timber measuring less than eight inches in diameter, and contained in the rules and regulations issued by the honorable Commissioner of the General Land Office,

is too general in its character, in that it may be construed to restrict the cutting of scrub brush which is only fit for fire-wood, and which never measures more than eight inches in diameter. This brush constitutes the principal fuel in some parts of the Territory, its removal is no injury to the timber required for other purposes, it would never grow into timber of any useful size, and yet the settler is unwittingly liable to harassing suits for an infraction of the United States law above referred to, or a prospective tax upon every load of such wood hauled by him, and which has cost him in labor on the cañon roads, and in time spent in hauling it, all that the wood when hauled could possibly be worth.

Your honors will perceive that the above suggestions are offered chiefly in the interest of the farmer and the working man, in whose behalf I respectfully solicit your consideration and influence.

I am, gentlemen, very respectfully, yours,

CHAS. W. STAYNER.

Testimony of D. P. Ballard, lawyer, Yakima City, Wash., relative to agriculture, timber, and lode claims.

The questions to which the following answers are given will be found by unfolding page opposite page 1:

YAKIMA CITY, WASH., *October* 3, 1879.

To the Public Land Commission, Washington, D. C.:

GENTLEMEN: Agreeably to your request, I beg leave to submit the following in answer to your questions contained in circular, and herewith forward as requested.

1. D. P. Ballard, lawyer, Yakima City, Wash.
2. Two years.
3. Yes. Soldiers' homestead and pre-emption.
4. By transacting business for others.
5. Uncontested—average cost for homestead, $23.50; time, ten days. Contested—cost, $150; time, forty-five days.
6. Yes. There are too few land offices, and permitting parties to "prove up" or "make filings" before clerks, &c., opens wide the door of fraud and favoritism. These "clerks, &c.," having plats forwarded to them from land office 150 to 250 miles away, "cover up" special claims to accommodate pets. The homestead and pre-emption laws being made for the poor, no fees should be charged for "entries." Also require contestants to proceed in local courts.
7. Between Columbia River and Cascade Mountains—low mountain or hill covered with bunch grass and sage brush, and valleys varying from 1 to 30 miles wide and 10 to 100 long. All pastoral and agricultural well up into the Cascades to timber line. Small skirts of timber along streams.
8. No general rule or geographical division will do, unless we call lands agricultural, pastoral, and timber, the word "timber" not to include lands covered with brush, balm, or cottonwood, but such to be classed as pastoral in this entire Territory east of Cascade Mountains.
9. Have been county surveyor. Do not think I could now recommend any change.
10. Let each homesteader and pre-emptor, in prairie countries like this, with all the timber in mountains, and where we go from 5 to 30 miles for fuel, &c., be allowed to pre-empt 200 acres—160 prairie and 40 of timber—whether adjoining his home or not. Give each soldier of 1861-'65 a land warrant for 160 acres. Let sawmill men buy in tracts of 640 acres, and when any three county officers certify that that 640 is "skinned," sell another section. Charge settlers—that is, agriculturists—$1.25 and sawmill men $2.50 per acre.

AGRICULTURE.

1. Short winter, long summer. Rain in early spring and late fall. Season from March 15 to December 25. Snow one-half foot to four feet deep, according to locality. Plenty of water for irrigating.
2. Spring and fall—two-thirds in spring. Yes.
3. One-half of all tillable land, being about one-third the whole.
4. One-third the whole.
5. Wheat, oats, rye, barley, corn, buckwheat, apples, peaches, pears. All small fruits and vegetables.
6. Do not know.
7. From mountain snow which melts in May, June, &c.
8. By irrigation the fertility of soil is increased, as is evident from the fact that the tenth and twelfth wheat crop (as other grain) is better than the first, and no manure used. Three thousand feet above sea.

9. One-tenth to one-fourth exhausted. After two or three years the land becomes "full" of water and requires little or none. Both. Custom and common law with act of July, 1866.
10. So to speak, none "taken up." Riparian owners, by custom, facilitate its use.
11. None, worthy of note.
12. One-third.
13. No. But if, then 640 acres.
14. No, by no means. We have 300,000 cattle and horses now living on these lands. But if yes, then 640 acres to each man (on account of rocky wastes) and at 25 cents per acre.
15. One acre (grass) favorably.
16. This question is not easily answered, for it is too general.
17. Not over two or three.
18. No perceptible change.
19. No. No.
20. No. It would d—n us.
21. Plenty.
22. Do not know.
23. Diminished.
24. Yes, and no—owing to locality.
25. None so far.
26. Sheep, 100,000; cattle, 300,000.
27. None.
28. Yes. Corner stakes rotted and gone; mounds poorly made.

TIMBER.

1. A strip 20 to 45 miles wide extending from south to north line of Territory. Pine fir, cedar, tamarac, and very little oak. All excellent but oak.
2. Cottonwood, Lombardy poplar, and walnut in valleys. First two. Time, eight to twelve years.
3. By sale. See answer to question 10.
4. Classify both in kinds and size of tracts.
5. Yes; scrubby in part. Twenty years.
6. Are result of camping fires. Small in extent. Make it criminal.
7. Railroad cut extensively, and should pay. Miners, builders, &c., should have it free, as they waste none. Make it felony for corporations to depredate, except for mining, &c.
8. Lent *ad libitum*. First who gets it.
9. No; unless land offices be increased in number. Then, yes.

LODE CLAIMS.

1. South Western Missouri. Lead and zinc.
2. Not posted.
3. Can give none.
4. No; to last part.
5. I think so.
6. Cannot say.
7. Have heard so.
8. Decline to further answer respecting mining.

D. P. BALLARD.

Testimony of James T. Berry, surveyor, Chehalis, Wash., relative to agriculture, timber, and placer claims.

The questions to which the following answers are given will be found by unfolding page —:
1. James T. Berry, surveyor; Chehalis, Wash.
2. Eight years.
3. I have homestead; 160 acres.
5. I obtained my patent within forty days after making final proof, uncontested.
6. I think it a needless expense to have to travel to register's office to file and make proof.
7. We have agricultural, pastoral, and mineral lands. The river and creek bottoms are good, productive lands. The Burnt Hills pastoral, generally coal deposits.
8. General rule. Not possible by geographical lines.

9. I think the level and bottom lands unsurveyed should be subdivided in sections to suit shape of lands, and the mountainous regions left to be selected as wanted by mining parties.

AGRICULTURE.

1. The climate is even and beautiful here. Rainfall great. No irrigation necessary.
2. From October to June. There is always sufficient water-supply when most needed for growing vegetation.
3. All.
8. At from 1,200 to 1,600 feet altitude.
13. I think, one section.
14. Only by actual settlement.
18. Increased.
20. I think so.
21. Plentiful.
24. No.
25. Cattle will not remain on sheeps' pasture.
28. In some few cases the corners are now hard to determine, especially where fires have occurred.

TIMBER.

1. The land has been once all timber.
5. I know of several fir forests, with no living cedar now, that once had fine cedar, which had been destroyed by fire.
6. The natives set out the fires, which are very destructive to both soil and timber.
7. The depredations are very limited in this county.
9. Perhaps so.

PLACER CLAIMS.

1. Coal and iron are very extensive; I believe coal underlies nearly half the surface of our county, 1,000 miles square.

Testimony of A. K. Bush, Riverside, Wash., postmaster. (Abstract.)

Suggests the following defect in the present laws: "Under the ruling that those who notify on homestead claims and fail to perfect title may notify on another claim, it is a common practice to take off marketable timber, abandon, and relocate."

The soil and climate of at least the larger portion of the Territory favors the growth of cereals, except corn, for which the nights (on the coast range especially) are too cool. The yield of grass is very great on both hill and valley lands. Apples, plums, pears, cherries, and most small fruits yield largely and are of fine quality. Peaches, grapes, &c., on the portions bordering on the ocean cannot be grown to any advantage, for want of sufficient warm weather.

There are many tracts of excellent timber available for manufacture of lumber, for ship-building, farm-building, &c. This land, when cleared, will produce a large growth of grass, and that portion which is not too hilly or rolling for cultivation will grow grain, vegetables, &c. All kinds of hardy vegetables yield largely, and are of fine quality.

There are indications of coal deposits in this county, in one or two places particularly. The deposits are believed to be large and easy of access.

Rainfall 49 inches and upwards; rainy seasons generally commence November 1 to December 1, lasting until April or May; February often dry and pleasant; snow in western part of Territory almost unknown; country well watered by streams, large and small, springs, &c.

Tide lands on bays and rivers (unless diked) and hills too steep for cultivation.

Would dispose of timber lands by homestead to those wanting homes, by sale to mill-owners in tracts from 160 to 230 acres, if within available distance of their mills, at from $2.50 to $5 per acre, according to location, timber, &c. I would suggest that 640 acres be the very extreme sold to any one firm, unless in some country good for nothing but timber, and that we do not have in Washington, so far as my knowledge extends. If not limited, many will purchase large tracts, even where no mills are built, hold it for years, and thus prevent others from getting it who would build mills and manufacture it into lumber, &c.; also retarding settlement of country. There is much timber stolen by mill-owners and others furnishing logs to them. Would suggest that men be appointed and means be furnished to enforce laws already enacted. Laws not enforced are worse than no laws at all.

I do not think it would make much difference where the authority was vested, if all departments were alike honest and men who would act without fear or favor were appointed in each different section of country where such depredations were likely to occur, to look out for such depredations and report to the proper authority, &c.

Respectfully,

A. K. BUSH.

Testimony of Hiram Dustin, Golden Dale, Klikitat County, Washington, relative to agriculture, timber, and lode claims.

The questions to which the following answers are given will be found by unfolding page —:

To the Land Commission:

MESSRS: Having received a pamphlet containing interrogatories, I proceed to answer such as have come within my knowledge and observation, and also to offer a few suggestions in relation to your business as commissioners.

1. I am a resident of the town of Golden Dale, Klikitat County, Washington Territory, and have been for about two years.

2. I have not acquired or sought to acquire title to any of the public lands in this Territory, but located a homestead in Oregon some nine years ago.

3. Being in the practice of the law in this county, I have had occasion to examine the present land laws, and believe that, as a general thing, they are efficient and produce the intended results, with the exception perhaps of the act in relation to soldiers' additional homesteads, which I think is an instrument placed in the hands of monopolies—provided they see fit to avail themselves of it—that will do great mischief because of the vast quantity of soldiers' additional homesteads now for sale. I think the intention of Congress was to benefit the soldier, and that no one person should have a right to buy them up and locate more than one tract of land; but as it now stands a man can locate as much land as he can buy soldiers' floats to cover.

The physical character of the country in this county is rough and mountainous; there is not over one-third of this county that is adapted to farming, a greater portion of it being timber and pastoral lands.

This is a temperate climate and very dry. The snow falls on an average about one foot deep. Some winters, however, there is scarcely any snow at all. The rain falls most late in the fall and during the winter. There is but very little irrigation of crops in this county; but in Yakima County, joining us on the northeast, they irrigate all crops; in fact, there is no certainty without it. My observation of irrigation has led me to believe that it is an injury to the soil in certain localities, while crops seem to grow rank by its use. I think the land will sooner wear out. In Yakima Valley there is the finest chance for irrigation; the land is level, and the streams rise high up in the mountains which surround it and spread promiscuously over it. The farmers have brought two very nice ditches from the mountain streams, which afford abundant irrigation.

With regard to pasturage land, I would suggest that it would be a good idea for Congress to pass an act allowing persons to locate pasture claims either as a homestead or allow them to purchase a certain quantity at, say, $1 per acre, but not allowing any one person to locate over 200 acres. This, I think, would keep on an average about one hundred head of beef. Of course some parts of the country would do, I think, still better. There is plenty of beef cattle in this county, but as to the amount to the square mile I am not able to say. There are also large herds of sheep in this county, which bring more money into the county than from all other sources combined; but still they are not a success, as they eat out the range and destroy it. One sheep, in my opinion, is more destructive on grass than a full-grown cow, and the growth of grass is invariably diminished wherever sheep are pastured. I shall answer a few more questions with regard to the timber.

I cannot say how much timber there is in the county, but will say that there is an abundance of it, and mostly pine, which makes the finest finishing lumber we have in the market; I do not think it is excelled on this coast. There is, however, sections of land without any timber, and upon a number of such persons have located timber claims, under the timber-culture act, but as yet I fail to see the timber growing. In fact, I do not think there is twenty acres of timber planted in the valley. The people generally make raids upon the government timber lands. We have some six or seven sawmills in operation in this county, all of them cutting timber from government land. What ought to be done under the circumstances is a little hard to determine, yet I shall suggest a remedy. Let Congress pass an act allowing persons to cut timber on the government land by paying a certain revenue, and have some one appointed in each county to look after it and collect it. Something of this nature must be done or else

the laws must be put in execution, because in a few years thousands of lumber will be shipped away from this county to supply other parts of the Territory.

It is argued by some that it is not to the interest of the farmer that the mill men or the wood men should pay stumpage, for the reason that they would be the losers—being the consumers would have to pay the bill. I ask, would it not be far better for to pay a moderate revenue and thereby protect our timber and prevent its being destroyed, than to get our wood and lumber a few cents on the thousand or cord for a few years and then have none in the county at any price?

I do not wish to bring any one into trouble in expressing my views, but there is no question but what there should be some steps taken to arrest the wholesale destruction and robbing of the timber of the government. Either make them pay stumpage or compel them to purchase it. The worst of it is transient mills or portable mills can be built almost anywhere in the mountains, and when they have culled out the very finest of the timber, they simply move to another and better place. By this means the finest and best of the timber is being used up. Of course in time there will be a second growth, but its growth is very slow, perhaps twenty years before it would be of any consequence for poles or fire-wood.

As for lode claims I have had no experience whatever. There is, however, I learn from prospectors, good ledges or lodes not yet developed in this country, which will be a source of great wealth to the country at no far distant day, and there is no doubt in my mind but what Washington Territory will in a few years rank among the first agricultural and mineral States in the Union.

In conclusion, I would say, gentlemen, I hope you will excuse me for this very brief epistle and indefinite description of our country, but as I am not a traveler my knowledge of those things to which your attention as commissioners is called to is very limited, but this pamphlet was sent to me by the land agent of Vancouver, W. H. Smallwood, and I complied with his request to the best of my ability.

Yours, &c.,

HIRAM DUSTIN, *Attorney-at-Law.*

GOLDEN DALE, WASH.

Testimony of Edward W. Smith, Evanston, Wyo., relative to the public lands, stock, water rights, surveys, cattle and sheep ranges, the sheep and cattle men, pastoral, homestead, timber lands, land surveys, arid and humid regions.

EVANSTON, *November* 4, 1879.

EDWARD W. SMITH, of the firm of Beckwith, Gwynn & Co., bankers, merchants, and cattle dealers of long standing at Evanston, testified as follows:

I know the land in this district well. It consists mostly of grazing lands, and there is a little timber, with some precious metal. There is also deposits of coal in the district. There is no rainfall, and but little snow. There is so little agriculture in the district that it is hardly worth while to take it into account; it is all done by irrigation. The timber on the high mountains is spruce, shaking aspen, and cottonwood. On the grazing land bunch-grass predominates, intermingled with a little sweet swamp-sage. The rains decrease under grazing, and it takes about five acres to support one beef. I call this district a grazing district. I should say there were 100,000 head of cattle and the same number of sheep in the district. Calves are worth about $5; yearlings $10, and two-year-olds about $15. Beef cattle are worth $20 apiece, or two and one-half cents per pound gross weight. Sheep are worth $1.50 to $2.50 common for mutton, and 20 to 28 cents at the railroad. From 5 to 8 pounds of fleece can be cut from each sheep annually. Our cattle are mixed and graded; the breed is steadily improving, because of the liberal introduction of blooded bulls.

In the southern part of the district the water-rights have mostly been taken up for cattle and sheep. In that country there is a rule established by custom that the first appropriation of the water holds and controls it.

The district has not been wholly surveyed; the survey should be extended over the public lands in this district.

Cattle and sheep ranges are held by suffrage and custom. There is now a law of the territory which prevents trespassing upon occupied ranges near settlements, but away from the settlements the shot-gun is the only law, and the sheep and cattle men are engaged in a constant warfare. The sheep men are generally the aggressors. Their sheep destroy the grasses, and the cattle will not again graze on the land. If the stock owners could obtain absolute control of their ranges under United States laws, the value of the herds, both cattle and sheep, would be materially increased, both as regards beef and mutton and the wool, and peace and quiet would supersede the present turmoil.

The lands in this district are all arid, and there is no water for irrigation. The land should be surveyed and sold, in quantities to suit the purchaser at, say, 10 cents per

acre; or I would lease or let them, referring all questions as to their occupancy to the district land officers. I think 100 head of cattle, and their increase, would sustain a family. Twenty-five or thirty acres of these lands will sustain a beef, so each settler should have a pastoral homestead of about 3,000 acres, and use of the land by his cattle should be considered occupancy. I think, in the present, herds of cattle and sheep consists the mineral wealth of this section, and whatever laws are passed that interest should be first considered and protected. This question of grazing titles should be settled at once. Possession of distinct and well-defined ranges will result in contentment and permanency. We have to have summer and winter ranges and put up hay for cattle.

The timber lands should be surveyed and sold in unlimited quantities. They are annually ravaged by fires, which destroy ten times what the people use. The entire subject of timber lands, as well as other lands, should be turned over to the United States district land officers. I would grade the price per acre both as to quantity and quality. Private ownership best protects property in this country.

I am acquainted with the present system of land surveys, and think it should be improved and retained. Stakes at corners should be more permanently established.

We need population, and the pastoral homestead will aid us to acquire it. We do business with most all the people in this district, and I know that they want these land matters settled at once.

This arid region never can have the same condition as the humid regions, and people must live in communities for school and other purposes.

APPENDIX B.

OPEN LETTER OF R. W. RAYMOND RELATIVE TO MINERAL LANDS.

[Published in the Engineering and Mining Journal serially, from November 22 to December 20, 1879.]

GENTLEMEN: I have the honor to acknowledge the receipt of your circular containing a list of questions with reference to agriculture, timber, and lode and placer mining claims: to such of which as may be within the range of my personal information answers are desired. I am in receipt also of your complimentary special invitation to state any general views upon the subject of the mining law, with which my professional experience and my former official position as United States Commissioner of Mining Statistics have made me somewhat familiar. Regretting that the pressure of business prevents me from preparing in response to such a call a full discussion of the problems involved in your inquiry, I feel, nevertheless, that, as a citizen deeply interested in the success of your labors, I am bound to do what I can in furtherance of them, and I beg leave, therefore, to submit the following statements and suggestions with reference to a part of the subjects now claiming your attention.

The principle of the right of the sovereign to the ownership or control of any of the minerals in the earth, apart from proprietorship of the land itself, is not recognized by our laws. The government, like any private proprietor, possesses the surface of its lands, together with all that lies beneath them, to the center of the globe. There is no distinction in this respect between the base and the precious metals, or between the Atlantic and the Pacific slopes, or between the areas acquired by the United States from individual States and those obtained by treaties with foreign nations or Indian tribes. So far as I am aware, the government owns the minerals when it owns the land, and not otherwise.

The mineral right, however, although it accompanies the surface ownership, is separable by the act of the owner. A farmer in New Jersey may lease or sell the right to mine and carry away all the iron ore in his farm, with the privileges of entry and use of the surface necessary to mining operations, retaining his title in all other respects unimpaired; or he may thus dispose of the right to a single bed or vein of ore, retaining all others. A farmer in Pennsylvania may in like manner lease or sell all his "coal rights," or the right to one or more specified seams of coal, reserving to himself, undiminished, whatever is not thus transferred. A party owning two adjacent farms may grant the mineral right to a given deposit of coal, ore, or other mineral upon one of them, with the right to follow and mine in the other that deposit only. All these and many varieties of grants actually occur in our Eastern States; and the rights thus conferred, as defined by the agreements creating them, are independent of surface ownership, although in their origin they rest upon the principle that the owner of the surface owns also the minerals beneath it.

The government occupies precisely this position towards the public domain. It can do what it likes with its own. There is no "miners' right," created by the discovery of valuable mineral in any part of that domain, except what the government chooses to create by its own voluntary acts. By such acts it is bound, as an individual would be, neither more nor less. It is as free as any individual would be to dispose, as it may see fit, of any rights not already conveyed away; to change its policy at any time; to lease or sell on new conditions, or to decline to lease or sell at all. This elementary statement seems to be required to correct a popular impression that the principles of the law of mines are different in different parts of our country, and that there is some mysterious obstacle in this difference to the introduction of a uniform system. The fact is, that the owner of a gold mine in Georgia might, if he chose, sell his mine on the terms prescribed by the government to purchasers of gold mines in Montana; and the government might, if it chose, by a change in the statute, alter its terms in Montana to conform to the present usual practice in Georgia.

The course of Federal legislation in this respect has been dictated by policy. Its object has been to encourage the development of the mineral resources of the public lands, and to transfer the ownership of both land and mineral rights to individual citizens. That this course is wisest in itself, and best adapted to the spirit of our institutions, scarcely admits of question. The policy of administering the public lands as a means of producing revenue, through mines, timber, agriculture, or rents, is one which a highly centralized or despotic government may perhaps pursue; but certainly, it is not suited to Democratic or representative government; and even in monarchical states, it has not proved advantageous, as may be inferred from the general tendency

in all enlightened nations at the present day, toward the transfer of governmental enterprises to private hands. It may be questioned, perhaps, whether a system by which the government, as in Spain, Portugal, and Mexico, retains the ownership of mines, and leases them upon conditions involving their continuous working, is not calculated to secure a more active and steady mining industry than a system which, conferring individual ownership, permits mines to lie idle at the will of their owners. But I think no one can fail to perceive, upon thorough consideration, that the advantages of the Spanish system are delusive, and that its disadvantages, in the expense of administration and the inducements which it offers to the "robbing" of mines, are greater than its advantages, even if these were real. The tenant of a government mine will work it if it be profitable, of course. He would do the same, if he owned it. When it ceases to be profitable, he may continue operations for a while, rather than lose his lease. But there is no economic gain to the State in forcing its citizens to unremunerative labor. On the contrary, if a mine does not pay, it is best that it should be closed, while labor turns to more productive enterprise; and if a mine is to be closed it is far better that this should be done by an owner than by a tenant, for the owner may hope to resume operations under more favorable circumstances, while it is the interest of the tenant, whose abandonment of the property is final, to rob it of all accessible value and leave it in ruins. As for the revenue to be derived from renting mines, two things may be confidently asserted: First, if it were wise to burden the industry of mining with a tax not laid upon other forms of production, this could be done more effectively, conveniently, and equitably by a bullion tax; and secondly, it is not wise to do anything of the kind. I am aware that, a dozen years ago, while the bullion tax was collected by our government, I favored in my report to the Secretary of the Treasury its continuance in reduced measure, and its devotion to special purposes for the benefit of the mining industries. I will not pause here to explain in what particulars the circumstances and in what particulars my views have changed. It is quite sufficient at present to say that the obvious policy of the government is to treat mining like any other industry, and to administer the mineral lands, like the agricultural lands, with as little machinery and as little interference with private enterprise as possible.

We come, then, to this proposition—the United States is the holder, as the trustee of the people, of a vast area of mineral land. On the whole, it is best to sell this land as fast as possible, not looking for large revenue from its sale, but rather transferring it to private owners at prices that will repay the cost of the surveys and other necessary proceedings, and under conditions that will favor the exploration of its resources. To encourage mining, or at all events to lay no unnecessary burdens upon it, and to get rid of the unproductive property in mineral lands which cannot under our system be made productive by the government—these are the objects to be attained by Federal legislation.

In selling the mineral lands should the government make any distinctions as to price? It would have a perfect right to do so; and it seems at first glance a wrong to the people that public property worth many millions of dollars should be given away to those who have no other claim than that of discovery. This point deserves careful consideration. There are three ways in which the government might derive pecuniary benefit from the developed value of the mines on the public domain. It might provide for an estimate of value by its own officers, and a price based on such an estimate. It might sell the mining locations at public auction, thus leaving the estimate of value to competing purchasers. Or, it might reserve a certain percentage of the gross or the net product of a mine—an unassessable interest in the property—which, in case of a large and profitable development, would amount to a considerable sum. These three alternatives cover substantially all that could be done in this direction, apart from the actual retention of ownership by the government, and the collection of mine-rents.

As to the first of these, it is evident that in most cases no government officer could possibly make a just estimate of the value of a mine, before it had been worked; and no intending purchaser would spend money in developing it, without knowing at what price he could buy it; nor would it be for the interest of any intending purchaser to develop the real value of the property and thereby enhance its price.

The sale of locations at auction is open to similar objections. Nobody will explore and develop a piece of mining ground, with the knowledge that every proof of value which he may expose will make its acquisition more costly and more doubtful. But if such sales are to be held without previous exploration of the claims, then the chances are that the prices to be obtained by this method will not exceed the ordinary rates sufficiently to pay for the extra trouble and cost of administration.

The third alternative—the reservation of a proportion of the proceeds of a mine—would prove in practice, I think, difficult, odious, and unremunerative. It would be really a special tax. If levied upon gross production, it would bear severely on struggling enterprises. If levied upon profits, it would involve an inquisition into private business, a premium on deceit and concealment, and a vast amount of official labor for

comparatively small return. It would be like the revenue tax on spirits in difficulty of enforcement, but not in resulting revenue.

We may conclude, then, that the true policy of the government is to sell the mineral lands outright at uniform prices and with as little trouble and cost to itself and the purchaser as possible, seeking its profit, not in the direct proceeds of sale, but in the rapid development of natural resources and the establishment of prosperous communities.

It remains to be considered whether the present system of Federal mining law, as construed by the courts and administered by the General Land Office, effectively executes this policy; whether it needs reform; and, if so, whether that reform should be of the nature of moderate amendment or radical change. In the discussion of these questions, I shall strive rather to present an impartial statement of both sides than to advocate a definite scheme. No scheme suggested by individual study or experience can claim to be the best under the circumstances; because it is of the very essence of the problem that the system adopted by the government shall be acceptable to the mining communities. The present arrangement, whatever may be its defects, has the positive recommendation that it will work, is working; that it is a growth, and, like all growths, possesses vitality, which mere symmetry without vitality cannot replace; that its evils are known, while those of a new system are unknown. Moreover, it is of the utmost importance that any proposed reform shall be practicable and acceptable, because its failure to be adopted and successfully executed would indefinitely delay, and perhaps defeat, all reform in this department.

The declaration that the Government of the United States "owns the minerals when it owns the land, and not otherwise," might be deemed inexact as to Mexican land grants within our borders not yet confirmed by United States patent. Such grants, if they did not originally convey to the grantee the mining right, reserved that right to the sovereign; and upon the transfer of sovereignty to the United States this reserved ownership of the metals passed to our government, which thus became, in these instances, proprietor of the metals in the land otherwise owned by private parties. But the same leading cases in which this rule was laid down (chiefly the so-called Mariposa cases) contain the decision that a patent in confirmation of a Mexican grant is not restricted to the interest transferred by Mexico to its grantee, although such Mexican grant did not convey the precious metals. The practical application of this principle annuls the effect of the preceding one, and justifies the general statement that the right to metals in the soil, as a royal prerogative, is not incident to the sovereignty of the United States or of any single State.

The present system of Federal legislation originated in the tacit recognition of miners' customs, and has been gradually developed with perpetual, perhaps excessive, regard to those customs. Its general outlines are so generally known that I shall not burden this letter with a description of them. Still less can I attempt to discuss in detail its doubtful or ambiguous features, although some of these may receive attention in passing. I purpose rather on this occasion to consider directly the evils which seem to attend the operation of our present system, and the possible remedies for such evils.

Not all the complaints so loudly made deserve the attention or fall within the proper sphere of the government. People who engage in mining, on the public lands or elsewhere, have no special claim to be protected against the consequences of their own ignorance or over-eager credulity. The hazardous nature of the industry is good ground for rejecting the notion, once generally entertained, that special burdens should be laid upon it—that the mines, in some way not demanded of farms and factories and railroads, should "pay the national debt"—but it is not good ground for asking the government to furnish the technical knowledge required in mining, or to exercise supervision over mining operations. The general aid given to all the industries of the country by a scientific survey, and a complete statistical review of its resources and activities, is all that can be properly conceded; and this will never prevent the complaints of many adventurers who have suffered damage through the risks and difficulties peculiar to mining. The evils of "speculation," of which we hear so much, cannot be cured by legislation, if, indeed (as I do not believe), they are unmitigated evils, or if (as I do not believe) speculation could be repressed at all, without producing something worse. We may set aside, then, all those features inherent in the industry of mining itself, as matters which the government cannot mend, and with which it should not meddle.

Another set of embarrassments arises from the peculiar present conditions of mining in the public domain. The law-abiding instinct of our people is remarkable. The rudeness and violence often observed in our frontier communities cannot hide from the thoughtful observer the deeper fact that our institutions have bred in the masses a notable capacity for self-government. The very first step in a new mining district is the making of laws; and the degree to which such laws have been respected and enforce by public sentiment is a significant testimony in behalf of democracy. But this state of affairs, though infinitely better than barbarism, and certain, as experience has

shown, to pass by peaceful gradations into the complete, lawful organization of society, necessarily involves much initial confusion, bearing the germs of future trouble. The fundamental right of property fails of adequate definition among a host of pioneers, settling suddenly, like a swarm of bees, in the trackless wilderness. The entrance upon the public lands of population in advance of official surveys, is the most prolific source of embarrassment arising out of the present conditions of mining in those regions. Nearly all the other evils of this class will cure themselves faster than Congress could cure them. This one, however, needs, in my judgment, a special remedy. It will not cure itself under the present system of land surveys. A system is imperatively called for, which will permit the surveys to keep pace with the pioneers. The exact determination of points of reference all over the country, to which local surveys could be referred, and the abandonment of the futile attempt to lay out our whole national area like a checkerboard, with meridians and parallels, would, I think, be a wise and feasible measure, so far as the mineral lands are concerned. Of the agricultural land system I am not qualified to speak; but it seems plain enough that the reform required for the mountain lands, which mostly contain the mines, would be required also for the valleys inextricably intercalated among them, and occupied with mill-sites and ranches.

I conclude, then, with regard to the evils inherent, not in the nature of the mining industry, but in its present conditions in the West, that they are either (1) such as may be left to cure themselves, or (2) such as the local governments of States, Territories, and municipal subdivisions should deal with, as they deal with other matters affecting public peace and the enforcement of contracts; or (3) such as the Federal Government, the owner of the public domain, may measurably remedy by a more nearly adequate provision for the reception of settlers, and the adjustment of their initial relations to the land.

We now come to a class of evils inherited from the earlier (and, to some extent, still continuing) local customs. In my official reports (particularly the first, transmitted to Congress in 1869), to which, for brevity's sake, I beg to refer, without further citation, I have discussed at some length the absurdity of permitting the title to mineral lands to rest upon the shifting and untrustworthy basis of an irregular, periodical *plébiscite*, the edicts of which are carried out by irresponsible officials, and the records of which often may be, and often have been, exposed, without efficient guardianship, to loss, destruction, mutilation, or falsification. It has repeatedly happened that the disputed possessory title to valuable mining property has turned upon the memory or honesty of contradictory witnesses, concerning records which could not be found, landmarks which had disappeared, "customs" which had been repeatedly amended, repealed, and forgotten, and acts performed pursuant to or in violation of such customs by persons who had long since left the district or the world. Even if all mining recorders were sworn officers; if all their records were properly kept and guarded; if the local regulations were carefully prepared, not liable to sudden change, and permanently preserved for reference, there would still be great confusion arising from the lack of uniformity in the methods of acquiring and maintaining title. Something has been done, as I shall hereafter show, to remove the evils inherited from the miners' "customs." What remains to be done is to abolish altogether the irregular and whimsical subdivisions known as "mining districts," with all their officers, and to make all mining titles on the public lands originate in entries duly attested and preserved in duplicate or triplicate by the regular officers of the United States. Once, this would have been difficult and expensive; but I think the time has come when it can be thoroughly done, and will meet with the approval of the mining communities themselves.

Should the Federal Government attempt to replace all local regulations with a complete mining code? The answer to this question depends largely upon the meaning of the terms employed. It is evident that in all points within the sphere of State governments, legislation should be left to them; and, by analogy, though not with the same force, we may conclude that similar freedom should be accorded to territorial legislatures. According to the principles already laid down, the United States is simply the owner of certain lands, the development and sale of which it desires to promote. It is the business of the local governments to look after the peace and general welfare of the inhabitants; even considerations of political economy, such as the prevention of irreparable waste, would not justify the Federal authority in doing more than to look after its own property. Consequently, it seems to me, nothing should be done by Congress to establish mining regulations apart from such measures as are required to encourage the exploration and purchase of the public mineral lands, and (as incident to this end) to convey to the purchaser definite and secure title.

It may seem desirable, on the whole, that the size of mining claims should be made uniform by law over all the public domain. The present law fixes the maximum length and a maximum and minimum width; but within these limits any size may be fixed by local "custom" or rule; and the liberality of such "custom" is apt to depend upon the number of miners to the acre present when the "custom" is ordained. It must be remembered that the practice of fixing these dimensions by votes of the inhabit-

ants grew up at a time when they involved only the use of the surface for mining purposes, such as dumps, machinery, buildings, &c., and not such an absolute ownership thereof as rendered any intrusion by others an act of trespass. The miner was not limited by his surface in his underground operations; nor did his prior surface right hinder in any way the explorations of other prospectors, or their working of other veins within the space covered by his claim. Hence, very narrow surface claims were adequate appendages to very large mines.

In any attempt to sell its mineral lands, the policy, as well as the clear right, of the United States seems to be to divide the property into parcels of such size as will be at once most convenient to itself and most attractive to the buyer. Under the present law, however, there is no great practical difficulty in consolidating claims so as to obtain a sufficient portion of the main lode, which is the object of the purchase. Moreover, the State and Territorial legislatures have done much, and in many cases have done it admirably, to supersede with definite codes the previous local regulations of the districts. I am inclined to think that the size of claims, *under the present system*, may be left to them, within the limits fixed by the Federal law. If the present law is not changed in any other particular, I do not think it need be changed in this, except so far as to provide for certain cases in which the actual width of a vein at the surface is greater than the width of the claim. This point may be better discussed under a subsequent head.

Passing from the evils inherited from the mining customs, we come to consider such as are the legacy of former Federal legislation. The acts of Congress intended to correct the causes of complaint arising under the absence of all uniform law have entailed upon us some unnecessary complications, which have been further aggravated by conflicting decisions of the Land Office and the courts. The Supreme Court has brought order out of chaos in a number of cases which have reached it; but many moot points remain, and will, perhaps, never be settled, before the necessity of considering them shall have passed away entirely. I refer now to those difficulties only which arise from the features of our earlier laws (principally that of 1866), repealed or amended by later acts with reservation of all vested rights. The law of 1866 has been held in some cases to convey to the patentee under it no real ownership of the surface, but to give him, nevertheless, underground rights which the act of 1872 does not confer. This doctrine was partly overthrown by the decision in the "Eureka case" in 1877; but a recent decision in Utah shows that some courts, at least, hold that, among the vested rights of a locator prior to 1872, the right to follow his vein *on the course* into the ground of a prior locator is included, and cannot be destroyed even by the patent of the United States granted (prior to 1872) to the prior locator. It is claimed also that parties locating under the act of 1866, though they did not apply for patent until after the passage of the act of 1872, had a "vested right" to obtain, under the latter acts, a patent comprising all the privileges granted to patentees under either act. I have elsewhere argued, at length, the unsoundness of these and similar contentions. I mention them here simply to show the nature of the complications inflicted upon us by past legislation.

I do not see that legislation is required to remedy this state of things. The number of mining claims located before 1866, held by uninterrupted possessory title ever since, but not made subjects of patents, is not large enough to require a general measure; and the troublesome questions of so-called "vested rights," accruing under the earlier statute will best be settled judicially.

This brings us to consider briefly the evils developed in the administration of the present law. There is cause for complaint in the expense of proceedings attendant upon the procurement of surveys and the perfecting of titles. Your inquiries in the mining districts will have shown you that these expenses are not only onerous, but exceedingly irregular, being much greater in some districts than in others. As the true policy of the government is to sell its mineral lands, no unnecessary obstacles in the way of costly proceedings should be interposed. And this point is particularly reasonable in view of the fact that the surveyors who charge whatever they can get for their services have in many cases proved to be somewhat careless workmen; so that there is reason to complain of defective, as well as expensive, preliminary work. Changes in the machinery of the law, whether its general principles are changed or not, will be required to remedy such evils. The multiplicity of officials may be reduced; their duties may be redistributed; and they may be paid by the government, and bound to pay over to the government all their legally-determined fees. The result should be a saving to the people and no loss to the public treasury.

We have considered briefly the inherent, the inherited, and the administrative evils of our Federal system of mining law. We now take up, in conclusion, a fourth class of evils attendant upon that system, namely, those which flow from the main features of the sections of the Revised Statutes constituting our only national mining code, and which require, as a remedy, important changes in the law, not mere reforms of administrative detail, such as have been alluded to under foregoing heads of this discussion.

I repeat the declaration already made as a starting-point, that the true policy and

avowed purpose of the government is to sell its mineral lands on such terms as will promote their exploitation. Whatever may be the alternatives to which we are now shut up, we had, in the beginning, the possible course of renting the mines, or in other ways getting a revenue from them. I have already expressed my views on this point, and it may, therefore, be passed without further comment. Assuming, however, that the mineral lands should be definitely disposed of, the government might have, secondly, transferred them to the States as fast as these were organized and admitted, or, thirdly, sold them in large quantities to private persons or corporations. In either case, the expense of surveying and selling in detail would have been saved. But the public advantages sought by the system actually adopted could not have been attained under any plan which permitted a monopoly of the lands, or the growth of conflicting rules in different localities as to the exploration and acquisition of mineral property by individuals. It may fairly be maintained that the retention of the mineral lands by the general government, with a view to their sale under uniform laws, to *bona-fide* miners or mining corporations, was, under the circumstances, wise.

But the law, as it stands, fails to secure fully the objects for which it was designed. What it should do, to secure those objects, is to encourage prospecting merely as a preliminary to purchase; to hold out inducements, or even apply pressure, which will lead the "possessory owner" or temporary occupant of a mining claim to become, as soon as practicable, its purchaser; and to give to each purchaser a definite and secure title, as a protection to him, on the one hand, and to the intending purchaser of a neighboring claim on the other. In all these points, the law is more or less defective; and its defects may be classed under two heads. Those which spring from the right to follow a lode in depth outside the side lines of the surface claim constitute the first class; and their consideration involves the question, whether it would be wise and practicable to cease granting this right, and limit by vertical planes drawn through the side-lines as well as the end lines of surface claims the ownership of mines patented hereafter. The defects which may be remedied without this fundamental change in the law constitute another class; and of these I purpose to treat first, concluding my survey of the subject with a consideration of the so-called "side-line question."

Assuming that the right of the mine owner to follow and exploit his lode in depth between the projected end lines of his claim and beyond its side lines should be retained, the present law is still radically defective in several particulars. The theory of it is that, as a preliminary to purchase, the citizen may freely occupy and explore any portion of the public mineral lands not already occupied. This possessory title must be maintained by the performance of a certain amount of work annually. The amount fixed by the law is not enough to secure a real development of the mine; but it is enough to discourage the practice, once common, of the holding of many claims by one adventurer, to the exclusion of those who would gladly work them, and it furnishes a good legal test of the otherwise indefinite act of abandonment. I doubt whether this feature could be changed with advantage. But the present law, by conferring upon the possessory occupant rights as extensive as those of a patentee, and by permitting the possessory title to remain undisturbed and invulnerable for an unlimited period, offers too little inducement to the locator to apply for a patent. Indeed, in a large number of instances, the inducement is the other way. Not only the expense of the proceedings for patent, and the chance of suffering local taxation, as owner of land, to which the mere squatter upon government land would not be subject, operate to the advantage of the mere locator and the disadvantage of the patentee; but the application for a patent involves the precipitation of all pending contests as to title. Adverse claimants must then speak, or forever after hold their peace. The result is, that locators often delay applying for patent, in order not to arouse opposition which they hope to wear out in time; and disputes are thus nursed along, instead of being brought to an issue, and definitely ended.

It seems that only two strong inducements to take a patent arise under this law. If a possessory holder wishes to be able to abandon his mine for a while, without losing it, he must get a patent. If he wishes to sell it to a distant capitalist, or to a stock company, he must usually get a patent, because such buyers usually (and always should) insist upon this security against adverse claims. Unless these contingencies arise, there seems to be no special reason for taking patent.

In my judgment, the law should limit the period of possessory ownership; should not authorize the working of lodes in depth outside the side lines of locations until after the patent has been applied for (even though, as now, that right be granted by the patent); and should render the holder of a possessory title only incapable of enforcing an ejectment against parties working on his lode beyond his side lines, or of collecting damages, after he has applied for a patent, for ore so extracted by others before he made such application—under which term, in the present connection, I mean to include all the steps required of the applicant for the proof of his claim.

It may be said that, under such a law, locators might still go on indefinitely, by the simple expedient of repeated relocation. I admit the force of this objection; and I do

not think a prohibition of such relocation by the same parties would be very effectual, since it would be easy for them to evade it by employing others to make the record. But I apprehend that the consideration of the loss of priority in title by relocation would be a powerful objection to the course; and, at all events, it may be safely asserted that the inducements to apply for patents would be stronger than they now are.

I would mention, in passing, the limitation of the right of purchase to citizens as a feature of the law which serves only to annoy foreign purchasers, without preventing them from really holding mines. A citizen may convey his patent "to any person whatever"; and this being the case, why not let "any person whatever" buy the mine and get the patent? As it is, foreign corporations manage to control our mines, if they choose; and our citizens are never weary of inviting foreign capital to do so.

The law as it now stands, and as it has been in some cases at least construed by the courts, operates to the discouragement of the most enterprising kind of explorations, namely, explorations by shafts or tunnels. Section 2323 of the Revised Statutes says that the owners of a tunnel "shall have the right of possession of all veins or lodes within three thousand feet from the face of such tunnel on the line thereof, not previously known to exist, discovered in such tunnel, to the same extent as if discovered from the surface." In this grant, I believe the words "on the line thereof" have been so construed by the Land Office as to exclude veins crossing the tunnel, and thus to reduce the section almost to a nullity; but even setting aside this construction, the phrase "to the same extent as if discovered from the surface" is enough to destroy all tunnel claims. For it is held that the discoverer of a vein "from the surface" can acquire no title, not even a possessory one, unless he finds its outcrop, and locates his claim to include that. If I remember correctly, the Land Office has refused to grant a patent for a vein discovered in a tunnel; and I confess that it is difficult to see how any other decision could have been made under the circumstances. A patent requires a surface location, and that location must include the outcrop or the "top or apex" of every vein for which the patent gives title.

The tunnel section might as well be repealed. It is worth nothing to anybody as it is now framed and interpreted. But I think it would be just to declare that the discoverer, in ground not already occupied, of a vein not previously known to exist, wherever and however he may discover it, by shaft or tunnel, at its outcrop or in depth, shall have the right to locate a claim covering the point of his discovery, and to obtain a patent entitling him to work that vein as if its outcrop were within his claim. I say this would be just; and it would encourage enterprise and promote the discovery of valuable deposits not otherwise likely to be exposed. But it would seriously complicate the relations of patentees and locators. Less effectual, but perhaps more practicable, would be a provision authorizing the record of an underground discovery of a new lode, and giving to the discoverer a certain time within which he may seek for the outcrop or apex of the lode, and, upon finding it, be entitled to locate upon it, with the date of his underground discovery. If the outcrop or apex, when found, should happen to be covered by a patent, that ought to take precedence; but a mere location of later date than the underground discovery ought to give way. The guiding principle here is to encourage prospecting as much as possible; but, above all, to encourage the taking of patents.

Another defect of the law, or its construction, is the vagueness of the title conveyed under it by a patent. There is nowhere in it any definition of the terms "deposits," "veins," "lodes," "ledges," "dips," "variations," "angles," "locations," "claims," &c., which are freely used. Some of them are merely tautological. Such phrases as "vein, lode, or ledge," "dips, variations, and angles," merely lead to hair-splitting constructions by puzzled jurists, who try to discover shades of meaning in what was probably nothing more than aimless rhetoric. The adoption of all the ordinary miner's terms without definition constitutes one of the most troublesome elements of the bondage to local customs which has fettered our legislation. Even if Congress should declare the mining law to be independent of such customs, the declaration would be futile so long as the customs must be appealed to for the interpretation of the law. The meaning of the terms "vein," "lode," and "ledge," for instance, although much clarified by judicial decisions, is still subject to doubt. In a recent case in Colorado (which I cite, not to assail the ruling, but to illustrate this point), it was held that a "contact bed," or deposit, admitted to be legally a vein, did not begin to be a vein at its outcrop, because that was barren of precious metal, but did begin to be a vein, or in other words had its true outcrop or apex, at the point where it first showed by assay "an ounce or more per ton" of silver.

Now, any law or construction of law which makes the miner's title dependent upon subtle geological or chemical distinctions is unfortunate. As far as practicable, the statute should be so worded as to avoid such contingencies.

Another serious embarrassment of a similar nature arises from the construction which has been put upon the phrase of section 2322, "the top or apex of which lies inside of such surface lines extended downward vertically." Under this clause it has been held that unless a locator includes within the width of his claim the whole width

of the outcrop or apex of a lode, he cannot acquire the right to follow that lode beyond his side lines. This ruling has been applied in cases in which the local laws actually forbade the locator to make a claim wide enough to include the lode. It is easy to see that in such a case two or more locations may be made side by side on the same lode, and neither of the locators possess the right to follow it in depth. The remedy appears to be to consider the prior locator or patentee as entitled to the lode, and a slight change in the statute would put this beyond doubt; or else the provisions of section 2320 might be so modified as to forbid the limitation of width in mining claims by local regulation to a less width than that of the vein itself at the surface; or parties holding locations side by side, comprising the outcrop, which neither of them singly covers, might be allowed to consolidate their claims and thereby acquire a right which, under the present construction of the law, I suppose they could not acquire by consolidation, since they do not severally possess it beforehand.

But all these and many more ambiguities and uncertainties arising under the present law have their ultimate origin in the attempt to encourage the purchase and development of mineral lands by granting to the locator and patentee something more and at the same time something less than the contents of his claim, according to the ordinary common-law practice. Strictly speaking, the present system is, as I have shown, equally in accordance with the common law. But the ordinary common-law practice is that the boundaries of the mining rights are the vertical planes drawn through the boundaries of the surface tract. The convenience of this practice is attested by its universality. Land goes from hand to hand in parcels, and even when the mining rights have been alienated the unit of land measurement naturally remains the unit of measurement for the mining right. Our mining law involves endless trouble in its attempt to combine two units, the surface and the lode. Before the law was enacted the miners had but one unit, namely, the lode. Surface ownership there was none, only an easement or privilege of using the surface when necessary for mining operations. It may be questioned whether the present system is an improvement.

In the report which I had the honor, as United States Commissioner of Mining Statistics, to present to the Secretary of the Treasury, January 18, 1869, and in which the subject of the mining law was discussed, I used the following language:

"The Spanish and English laws, as I have shown, invariably bound mining claims by vertical, just as the property of land-owners is bounded. The modern Prussian law does the same thing. But, according to the present codes of other German states, and the ancient codes of all, inclined locations may be granted, with the right to follow the vein in depth, without reference to the surface ownership. The American miners' law is unlike either, and, so far as I know, has no parallel in history. It comprehends the vein, its dips, spurs, and angles, to any depth; and under this provision, when two veins are found to meet in depth, the oldest location is held to be the main lode, and the other is confiscated as a 'spur.' (The word 'spur' is omitted from the United States law of 1866; but the sweeping recognition in that law of 'mining customs' virtually restores it.) There is no justice in such a provision. On the other hand, there is no limit in American local regulations as to the distance between parallel locations, which, no matter how closely they lie together, are presumed to be on different veins until proved to be on the same. This state of things both invites and protracts a litigation which is seldom settled except by exhaustion and compromise.

"There are not wanting those who urge the adoption of 'square locations' exclusively as the cure for these evils. But with such, after mature reflection, I cannot agree. The great aim of the government, in disposing of its mines should be to secure their permanent and systematic working. To define the boundaries of mining ground by vertical planes does indeed lessen the danger of litigation; but it also lessens the value of the claim; and, in most cases, the value thus subtracted from one property is not added to any other. Thus, a miner under the Spanish law loses the right to work his vein because, at the depth of 600 feet it passes out of his surface boundaries into the neighboring claim; but the neighbor is not much better off for knowing that 600 feet below the surface he may find a vein of ore. To the miner who has already reached that depth it is valuable; to the miner who must dig and blast 600 feet to find it, it may be worth nothing. Meanwhile it is undoubtedly for the interest of the country that the work should be continued in depth; and the proper person to carry it on is evidently the one who has commenced it and prosecuted it thus far. * * * For the present stage of mining in this country, as for the earlier stages of mining in Germany, the inclined location must be accepted as the best for lodes."

My later reports and publications show a more decided recognition of the advantages of vertical boundary planes, now almost universal among civilized nations. But they also repeat the one consideration, which seemed to me decisive, ten years ago, against that system, and which still constitutes the chief objection to it. I mean the encouragement to deep mining held out by the present system, or, rather, the encouragement to the investment of capital in mining, constitutes in the knowledge that the valuable mineral deposit may be followed indefinitely in depth. Can that advantage be in any way secured under a system of vertical boundaries?

I shall waste no time in vindicating personal consistency in this matter. It might be shown that ten years have changed the conditions of mining in this country and the features of the mining law more than they have changed the views embodied in the long argument from which I have quoted. Our mining districts are better known; it is more easily practicable to measure and define the surface-unit at the beginning of operations; the vague rights granted by miners' custom have been largely shorn and restricted by definition. Above all, the present requirement that the survey of a claim shall not be changed after first location, except by relocation (sacrificing prior date of title), and that it shall convey only that portion of the mineral deposit of which it contains the outcrop, top, or apex, utterly revolutionizes the spirit of the former system, and reduces to a slender remainder the "rights of the discoverer." It is no longer possible for a citizen discovering valuable mineral in place to claim it by virtue of priority alone for an indefinite period. He must make haste to find its top or apex or outcrop before any one else; then he must make haste to locate a claim including that upper edge; and by that location, however wisely or unwisely made, he must abide through all subsequent proceedings for title. The certainty of a location carrying absolute ownership of a tract and its contents would be in many cases far better for the miner than this combination of the chance of getting a great deal with the risk of getting nothing.

But assuming that a change could be effected in the present administration of the statute, or in the statute itself, by which more freedom should be given to the locator, or assuming that, in the majority of cases, the discoverer actually finds and successfully locates upon the outcrop of his deposit, then there is certainly a real encouragement for him in the knowledge that he can follow the deposit in depth. Can this be secured under a system of vertical side boundaries?

Two expedients only are suggested. The first is to vary the size of the claim, as the Spanish law does, according to the dip of the deposit. This is open to the gravest objections. It delays the definition of the surface claim (to the manifest injury of neighboring explorers) until the mine has attained a certain depth. The Spanish law makes this depth ten yards, and the dip of the deposit for the first ten yards is taken as the basis for determining the width of the claim (which, however, never exceeds 200 yards on either side of the outcrop). It may fairly be said that this offers little security to the locator. The uppermost thirty feet of a vein are, perhaps, more likely than any other part of it to show a false, local dip. Yet it would not be practicable to require a greater depth, and hence a greater delay, before settling the boundaries of the surface claim.

But if we cannot well vary the size of the claim according to the features of the deposit, the only other expedient is the granting of a tract sufficiently large to offer as great encouragement to miners as is now offered by the peculiarity of the underground ownership. In my report, above quoted, I mentioned 40 acres as the size of the "square location," which would in many districts be necessary to effect this purpose. But that statement needs explanation and qualification. Let us first assume that the location is square in form. The tract of 40 acres is then 1,320 feet square. If the outcrop of a vein runs along one side of it, dipping into the tract—the most favorable case for the locator—the location commands 1,320 feet of the strike, and a distance on the dip indefinitely great as the position of the vein approaches the vertical, and diminishing as it approaches the horizontal, toward a minimum of 1,320 feet. Assuming, as an average case, the dip of 45°, the depth of vein within the tract would be about 1,867 feet, and the vertical depth at the point where it leaves the tract 1,320 feet.

For many reasons, however, it is not to be supposed that square claims would be generally, or even frequently, so located as to carry the outcrop along one side. Assuming, then, as an average case that the location, of the form and size now under discussion, carries the outcrop through the center, and parallel with two of its sides, we have for a dip of 45° a distance on the dip, within the location, of 933 feet. This is not too much, if a single vein is taken into consideration; and if a mining district is to be surveyed according to the present land-surveying system, with the square mile as a basis, and meridians and parallels as the boundaries, and if such survey is to be independent of the course of the mineral deposits, and the mining locator or purchaser is to be obliged to choose his location among the squares thus defined, I think the square of 1,320 feet, or $\frac{1}{16}$ of a square mile, is at once the most convenient and the smallest which can reasonably be fixed as the size of a claim.

But I thought in 1869, and I think still, that the area of forty acres is too great to be accepted by the mining communities, and that the attempt to introduce it would cause much trouble, particularly in districts where several parallel veins might cross such a tract. But few prospectors (sixteen to a square mile) could get a foothold under such a system, and those few would occupy at the outset all the valuable mining ground. Prospecting would be discouraged, and the motive which supplies our new mining camps with the population absolutely necessary for a supply of labor, the establishment of communications, &c., would be almost destroyed.

Hence, I think the attempt to lay out the mineral land in fixed squares would not

be wise. If the claims were permitted to have, on the other hand, any form and position, a minimum width (or, better, a maximum length) and maximum area being prescribed, one-half the area of 40 acres would suffice to secure substantially equal advantages to the miner; and this is the size which I venture to recommend.

Judge Hallett, of Colorado, in an able review of this subject, addressed to your honorable commission, advocates the absence of restrictions as to form and position of locations, fixing the size as not exceeding ten acres, in any form not less than 100 feet wide at any point. This would permit a maximum length of 4,356 feet; and cases might easily arise in which this length would be located. Given, for instance, a well-defined vein or bed, easily worked near the outcrop, and yielding above water level oxidized ores reducible cheaply, say, by amalgamation, it would be the interest of a locator to take up 4,356 feet by 100 feet along such a vein, with the intention of robbing its upper portion by an open cut, and then abandoning it. To encourage this would be to discourage systematic and permanent mining. Hence it would, in my judgment, be preferable to fix no minimum width, but a maximum length of location in any direction of 1,500 feet. This length would permit, for the area of 10 acres, a width of about 290 feet, which is, in my judgment, not enough. For the area of 20 acres, the width for the maximum length might be 579 feet, which is sufficient to encourage permanent mining. It is true that many, perhaps most, deep mines would extend beyond such a width. For the average case we have been considering, of a vein running through the center of the claim and dipping 45°, this width would give but 410 feet of mining depth; but it may safely be presumed, as Judge Hallett remarks in a letter to the Denver Tribune, that this point will be met by "the ability and disposition of capitalists to gather up a sufficient area for deep mining where the existence of valuable ore may be shown." In other words, a capitalist will buy the neighboring claim if he needs it. Judge Hallett, however, uses this argument in favor of the ten-acre claim. I submit that such a claim is too small to secure the necessary deep mining to satisfy the mine-owner of the permanence and value of the deposit; while, on the other hand, if a rich and valuable vein passes out of a claim of 1,500 by 290 feet, it is likely to enter the adjoining claim at so small a depth below the surface as to invite the owner of that claim to work it himself, or hold it at an exorbitant price. Judge Hallett's proposed claim is less than one-half as large as the maximum now permitted by the United States law. The size which I suggest is nearly the same as the present maximum (1,500 by 600 feet).

In all the suggestions which I have heard on this subject, it seems to have been taken for granted that no location should be made until after the discovery within it of "valuable mineral." This phrase is vague enough, and the administration of the part of the law containing it is very likely to be a farce. If the condition could be removed without detriment to the public interest, the whole problem would be greatly simplified. So far as the government is concerned, it seems a simple proposition that if the government is willing to sell agricultural lands at $1.25 per acre, and mineral lands at $5 per acre, it would have no reason to object to sell the latter and take the money, leaving to the purchaser the risk of value. We do not ask the settler upon agricultural land to prove the fertility of the soil before we sell it to him. He pre-empts or buys at his own risk. We guard against monopoly of land, so far as we can, by limiting the size of the pre-emption claim. We can do the same thing to the same degree by limiting the size of the mining claim. In neither case can we prevent people who have the desire and the means from buying up farms, or land warrants, or mineral land patents, and then working upon the property or not as they see fit.

Under our present system, a patentee may allow his mining property to lie idle if he chooses. If he does so choose it is manifestly immaterial to the public whether there is really a mine there or not. But the locator, we ordain, must have found a valuable mineral deposit, and must bestow upon it, to maintain possessory title, a certain amount of work annually. The only reason that I can discover for this rule is the desire to prevent a mere locator from holding without developing a piece of ground in which, otherwise, some one else might find a valuable mine. If the miners were all owners under patents, we should, and safely could, leave the question of working or not working to their self-interest. Any mine that promised to be profitable would be worked or sold in the course of no very long time. The policy of the government, as I have explained, is to encourage prospecting as a preliminary to purchase; to induce prospectors and possessory owners, by every practicable means, to take patents, and to grant patents on terms so easy and for tracts so small as to favor the miner of limited capital. It seems to me that these ends might be secured by a simple system like the following:

Let mining locations be made anywhere on unoccupied public lands, whether any discovery of mineral has taken place or not. Fix the maximum area at 20 acres, and the maximum length at 1,500 feet. Allow the locator to occupy by possessory title for one year—adequate evidence of the boundaries of the location being maintained on the ground as well as in the record. Require a certain amount of work for each 100 feet in length of the location to be performed as a condition of relocation. At any time

during the year, if the locator applies for patent, sell him the tract. If he desires to continue to occupy by possessory title, require him to give notice to that effect, together with proof of the performance of the prescribed work, before the end of the year; and at the end of the year, *unless some other party has, at least sixty days before, made application to purchase*, issue to the locator the certificate of his possessory title for another year, on the same conditions. But if application to purchase has been made by some other party, and not by the locator, then the latter, during the last sixty days of the year, may elect whether he will purchase or vacate the claim. In case no such application has been made, and the locator has not appeared before the close of the year with his proof of work done, let the claim be open to relocation by others.

Under this system, the locator would occupy the position of a tenant, to whom the proprietor should say, "I will let you have this property for one year, with the option to buy it at any time at a nominal price. At the end of the year, if you have done a certain small amount of work on the property, I will let you have it for another year, unless a purchaser appears. In that case, I shall sell it—to you if you choose, or else to him. But if you neither buy nor improve the property, and no purchaser appears, I shall put somebody else in your place on the same terms as I offer you."

Thus we should get clear altogether of the mineral deposit or lode as a unit, and base all proceedings on the land. The officers of the government, from the register and surveyor to the judge, would be relieved from the duties of mining experts, and geologists, chemists, and mining captains would no longer be called upon as witnesses to settle by hair-splitting distinctions the right of property. If any radical change in our mining law can be successfully made at the present time, I believe this plan would be as practicable as any, and more beneficial than any, which have come to my notice. If this, or something like this, cannot be adopted, then it seems to me that it would be wiser to amend in detail our present law, rather than attempt changes which would be revolutionary without being remedial.

There are many points still needing discussion. Whether the lines of a location should be alterable by resurvey before application for patent (I would say, Yes; the rights of neighboring locators being respected); whether a prospector should have any rights prior to a regular survey and record of location (I would say, Yes; the right to stake off his claim provisionally, and to lose nothing by delay of the government officer in making official survey—all this under proper regulations); whether a prospector, simply roaming over the public land, and finding "mineral," should have any right by virtue of discovery (I would say, No; but his commencement to stake off or mark the boundaries of a claim should give him the inchoate right to that claim, to be perfected, however, by continuing and finishing the proceeding); whether one year, as I have suggested, is the proper term; whether sixty days, suggested in another place, is the proper term; whether possessory owners should be notified, by advertisement or otherwise, of applications to purchase, at the end of their term, the claims they are occupying; whether such notice should be given at the expense of the party acquiring the claim, or whether it is sufficient that these facts should be kept in accessible records, and the possessory owner obliged to consult the record thirty days (or some other fixed period) before the end of his year, to discover for himself whether there is a proposing purchaser; how far present possessory owners can be forced to take patents or to accept the terms of the new law (I fear nothing of this kind can be done so long as they obey the terms of the present law)—these and many other questions of detail arise; but I cannot see in any of them difficulties which would constitute insuperable objections to the proposed system, or which would justify me in prolonging further these communications, for the length and diffusiveness of which I ought rather to offer my apologies.

Yours respectfully,

R. W. RAYMOND.

APPENDIX C.

INFORMATION AND STATISTICS GIVEN BY MESSRS. HAGGIN & CARR RELATIVE TO IRRIGATING THE FARMS OWNED BY THEM IN KERN COUNTY, CALIFORNIA.

SAN FRANCISCO, CAL., *December* 3, 1879.

DEAR SIR: I send you to-day reports of several engineers in my employment who have been engaged in the work of reclamation. They will show for themselves. Also a tin case containing maps: Frist, a map of that portion of Kern County in which I am interested, embracing all the desert lands in that section and showing the various ditches; second, maps A, B, C, D, which are referred to in Fillebrown's report and are explained thereby. These are maps made from actual surveys, and are the various maps that the different members of your commission desired. In the Fillebrown map, showing the checks, he has only put down the checks between two of the ditches, omitting the balance, as the map is on so small a scale that the blue lines would be very numerous and very close together if carried out.

The reports are private reports and were not prepared for publication, but as I see no better way of giving to your board all the information it may desire, I send them to you to make such use of them as the board may deem proper.

Yours truly,

I. B. HAGGIN.

Hon. J. A. WILLIAMSON.
Commissioner General Land Office, Washington, D. C.

Report of T. R. Fillebrown, engineer of Irrigation District No. 4, dated November 25, 1879.

To Messrs. HAGGIN & CARR, *San Francisco:*

GENTLEMEN: In accordance with your instructions I herewith submit my report of work performed under my supervision during the past year for the irrigation of the dry lands north of Kern River and below the line of the Calloway Canal, known as District No. 4.

I.—CALLOWAY CANAL.

Cost to April 1, as per estimate returned (W. H. Broad's contract)		$61,595 72
Ranchero's wages and repairs for April, May, June, and July, as per check drawn in favor of E. M. Roberts, ranchero		523 25
Repairs by Fred. Stineman, removing temporary dams, clearing out obstructions, &c., as per amount placed to his credit on account of Belle View Ranch		165 60
Earthwork by teams belonging to Belle View Ranch, April 1 to date		2,680 57
Poso Creek Weir:		
Lumber, including freight and hauling	$928 60	
Carpenters and laborers, including board	580 75	
Pile-driving, including board of men	303 50	
Hardware and nails	289 98	
Blacksmithing	72 00	
		2,174 83
Engineering and superintendence		1,025,00
Total cost to date, not including amount paid to O. P. Calloway		68,164 97

NOTE.—In addition to the foregoing there is about $10,000 paid to Calloway for work that he had done before Mr. Higgins acquired the ditch.

Work is now in progress near the head of the canal, repairing and raising the banks, principally along the Kern River Slough, the cost of which, not having been determined, cannot be embodied in this report.

II.—BRANCH DITCHES COMPLETE TO DATE.

Ditches 20 feet wide, $6\frac{44}{80}$ miles; cost	$5,843 33
Ditches 16 feet wide, $50\frac{79}{80}$ miles; cost	35,179 78
Ditches 12 feet wide, $3\frac{32}{80}$ miles; cost	2,265 87
Ditches 8 feet wide, $3\frac{25}{80}$ miles; cost	1,869 83
Total length $64\frac{80}{80}$ miles; cost	45,158 81
Engineering and superintendence	4,300 00
Total cost, including head-gates and weirs	49,458 81
Average cost per mile	768 44
Add 20 side-gates per mile, at $12	240 00
Total cost per mile, including weirs and side-gates	1,008 44
The above ditches will irrigate 16,160 acres, making the cost of ditching per acre	4 00

III.—NUMBER OF ACRES CHECKED TO DATE.

Number of acres checked to date, ready for cultivation, including work done on Poso Ranch and by tenants	5,956	
Average cost per acre	$1 64	
Cost per acre for waste-gates	51	
Total cost of checking per acre		2 15
Total cost, ditching and checking per acre		6 15

The Calloway Canal is constructed 80 feet wide on the bottom, with banks 5 feet high and 4 feet wide on top, with inside slope of four to 1 and outside 2 to 1, from Kern River to Poso Creek, a distance of 30 miles, at which point the upper bank stops and connects with a levee extending up the banks of the creek to a point where the natural surface is as high as the top of the canal bank. A similar levee is built on the north bank of the creek, thus converting that portion of the creek into a pond or reservoir. In connection with the lower bank of the canal in the bed of the creek is placed a weir 150 feet in length, with wings at either end 20 feet long, extending into the banks.

A plan of this weir is herewith submitted, marked A, an examination of which will better enable you to understand the nature of the structure and the duties it is expected to perform. This weir is divided into 25 gates of 6 feet span each, from center to center of posts, so constructed as to be raised from the bottom by means of a chain passing round a windlass, which is turned by a movable iron lever. A bridge for horsemen is also provided on top of the weir.

By this means the water of Poso Creek is made available for irrigating the land north of the creek and for several miles south, the grade of the canal being so slight that the water from the creek may be backed up the canal for several miles.

In case of very high water, which may occur during some winter seasons, these gates may all be raised, allowing the water to pass down the creek in its usual channel. Should the canal and creek become partially filled with sand at their intersection, which is likely to occur, by raising the gates of the weir a few inches and allowing a small stream to pass through the sand will be readily sluiced out and carried down the stream.

This creek is entirely dry during a considerable portion of the year, but in most winter seasons carries quite a large volume of water for a short time, which water will be utilized in the manner above stated, and added to the available supply for irrigation of lands adjacent to the creek.

North of Poso Creek the canal is at present extended but three-fourths of a mile to accommodate the tenants who have leased land on that side. This portion is but 160 feet wide on the bottom, but is otherwise constructed the same as the other portion.

The canal has a grade of eight-tenths of a foot per mile, which gives it a theoretical capacity of 894.7 cubic feet per second to the end of the eighteenth mile, at which point it is reduced to four-tenths, and is constructed upon that grade to the terminus, the diminished grade admitting of the canal being run upon a little higher ground, thus bringing more land within the reach of irrigation, and at the same time not materially reducing the capacity of the canal, the taking out of each branch ditch having the effect of accelerating the flow, and at the same time diminishing the requirements of the canal by the amount discharged by such ditch.

These branches, with a few exceptions, have been constructed 16 feet wide on the bottom, with banks 3¼ feet high, intended for 3 feet of water, with slopes 3 to 1 and a grade of 1.6 feet per mile, giving to each a capacity of 196.5 cubic feet of water per second.

The ditches are provided, at intervals indicated by the fall of the land, with weirs by which the flow is regulated and by which means the water may be held in any section of the ditch until it rises if necessary to top of the bank and is forced out through side gates (which will be more fully mentioned hereafter) on to the adjacent land.

In adopting a grade for these branches I have not been guided by the quantity of water which might be required (a quantity very difficult to determine at present, for reasons which I will state further on), but have given them as rapid a grade as I thought the banks would stand without washing, judging from a limited experience upon this character of land.

The descent of these lands to the westward being from 12 to 20 feet per mile, all in excess of the grade of 1.6 feet per mile is overcome by drops, each weir having a vertical drop of from 1½ to 4 feet, depending upon the descent of the ground. Should the velocity be found so great at this grade as to cause washing of the banks, each weir furnishes ready means of diminishing the grade, and consequently the velocity to any required degree.

A plan of weir for 16-foot ditch, with 3-foot drop, is herewith submitted, marked B, and is made a part of this report.

Levees or checks have been and are being built, extending from the bank of one ditch to that of another, following the contour of the ground, each check being on ground 1 foot lower than the preceding one, and built 1¼ feet high, to make allowance for settling and yet hold the water until it rises to the base of the next higher check. Each check is provided with a waste-gate, and in some instances two, for draining the water off the ground above it on to that below when the former becomes sufficiently saturated. A side-gate in the bank of each ditch delivers water to the land above each check, thus giving to the tract of land between any two checks a supply of water from two ditches at the same time, besides the surplus water delivered through the waste-gate in the check above.

The accompanying diagram, on a scale of 5 chains to the inch, marked C, shows a section of the main canal, with a portion of two ditches, with weirs, gates, checks, &c., as actually constructed, and will render the system clear and easily understood. The same exhibit shows also a cross-section of the main canal and of a 16-foot ditch, also a profile showing a small portion on an enlarged scale, with water standing upon the ground.

Persons who have irrigated land by this system, upon a small scale, state the annual expense of distributing the water at from 10 to 25 cents per acre. I am of the opinion that when the levees are thoroughly settled and the plans properly carried out it will be brought within the smaller figure; admitting, however, that it may reach the maximum of 25 cents, it will still compare favorably with the system of small ditches in use elsewhere, where the annual expense of irrigation ranges from 75 cents to $1.50 per acre.

The map marked D (scale 40 chains per inch), herewith submited, showing the three townships in which this system is being carried out, together with the three adjoining townships on the west, gives the correct location of the main canal through these townships and all branches constructed to date, denoted by a full red line; also a small tract of about 350 acres of very uneven ground (mostly on sections 16 and 21, township 27, range 25) as it is checked; and also the last, or most westerly check, now constructed between each two ditches—the lines denoting checks being drawn in blue. I have also drawn on this map dotted lines, showing approximately the proposed extension of these ditches.

These last lines, of course, will be subject to many alterations upon a careful instrumental survey, but they will serve the purpose for which the are alone designed, namely, to give a general idea of the number and extent of ditches necessary to be constructed to irrigate all the arable lands which may and should be embraced in this one system of irrigation.

The ditches are located upon the highest ground, following the meanderings of the ridges wherever there is a material difference in elevation, but when the elevation to be gained by deviating from a straight line is slight and immaterial a straight line is of course preferable.

By a glance at this map, therefore, it will be seen that, desirable though it may be for convenience in the cultivation and harvesting of crops to construct ditches and levees straight, and upon or at least parallel to the section lines, such location would be incompatible, in most cases, with a thorough, practical, and economical irrigation of the land, and when it is understood that these levees are built with broad bases and consequently flat slopes, so that farming machinery may be easily driven over them, the difficulty in the way of working the land becomes, I think, more apparent than real.

In the location of branch ditches I have been annoyed in some few instances by being obliged to deviate from the proper line as indicated by the topography of the country to avoid trespassing upon the pre-emption, homestead, or other claim of some sheep-herder who has filed his claim upon 80 or 160 acres of land for the purpose of grazing the entire plain during the winter months, and whose claim invariably becomes very valuable, in his own estimation, as soon as it becomes known to him that it is in the way of the proper carrying out of any other enterprise.

To segregate these lands into small ranches of quarter, half, or whole sections, either for purposes of lease or sale, to be bounded and defined by exact section lines, will conflict more or less with the proper carrying out of this system, which system I believe to be for the lands of this character the most practical and economical which can be adopted.

Should it be found necessary or desirable to make leases or sales by sections or exact subdivisions of sections, it will be necessary to construct division levees upon the section lines, which will in some cases considerably increase the cost.

You will observe that in stating the cost per acre I have not included the item of proportionate part of cost of main canal. This it is impossible to arrive at with any degree of accuracy until it is more fully determined how many acres can and will be irrigated from this canal.

The number of acres in this district, between the canal and Goose Lake slough, is something over 200,000. To irrigate the entire district would, therefore, evidently necessitate a material enlargement of the canal, and, in all probability, an increased supply of water from the river. The acreage which will be irrigated, therefore, must depend mainly upon the extent to which these works are carried out, a question too broad in its scope to be more than alluded to in this connection.

Attention has frequently been called to the question of increasing the available water supply of Kern River to meet the growing demand of this valley by the construction of mountain reservoirs. This is a question of vast importance, and is worthy of more close and careful consideration than it has yet received from any one.

The work of construction under my charge has demanded my entire attention and prevented my making any personal examination of this subject. I have been informed, however, by persons familiar with the mountain region through which Kern River flows, and in whose judgment I have much confidence, that there are small valleys along its course which may be converted into reservoirs of almost unlimited capacity, at comparatively slight expense, by the construction of dams across the narrow cañon below. I can, of course, make no estimate of the cost of such works at present, having no data to work from, but call your attention to the matter again in order that the importance and ultimate necessity of such works may not be lost sight of. I am not advised to what extent the State engineer corps has investigated this question, but presume it has not wholly escaped their notice.

This land in this district in its present condition is very dry and porous, and will absorb a large quantity of water at the first irrigation, which quantity will gradually and very materially diminish with each succeeding irrigation. The fact that most of these lands have an underlying stratum of either hard-pan or clay, from 1 to 4 feet below the surface, gives some assurance that, after once thoroughly saturated, they will retain moisture longer, and therefore require less water than lands on Kern Island, or in most other portions of the San Joaquin Valley.

You will observe also that the ditches already constructed have the capacity for discharging several times the volume of water that the main canal will carry. It must be remembered, however, that these ditches will seldom, if ever, be run to their full capacity, that they will not all be running at the same time, and that the crops depending upon them when they are running will not all require to be irrigated at the same time. The banks have been built high, so that the water can, by means of the weirs, be held in any section of a ditch until it rises high enough to cover the highest ground adjacent to the ditch, upon which it is delivered through two or more side-gates; which side-gates are so placed as to deliver the water first to the highest ground between any two checks, so that the high ground becomes partially irrigated by the running of the water over it, thus lessening the time necessary to keep the lower portions flooded.

I have also had in view the ultimate deepening of the canal to a depth of 8 feet, according to your original intention, which has been very properly deferred, however, until such time as the further settlement and cultivation of the land shall call for a larger supply of water than its present dimensions will furnish.

Returning again to the lands now ready for cultivation in the district under consideration, I will state more fully relative to the rented lands. In 1877 you built five houses, barns, corrals, &c., in this district. These have been occupied since that time by thrifty farmers, raising crops of wheat, barley, and some oats. Some fruit-trees have also been started at most, if not all, of the places. These ranches are all irrigated from the Calloway Canal by means of small ditches and checks, but are not embraced in the tract upon which the general system of checks is being undertaken. Within

the last-named tract nothing was done in time for a crop last season, but work has been vigorously pushed forward for the last year, both upon the main canal and upon branch ditches and checks, preparatory to the coming winter's seeding.

You have built upon this tract during the past year, besides the buildings upon the Poso ranch, twelve houses, barns, &c., for the use of tenants. These houses are two stories high and 18 by 35 feet on the ground, with a porch or verandah above and below, the entire length of one side. The barns are 30 by 45 feet, containing a granary and stalls for 20 horses below and hay-loft above. Each ranch is also provided with a well-pump and horse-power. The depth to which wells have to be bored varies from 80 to 110 feet. The entire cost of house, barn, well, &c., for each ranch is about $2,000. The improvements on the Poso ranch (section 3, township 27, range 25 east) consist of a house and well the same as built for the tenants, barn 45 by 103 feet, with granaries and stall room for 40 animals, with the addition of sleeping quarters for men, kitchen, dining-room, and blacksmith shop, costing in the aggregate something over $4,000. An artesian well is now being bored here, and has reached a depth of about 250 feet. No trials have heretofore been made in this district for artesian water, but as flowing wells have been obtained on Kern Island, to the southward, and at Tipton, only 30 miles north, it is hoped and believed that the experiment being made here will prove a success.

These ranches are now occupied by farmers who came mostly from Tulare County, but some, I believe, from Stanislaus and Merced, where they had sown crops last year and lost them by reason of the drought. The branch ditches running to and through their ranches have been built by them under contract, you furnishing implements and paying them 5 cents per cubic yard of earth. This has given employment to their otherwise idle teams and men, and though the price will strike most earthwork-contractors as extremely low, the material being so light, dry, and easily moved, they have not only earned good wages for their men and teams, but have made a profit which has enabled them to purchase additional stock for carrying on their ranches. They have from 200 to 700 acres each now checked and ready for cultivation, the average being about 350 acres, while on the Poso Ranch your own force has checked a little over 1,700 acres. It is hoped that the present acreage of about 6,000 may be increased to 10,000 or more in time for seeding during the coming winter. The work of ditch construction has been partially suspended, the stock being needed to put in the crop on the various ranches. I have, however, 30 head of stock still necessarily engaged in hauling lumber and supplies, and between 60 and 70 men, including carpenters, laborers, and teamsters, engaged in putting in weirs and gates, my pay-roll at present amounting to about $120 per day.

From the above you will see that I cannot at present give you a final statement of the actual cost per acre, with a view to fixing a price at which these lands may be put upon the market; and I would suggest that your present system of leasing lands be continued until the works are carried far enough to determine this question more satisfactorily.

The tenants now occupying these lands pay you a rental of one-fourth the crop, you building the ditches and delivering the water to the land without cost to them, and advancing them the necessary supplies while preparing the ground and putting in their crops. If you can afford to continue these terms you will find no lack of tenants to cultivate your lands. It has in fact been intimated by some of your tenants that they, being men of small means, would rather and could better afford to lease lands upon these terms than to purchase it at the rate necessary to cover the expense of canals and ditches, with the liability of further expenses from time to time for keeping up repairs, enlarging and extending works as may become necessary in the future; while you, on the other hand, if you can afford to reclaim these lands at all, can better afford to retain the ownership until your plans are more fully developed than to dispose of a few small tracts, the separate ownership of which might impede such development by reason of a failure or refusal on the part of purchasers to co-operate with you.

Very respectfully submitted.

F. R. FILLEBROWN,
Engineer Fourth District.

POSO RANCH, *November* 25, 1879.

Report of C. Brower, agent, and Walter James, engineer, of Irrigation District No. 1, Kern Valley, dated November 25, 1879.

BAKERSFIELD, CAL., *November* 25, 1879.

Messrs. HAGGIN & CARR,
San Francisco, Cal.:

GENTLEMEN: In compliance with your request for information concerning the availability of the lands of this district, and the condition, cost, and progress of its works of irrigation, we have respectfully to submit the following report:

The district is bounded on the north by Kern River and the bluffs which skirt the

south bank of that stream; on the east by the east line of range 28 east, Mount Diablo base and meridian of the United States survey, along or near which line the usually level surface of the valley breaks into the undulations of the foot-hills of the Tehachapa Mountains; on the south by a line drawn east and west through the center of the basin known as Kern Lake; and on the west by that branch of Kern River known as "Old River," which leaves the former stream at a point near the center of section 26, in township 29 south, of range 27 east, and runs thence in a southwesterly direction to a slough connecting Kern with Buena Vista Lake.

The area of the district is, in round numbers, 120,000 acres. It comprises at once the most diversified body of agricultural lands in the valley, the most considerably improved, and the furthest advanced in the general system of irrigation works now in progress of construction throughout the valley, and, as well understood, wholly indispensible for vegetable productions of any description in this arid region almost destitute of rainfall.

The lands of this district may be divided into three general classes: 1st, the reclaimed swamp and overflowed lands of the "South Fork," numbering upwards of 32,000 acres, with their soil of dark loam thoroughly enriched with the vegetable decays of ages, upon which that invaluable forage-plant alfalfa thrives with unexampled luxuriance, and Indian corn and the various fruits of the temperate zone yield with surprising abundance; 2d, the gently elevated table-lands further east, whose slight admixture of gravel adapts them most completely to the cultivation of the raisin-grape, the almond, and the various semi-tropical productions; 3d, that body of lands, scarcely elevated above the reclaimed swamp-lands, and constituting the more extensive class of the lands of the valley, whose slight impregnation with silicious substances has proven them unsurpassed for the production of the cereals, as well as most excellently adapted to all the purposes of general agriculture.

The various irrigation works projected and essential for the supply of this vast district, though under process of construction since the year 1870, and prior thereto, are still far from complete. They may be hastily enumerated in their present condition as follows:

1. The "Kern Island Irrigating Canal," the oldest of the district and the most important by reason of its superior location at the highest point on the south bank of Kern River, has a width of 48½ feet in the clear at its head-gate in the northeast corner of section 17, township 29 south, of range 28 east, with a depth of channel of 4 feet and a length of 18 miles; of its branches the "Central," with a width of 20 feet on the bottom and a depth of 3 feet, running in a southerly direction and distant from one to two miles easterly from the main channel, is completed for a length of 8 miles. Its continuation has been projected for a further distance of 7 miles to Kern Lake. The town branch, for supply of the town of Bakersfield and the farming lands in its vicinity, is completed for a distance of 2 miles, with a width of 15 feet and depth of 2. The various distributing ditches connected with this canal and its branches have been treated mostly as burdens upon the lands which they severally supply, and are not borne on the books of the company; their aggregate length may be stated approximately at 35 miles.

Besides the branches above mentioned, a third branch of this canal has been projected, to pass easterly through the town of Sumner; on the highest practicable line, to the easterly boundary of the district; thence southerly, with an ultimate connection with Kern Lake at its eastern extremity; this branch to have a width of 40 feet and a general capacity sufficient to supply the table-lands before mentioned, numbering upwards of 30,000 acres.

The Kern Island Canal with its branches is calculated to supply all the lands lying east of range 27 east, as well as to supply through its several connections with the east branch of the "Stine Canal" such water as may be required by the latter, when available for the purpose.

2. The "Farmer's Irrigating Canal." Head-gate located in the northeast quarter of section 24, township 29 south, range 27 east. Width 50 feet, and depth of channel 3 feet.

The length of the main channel is about 15 miles, consisting almost wholly of natural sloughs and water-courses, the principal of which is known as the "Panama Slough." It has 4 miles of branch constructions, varying from 10 to 20 feet in width, and about 30 miles of distributing ditches. The duty of this canal and its branches is the supply of numerous small farms and communities of farmers scattered through the eastern and central portion of townships 30 and 31 south, of range 27 east.

3. The "Stine Canal." Head-gate at the junction of Old River with Kern River. Width 80 feet, depth of channel 3 feet, and length 15 miles. This canal has an aggregate of 32.30 miles of branches, varying in width from 12 to 20 feet, and 41½ miles of distributing ditches. It shares with the Farmer's Canal the duty of irrigating the two townships last mentioned, besides supplying the easterly tier of sections in townships 31 and 32 south, of range 26 east, and other lands in the southern portion of the district.

4. The "Castro Ditch." Head-gate adjoining that of the Stine Canal, on the east.

Width 16 feet, depth of channel 2 feet, length about 5 miles. This ditch is intended for a limited field of irrigation in the northeasterly portion of township 30 south, of range 27 east.

5. The "Panama Ditch." Width of head-gate, in section 14, township 30 south, range 27 east, 10 feet; depth of channel 2 feet; length of ditch proper and its branches 8 miles. This ditch derives its water supply through the "Panama Slough," in common with the Farmer's Canal. Its field of irrigation is so blended with that of the latter as to be inseparable therefrom.

6. "South Fork." Head-gate in northeast quarter of section 17, township 29 south, of range 28 east. Width 26 feet, depth of channel 2 feet, and length about 3 miles. The distributing ditches connected with this channel have an aggregate length of about 7 miles, and are used for irrigating lands in the immediate vicinity of Bakersfield. The main channel is also used at times for the purpose of increasing the supply of the Kern Island Canal.

Besides the canals and ditches above described may be mentioned five flowing artesian wells, located upon your lands at various points through the district, with depths ranging from 250 to 400 feet, and discharging from 3,000 to 10,000 gallons each per hour. Several additional wells are now under contract, and it is believed that the irrigation of the lands of the district may be greatly promoted through this means at comparatively reasonable cost. The wells heretofore constructed have cost an average of about $2,500 each; but present contracts for boring are being let at the rate of $1,600 per well, with guaranty of flow.

These canals and ditches having been the offspring of necessity, and constructed, without exception, by associations of farmers and owners of land for the purpose of rendering their lands habitable and possible of cultivation, rather than with any chimerical view to speculation in sales of water, the system has necessarily been hastened over a widely extended area at the expense of thoroughness of construction, and the channels are generally not opened to a capacity which the future will certainly require, nor provided with the necessary works for controlling their current and preventing erosion. It will be impossible, therefore, at the present time, to present such a showing of the cost of the irrigation works of the district, even so far as now constructed and in use, as would enable you to apportion the cost among the lands of the district with any degree of uniformity for the purpose of establishing a selling price per acre. A most important objection, furthermore, to the offer of these lands before completion of the general system of irrigation works in its main features, at least with such changes in the general plan as may be found necessary from time to time as the work progresses, would suggest itself in the opening which such course would offer to a wearisome line of obstacles and annoyances through the contumacy or cupidity of individual land-owners of small interest who might stand in your way. It will be remembered in your experiences of the past that many such impediments have been met with, and removed only through the purchase of obstructing lands at exorbitant price.

We would earnestly recommend that before such action be taken the irrigation system of the district be so completed as to place all of your lands with reasonable access to the water necessary for their irrigation, that the total cost of the works thus completed be apportioned *pro rata* among the benefited lands of the district, and that this apportionment be added to the intrinsic value of the lands, to determine the price per acre at which they may be offered in tracts, together with permanent interests in the water-course by which they are severally irrigated. In our judgment this point may be arrived at during the coming year, and in the mean time we would recommend that, if not too burdensome to you, the present favorable terms of lease of these lands be extended for another year.

The marked success of your tenants during the past season has attracted toward these lands the attention of many persons who would without doubt become purchasers when the lands are finally placed upon market, but having no opportunity for remaining in the vicinity, their attention would probably be turned in other directions. Besides, many excellent men and families driven from other portions of the State and the States at our North, through the prevailing drought and absence of facilities for irrigation in our interior valleys on the one hand, and the destructive results of excessive rainfall on the other, are finding their way hither, and as they will form valuable accessions to our community as well as future purchasers of lands, it would seem politic to extend such aid as might enable them to recover from former embarrassments and gain a footing in our valley.

There are in present existence on your lands, at various points throughout the district, fifteen leases of class I, the tracts varying from one to three sections each. These tracts are each provided with a good two-story dwelling, large and commodious barn, granary, repair shop, and well. Lumber for fencing is also furnished free of charge, and such fruit-trees and vines as may be required for use of the occupants. The improvements of these tracts have been made at a cost of from $2,500 to $3,000 per tract.

There are also thirteen leases of class II, in tracts of from 320 to 640 acres; the improvements in this class consisting of a good one-story dwelling of five rooms, a barn with stable room for 16 horses, and a well in each instance; costing in the aggregate from $1,500 to $2,000 per tract. Lumber for fencing, trees, and vines are also furnished this class as in class I. These leases run for a period of five years, and their terms are rent and water free during the first year, and, thereafter, one quarter of the crop for each of the succeeding four years. When necessary and desired by lessees, provisions, seed, feed, and implements are advanced to them during the first year, to be repaid at their convenience during the term of the lease. Additional aid is extended in the offer to purchase their crops at the market rate if they prefer to thus dispose of them.

These operations have given an unmistakable impetus to the development of the country, outside of your own improvements, as may be observed through the various buildings springing up in the district, noticeable among which are the fine residences of J. C. Crocker, esq., recently completed, and the equally imposing edifice of his brother, E. M. Crocker, approaching completion. These gentlemen are among our leading citizens. They own some of the finest farming lands of the district, and propose to make it their permanent home.

As before stated, the cost of the irrigation works of the district cannot be presented at present with completeness sufficient for your purpose, but for your general information such figures as we have are herewith presented, more or less accurate and in detail, according to the control or supervision which your agents have been able to exercise over the system of accounts and affairs of the various channels in which you have interests, to wit:

KERN ISLAND IRRIGATING CANAL.

Statement of cost of construction, repairs, &c., to November 20, 1879.

		Construction.	Repairs.
KERN RIVER DAM			
(In southwest corner section 9, township 20 south, range 28 east.)			
June 15, 1875, to October 25, 1875:			
Labor and team-work (including subsistence, feed, &c.)	$6,215 75		
Expenses (*pro-rata* services, W. H. Conther)	759 65		
		$6,975 40	
Reconstruction, improvements, repairs, &c.:			
April, 1876, to April, 1878:			
Labor and team-work	10,587 36		
Property-account (implements and tools, camp-furniture, &c.)	136 06		
Material (lumber, hardware, &c.)	346 15		
Expense (incidentals)	542 89		
			$11,612 48
Removing portion of dam:			
November, 1878:			
Labor			177 90
HEAD SECTION.			
(From Kern River in southeast quarter of southwest quarter section 9, township 29 south, range 28 east, to head-gate No. 2, near northwest corner section 17, township 29, 28.)			
Canal-bed, cut of 1874:			
February, 1874, to June, 1874:			
Labor and team-work	$6,465 26		
Property	15 75		
Material	261 52		
Expense	971 65		
		$7,714 18	
Original head-gate No. 1 (northwest corner section 16, township 29 south, range 28 east—removed):			
August, 1874:			
Labor and team-work	$1,031 28		
Material	1,862 65		
Expense	253 22		
		3,147 15	

			Construction]	Repairs.
Head-gates of November, 1875 (in canal and south fork, No. 2, northeast quarter section 17, range 29, 28):				
November, 1875:				
Labor and team-work	$1,827 09			
Material	841 12			
Expense	346 92			
		$3,015 13		
Reclamation levee (between above-mentioned gates and Kern River):				
November and December, 1875:				
Labor and team-work		701 76		
Head-gate No. 1 and cut easterly (northeast quarter section 17 and southwest quarter section 9, townships 29, 28):				
December 22, 1878, to March 16, 1879:				
Labor and team-work	$3,663 11			
Material	2,838 01			
Expense	114 89			
		6,616 01		
			$21,194 23	
Improvements, repairs, &c.:				
August, 1874, to November 20, 1874:				
Labor and team-work		3,277 42		
Material		479 43		
Property		20 00		
Expense		555 84		
				$4,332 69
BLUFF SECTION.				
(From head section near northwest corner section 17, township 29, 28, to mill section on north line section 19, same township, including drop and bridge at latter point.)				
March 10, 1877, to August 16, 1877:				
Labor and team-work		$14,958 40		
Material		1,569 02		
Property		835 73		
Expense		1,293 85		
			18,657 00	
Improvements, repairs, &c.:				
October, 1879:				
Labor		122 00		
Expense		4 00		
				126 00
MILL SECTION.				
(From Kern River, at head of Old South Fork, near northwest corner of northeast quarter section 17, township 29, 28, to head of construction of 1874, near south line of section 31, township 29, 28.)				
December 1, 1870, to August 22, 1871:				
Labor and team-work		$10,511 93		
Material		3,369 20		
Property		605 65		
Expense		78 25		
			14 565 03	
Enlargements, improvements, repairs, &c., wing-dam on Kern River:				
July, 1873, to December, 1874:				
Labor and team-work	$401 25			
Material	7 25			
		408 50		

			Construction.	Repairs.
Clearing South Fork south of mill:				
November and December, 1877:				
Labor and team-work		$304 45		
Other improvements and repairs:				
September 27, 1871, to November 20, 1879:				
Labor and team-work	$4,181 89			
Material	816 95			
Property	152 75			
Expense	1,569 30			
		6 720 89		
				$7,433 84
CENTRAL BRANCH.				
Canal-bed and drops:				
October 31, 1877, to May 31, 1878:				
Labor and team-work	$112,249 04			
Material	3,118 27			
Property	608 56			
Expense	306 74			
		16,282 61		
Drops of 1878-'79 (3):				
February 12, 1879, to March 17, 1879:				
Labor and team-work	$476 93			
Material	326 42			
Expense	40 19			
		843 54		
Drain-ditch:				
October, 1879:				
Material	$4 80			
Labor and team-work	243 08			
Expense	33 23			
		281 11		
			$17,407 26	
Repairs, &c.:				
March, 1879 to November 20, 1879:				
Labor and team-work		457 50		
Expense		25 37		
				482 87
LOWER SECTION.				
(From "Mill section" near south line of section 31, township 29, 28, to Kern Lake.)				
February 25, 1874, to June 30, 1876:				
Labor and team-work	$20,704 58			
Material	1,056 10			
Property	291 51			
Expense	2,426 01			
		$24,478 20		
Drops of 1878-'79 (7):				
December 18, 1878, to March 7, 1879:				
Labor and team-work	$1,430 81			
Material	979 27			
Expense	120 58			
		2,530 66		
			27,008 86	
Improvements, repairs, &c.:				
July 1, 1875, to November 20, 1879:				
Labor and team-work		$8,769 28		
Material		2,328 23		
Property		513 25		
Expense		233 62		
				11,844 36

TOWN DIVISION.

			Construction.	Repairs.
(Canals, ditches, &c., within and for the supply of Baker's field.)				
South Branch (L and 19th street southwest corner of township.)				
May to October, 1872:				
Labor and team-work	$852 43			
Material	12 15			
		$846 58		
M and 18th streets extension:				
May 4 to 29, 1875:				
Labor	$153 48			
Material	105 64			
		$259 12		
Other ditches, gates, bridges, &c.:				
March 24, 1875, to June 30, 1875:				
Labor and team-work	$172 71			
Material	164 25			
Expenses	9 75			
		$346 71		
			$1,470 41	
Improvements, repairs, management, &c.:				
May 1, 1875, to November 20, 1879:				
Labor and team-work		$1,196 47		
Material		234 65		
Expense		587 97		
				$2,019 09
Construction and repairs			107,278 19	38,029 25

MISCELLANEOUS.

Of general application or specific application not to be determined:	
February 24, 1874, to November 20, 1879:	
Material (lumber, hardware, &c.)	$385 87
Property (implements and tools, &c.)	1,372 25
Rights of way (purchases and condemnations)	900 45
Labor	479 95
Salaries (July 1, 1873, to January 25, 1879)	11,504 15
Rent (offices, July 1, 1873, to June 25, 1879)	1,131 35
Feed	75 34
Team account (wagon repairs)	68 25
Incidental expense	16,806 78
	32,724 39

RECAPITULATION.

Dam on Kern River	$6,975 40	11,790 38
Head section	21,194 23	4,332 69
Bluff section	18,657 00	126 00
Mill section	14,565 03	7,433 84
Central Branch	17,407 26	482 87
Lower section	27,008 86	11,844 38
Town division	1,470 41	2,019 09
	107,278 19	38,029 25
		107,278 19
		32,724 39
Total Kern Island Irrigating Canal		$178,031 83

FARMERS' IRRIGATING CANAL.

Repairs.

Your interest in this canal being limited, and its administration being in the hands of an association of the farmers whose lands it waters, the accounts of the company have not been kept in manner to enable us to present the cost of works in detail, nor can the necessary classification be now obtained. The cost of construction and repairs in gross is furnished us as follows:

Expenditure upon main line	$16,095 00	
Expenditures upon branches	2,737 00	
		$18,832 00

STINE CANAL.

The early financial history of this canal is involved in more or less obscurity. It is now under supervision of your agents, however, and the expenditures upon it, so far as obtainable, are as follows:

Construction and repairs of main line	$44,218 48	
Construction and repairs of branch No. 1	16,886 97	
Construction and repairs of branch No. 2	12,737 54	
Construction and repairs of distributaries	12,028 57	
Construction in connection with Kern Island Irrigating Canal No. 1	537 01	
Construction in connection with Kern Island Irrigating Canal No. 2	836 89	
		87,245 46

CASTRO DITCH.

A private ditch, the construction and repairs on which have been provided by contributions without formality of accurate accounts.

The cost is stated to be about	2,000 00

PANAMA DITCH.

The remarks above made in connection with the Farmers' Canal will in a measure apply to this ditch. Its construction and repairs have been prosecuted with such irregularity of form and accounting that an approximation merely of the cost can be given, which is stated at about	6,400 00

SOUTH FORK.

Until within a recent period no permanent accounts have been kept of the expenditures on this channel beyond those made by the Kern Island Canal for its own requirements. The addditional expenditures, including cost of head works, is probably not to be stated at less than	3,000 00
Grand total	295,509 29

As shown before, the above figures are not strictly reliable. They present, moreover, a very inadequate idea at best of the expenditures already incurred in the district for the reason that scores of miles of branch canals and distributing ditches now attached to the various lands have been made by private individual and joint communities, without preservation of the accounts or memoranda of their costs. These works assuredly should be considered a charge against the lands of the district in the final apportionment, and we see no method of arriving at a just estimate of their cost except through computation based upon actual survey. These additions, it may be contended, will so augment the grand result as to burden the lands to the point of discouraging purchasers; but it will be remembered that the body of lands to be benefited is coextensive with the vast acreage of the district itself, which, by reason of its general uniformity of surface, contains practically no non-irrigable lands (to coin a word), and should an addition of even 50 per cent. upon the aggregate cost as above be reached with the final completion of the works the rate per acre would still prove insignificant in comparison with the value of the water rights attached to the land and the permanent advantages attending.

Regretting our inability to report at this stage a degree of advancement in the irrigation works of the district sufficient for your purposes, but trusting that under the present very satisfactory rate of progress such point may be reached at an early day,

We are, very respectfully, your obedient servants,

C. BROWER, *Agent.*
WALTER JAMES, *Engineer.*

Report of W. H. Macmurdo, engineer of Irrigation Districts Nos. 2 and 3, dated November 25, 1879.

Messrs. HAGGIN & CARR, *San Francisco:*

GENTLEMEN: I herewith hand you a brief report of the results and effects of irrigation as carried out in district No. 2 for the past four years.

District No. 2 comprises all lands west of Old Kern River, south of New Kern River, and north and west of Buena Vista Slough, being portions of townships 29, 30, 31, and 32 south, range 25, 26, and 27 east of Mount Diablo base and meridian, and containing an aggregate area of 52,000 acres.

The general slope of the district is from northeast to southwest, with an average fall of seven feet per mile. The land is much diversified as regards the character of the soil. In the northern portion of the district the soil is composed of alternating strata of varying thickness of sand and alluvial deposits, containing but little clay in its composition until we approach the central portion of the district. Here the soil becomes more clayey in its composition, and so increases as we go south, until, on the southern portion of the district, we find the soil to be a stiff adobe.

The district is supplied with water for irrigation purposes by the following principal canals and their branches:

The Anderson Canal—Commencing in Kern River, near the center of section 26, township 29, range 27, Mount Diablo base and meridian, and running thence in a southwesterly direction about 4 miles, being 15 feet wide, 2½ feet deep, and having a discharging capacity of 75 cubic feet per second. This canal flows into Belle View ranch, which occupies the northern portion of the district, and is used exclusively for irrigating that ranch. The canal was in a state of construction when it first came under my supervision, and has not been completed at the present time, owing to the impossibility of obtaining many accounts against the canal. I am unable to state the actual cost of construction. The same facts exist in regard to several of the canals named below.

The Gates Canal.—Commencing in Kern River near the west boundary line of section 26, township 29 south, range 27 east, Mount Diablo base and meridian, and running thence in a southwesterly direction about 2½ miles, being 12 feet wide and 2½ feet deep, and having a discharging capacity of 48 cubic feet per second. This canal also flows into Belle View ranch, and is used exclusively for the irrigation of that ranch.

The Buena Vista Canal.—Commencing in Kern River near the east boundary line of section 33, township 29, range 27, Mount Diablo base and meridian, and running thence in a southwesterly direction 13¼ miles, 30 feet wide and 3 feet deep, and having a discharging capacity of 216 cubic feet per second. This canal flows through the Belle View ranch and the greater part of district No. 2, and is owned by yourselves and many farmers who own land in their own right in the southern and central portion of this district. The capital stock is divided into 2,600 shares. Of these 2,600 shares 1,000 belong to the individual farmers who possess farms in this district. These farmers have constructed numerous branch ditches of various widths and dimensions from the main canal to their lands, and are using the water on these lands with good results.

Of the amount of branch ditching, &c., done by these parties and cost of constructing such works I am unable to make any definite statement at present. The cost of constructing the main canal and head-gates and weirs and keeping the canal in good repair and condition to date is $26,125.36.

The James Canal.—Commencing in Kern River near the east boundary line of section 33, township 29, range 27, Mount Diablo base and meridian, and running thence in a southwesterly direction 17¼ miles, 60 feet wide the first three miles and 40 feet wide the remaining distance, being 3 feet deep, and having a discharging capacity of 396 cubic feet per second. This canal flows through the Belle View ranch, and besides furnishing an abundant supply of water for the irrigation of this ranch, it supplies water to the greater portion of the southwestern part of district No. 2, and is owned exclusively by yourselves. From the books and accounts of the secretary I find that $16,600 have been expended in the construction of this canal. This does not include the cost of lumber for weirs, &c., and is below the actual cost of construction.

The Plunkett Canal.—Commencing in Kern River near the center of section 33, township 29, range 27, Mount Diablo meridian, and running thence in a southwesterly direction through Belle View ranch, being 3¾ miles long, 12 feet wide and 2½ feet deep, and having a discharging capacity of 45 cubic feet per second. The water from the canal is used and belongs exclusively to Belle View ranch.

The Meacham Canal.—Commencing in Kern River near the northwest corner of section 6, township 30, range 27, and flowing thence through the Belle View ranch in a southwesterly direction nearly 4 miles, 12 feet wide and 3 feet deep, having a discharging capacity of 48 cubic feet per second.

The Wilson Canal.—Commencing at a point near the head-gate of the Meacham Canal on section 6, township 30, range 27, and flowing through Belle View ranch 2½

miles in a southwesterly direction, 5 feet wide and 2½ feet deep, having a discharging capacity of 18 cubic feet per second.

The last two canals named above belong exclusively to parties owning land west of Belle View ranch, and are used to irrigate lands now being farmed by themselves. I am unable to make any statement of the cost of these canals nor the amount of branch ditches constructed by them.

The Henley Canal.—Commencing on the northeast quarter of the southeast quarter of the southeast quarter of section 9, township 30, range 26, running thence in a southwesterly direction about 2½ miles, 3 feet wide, 2 feet deep, and having a discharging capacity of 10 cubic feet per second.

The Frazier Canal.—Commencing in Kern River on northeast quarter of section 16, township 30, range 26, and running thence in a southwesterly direction about 2½ miles, 5 feet wide, 1½ feet deep, and having a discharging capacity of 18 cubic feet per second.

Weirs.—On section 33, township 29, range 27, near to and below the head-gates of the Buena Vista Canal and the James Canal a weir 150 feet wide and 20 feet long has been constructed with arrangements so constructed that the water in Kern River can be forced into these canals, and the sand which has a tendency to deposit in front of the head-gates can be sluiced out and allowed to pass down the river instead of flowing into the, canals at a cost of $1,600.

On section 1, township 30 south, range 26 east, a combined weir and bridge, 400 feet in length, and 24 feet in width, has been built at a cost of $7,000, and serves the same purpose of the one just described. Both of these weirs are so constructed that the whole interior parts can be removed at short notice, and allow the water to flow in its usual channel without obstruction. A plan of the above described works can be seen and their object better understood by examining the plat of Belle View ranch inclosed with this report. A plan of the weirs used in the principal irrigating canals can be seen and understood by glancing at the plat of the McClung ranch accompanying my report on district No. 3, and marked "A plan of weirs in the Pioneer Canal." Such a weir costs about $75.

It will be seen by the foregoing description of the principal canal that their total length is about 51 miles; their aggregate discharging capacity 832 cubic feet per second. This amount of water if evenly distributed over the whole district would be sufficient to cover the district, 52,000 acres, 20 inches deep in 1,268½ hours, about 53 days, which would in effect be equal to 20 inches of rainfall. But it has been fully demonstrated from experience and practice that to insure a crop of small grain on any part of the northern portion of this district (No. 2), 30 inches of water in depth is necessary the first year, as the hard-pan or clay strata are so far beneath the surface that the water sinks down and drains off toward the lakes.

Owing to the depth of the substrata, it has been found most expedient to irrigate the northern portion of district No. 2, especially the tract known as the Belle View ranch, and occupying the whole northern part of this district (and so shown on the general map of Kern County), to run the water over the surface by means of numerous small ditches, and not by means of the system adopted in district No. 4, where the hard-pan is only a few feet below the surface, and consequently holds the moisture near the top.

This system of irrigation, by means of small ditches, has been found very expensive, as it requires the constant attention of many hands, but it has some advantage over the method of irrigating district No. 4.

1. *In regard to economy of water.*—Water can be caused to flow over the lands in this part of the district, wetting the ground a foot or more in depth, whereas if checks were constructed, as in district No. 4, it would require a much longer time to fill the checks and consequently would require a much larger amount of water, as it would soak or sink in the ground in proportion to the time occupied in filling, and all water sinking below a certain depth is, in great measure, lost.

2. *Economy of cultivation.*—The northern portion of the district is very uneven and rolling and would necessitate the construction of checks so near together that they would materially interfere with the economical working of the land.

3. *Injury to crops.*—The land being uneven and rolling, the high portion of the field would soon drain off and become dry, while the low places would become too wet, thereby producing rust and diminishing the yield of the crop.

It has been found by practice that it is best to run water over the higher parts of a field and allow the low places to irrigate from seepage, as far as possible, thus obtaining a better result and materially reducing the average cost per acre of irrigation.

In the year 1875 water could be reached at a depth of from 8 to 12 feet below the surface of any part of the Belle View ranch; instead of rising nearer the surface from effect of using such large quantities of water during the past four years, as would be naturally supposed, it has in fact changed but little. This is probably due to the fact that the underlying strata have a declination toward the lakes sufficient to drain the water from the northern portion of district No. 2.

I inclose a plat of Belle View ranch (occupying the northern part of this district).

Farming operations have been confined chiefly to this tract. The plat shows a large part of the land cultivated in this district, also the manner of distributing water by means of small ditches, and plans of head-gates and weirs.

The different kinds of crops are designated by means of colors, the principal crops being wheat, barley, and alfalfa, though many different kinds of crops have been cultivated with success.

Cotton and rice have been successfully grown, and preparations are now being made for the more extended cultivation of rice. Flax, tobacco, and other crops have done remarkably well. Oranges, lemons, and many semi-tropical fruits are in a flourishing condition. The grapes raised in this district cannot be surpassed by any section in the State. All the ordinary varieties of fruits are doing remarkably well.

The yield of all crops has been good, notwithstanding the unusual dry seasons, and a marked increase in the fertility of the soil has been the invariable result wherever irrigation has been carried on.

It will be seen by the plat that a large area is seeded in alfalfa. This crop requires but little water after the first year, the deep, loose soil of this district seeming particularly adapted to its wonderful growth, which has often reached the height of eight feet in a few months. In soil of this description the roots of alfalfa reach down from 12 to 15 feet, and at this depth find sufficient moisture to support it through the driest seasons.

4 *Artesian wells.*—On the southern border of this district two flows of artesian water have been secured. On section 11, township 31, range 25, Mount Diablo meridian, at a depth of 385 feet a flow was obtained furnishing 3,000 gallons per hour. This well is cased from top to bottom with a double 8-inch iron pipe.

On section 17, township 31, range 26, a well similar in description, 295 feet deep, flowing about the same amount of water per hour, has been obtained.

DISTRICT NO. 3.

District No. 3 comprises all lands lying north and west of Kern River, north and east of swamp-land district No. 121, and south of Goose-Lake Slough, and includes portions of townships 27, 28, 29, and 30 south, ranges 22, 23, 24, 25, and 26 east, Mount Diablo base and meridian, containing an aggregate area of 63,000 acres. The general slope of the district is from southeast to northwest, with an average fall of 2½ feet per mile.

District No. 3 is composed of several distinct qualities of soil, the eastern portion being similar in character to the northern portion of district No. 2, while the southern and western sections correspond with the description of the southern portion of district No. 2.

District No. 3 receives its supply of water for irrigation purposes from the following principal irrigating canals and their branches, viz:

The Railroad Canal.—Commencing in Kern River, near the southwest corner of section 31, township 29, range 27, Mount Diablo meridian, and flowing thence in a northwesterly direction about 3,000 feet, at which point it discharges into Goose Lake Slough and flows to the extreme northwestern part of the district. This canal is 40 feet wide in the bottom, 2 feet deep, and has a discharging capacity of 160 cubic feet per second.

The Wible Canal.—Commencing at Kern River, near the northwest corner of section 6, township 30 south, range 27 east, and running thence in a northwesterly direction about 1,000 feet to the point of intersection with Goose Lake Canal, thence in the Goose Lake Canal to the point at which Goose Lake Canal discharges its waters in Goose Lake Slough, and from this point through the channel of Goose Lake Slough to the lands along the northern border of this district. The Wible Canal is 40 feet wide, 2 feet deep, and has a discharging capacity of 222 cubic feet per second.

It is in possession of farmers owning land in the northern portion of the district, who have constructed many branch ditches and checks, and has been successfully operated for the past three years. I am unable to state the cost of the main canal or branches, &c., as the work has been entirely executed by other parties.

The Goose Lake Canal.—Commencing in Kern River, near the northeast corner of section 1, township 30 south, range 26 east, Mount Diablo meridian, and runs thence in a northwesterly direction about 4½ miles, at which point it discharges into the Goose Lake Slough, and flows thence in the channel of Goose Lake Slough along the entire northern border of the district, and is taken out at different points along the slough in canals and ditches to irrigate lands in the central portions of the district. This canal has a bottom width of 140 feet, and a depth of 3 feet, with a discharging capacity of 1,050 cubic feet per second, and has been constructed at a cost of $9,000.

The Pioneer Canal.—Commencing in Kern River, near the northeast corner of section 1, township 30 south, range 26 east, and running thence in a westerly direction 11½ miles, and has a bottom width of 60 feet, with a discharging capacity of 450 cubic feet per second, and has cost to construct to its present capacity $43,949.87.

MAP

SHOWING THE LOCATION OF THE

PRINCIPAL MINING COMPANIES

ON THE

BLUE GRAVEL CHANNELS

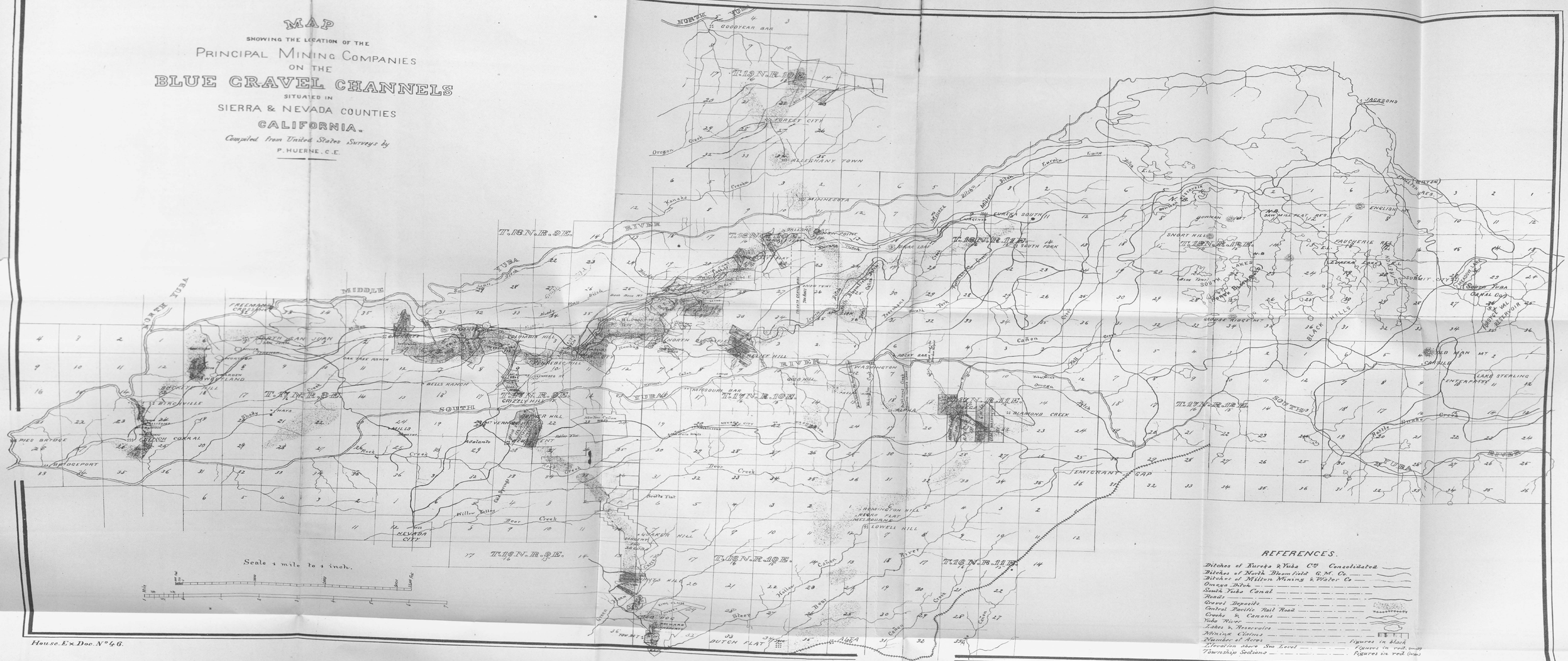
SITUATED IN

SIERRA & NEVADA COUNTIES

CALIFORNIA.

Compiled from United States Surveys by

P. HUERNE, C.E.



REFERENCES.

- Ditches of Eureka & Yuba Co's Consolidated
- Ditches of North Bloomfield G.M. Co
- Ditches of Milton Mining & Water Co
- Omega Ditch
- South Yuba Canal
- Roads
- Gravel Deposits
- Central Pacific Rail Road
- Creeks & Canons
- Yuba River
- Lakes & Reservoirs
- Mining Claims
- Number of Acres — Figures in black
- Elevation above Sea Level — Figures in red. (Miller)
- Township Sections — Figures in red. (Huerne)

House. Ex. Doc. N° 46.

TULARE

R. 22 E. R. 23 E. R. 24 E. R. 25 E. R. 26 E. R. 27 E.

SIXTH STANDARD

R. 28 E.

T. 25 S. T. 26 S. T. 27 S. T. 28 S. T. 29 S. T. 30 S. T. 31 S. T. 32 S.

SEVENTH STANDARD

EIGHT STANDARD

Tulare Lake

Goose L.

Tule Swamp

Kern Valley Water Company Canal.

S. J. & K. R. R. Visalia Division

(Proposed)

Dry Bed of Posa Cr.

Posa

Delano

Lerdo

Gale Ditch

Herd River Slough

S. J. & K. R. R.

Goose Lake Slough

Sand Slough

Old Pioneer Slough

Pioneer Canal

Goose Lake Canal

Kern River

Bakersfield

Sumner

McCord Canal

Elevation 400 Ft.

Beardsley Canal

Johnson Canals

James & Dixon Canals

Nay's Ditch

Eastern Ditch

Dixon Ditch

Buena Vista Slough

Buena Vista Canal

Vista Canal

Stine Canal

Old River

Farmers Canal

East Branch Farmers Canal

Artesian Wells

Elevation 282.6 Ft.

Buena Vista Lake

S. L. District No. 266

Tule Swamp

District No. 121

Slough

Kern Lake

MAP OF A PART OF KERN COUNTY

COMPILED FROM OFFICIAL SURVEYS & RECORDS

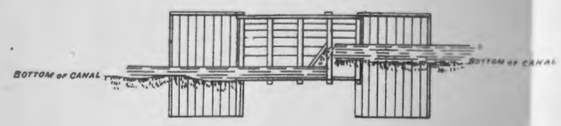
1877.

House Ex. Doc. N° 46.

EXHIBIT "A"
Mc CLUNG.

MAP
OF
McCLUNG RANCH

PLAN
OF
WIERS,
IN
PIONEER CANAL



COUNTY ROAD

PIONEER CANAL
OLD PIONEER CANAL
Water Gate
SCHOOL HOUSE
Slough
Dry
LAND IN CONTEST
JAMES & DIXON CANAL
POTTENGER CANAL
HEADGATE
JAMES & DIXON SLOUGH
DANIEL MORTON
M.F. RAZIER
J.R. ANDERSON
CANAL
DITCH
PENSINGER
PENSINGER'S HO.
JERE. PENSINGER
C.E. BROWN
W.W. DRURY
JOHNSON
MARTIN
E.F. HODGDON
J.T. JOHNSON
JAS. JOHNSON
BKSAID
AUTUMN
KERN
RIVER
R.J. ASHE
1
2
3
4
5
6
7
8
9
10
11
12

CROPS OF 1876.
WHEAT AND OTHER GRAIN
BARLEY
ALFALFA
HAY

House Exc. Doc. No. 46.

EXHIBIT "A"
MACMURDO.

R. 27 E.

MAP
OF
BELLE VIEW RANCH.

PLAN OF BRIDGE.
OVER
KERN RIVER.
BUILT NOVEMBER, 1876.
SEC. 1. T. 30 S. R. 26 E.

CROSS SECTION

RIVER BED

SHEET PILING 9 X 12 - 12 FT.

SIDE ELEVATION
SCALE 1" IN = 32 FT.

PLAN OF WIER.
IN
KERN RIVER
Sec. 33, T. 30 S. R. 27 E. M. D. M.

CROSS SECTION

SIDE ELEVATION
200 FT.

T. 29 S.

DIXON CANAL
GOOSE LAKE CANAL
PIONEER CANAL
KERN RIVER
PLUNKET CANAL
SEC. 33
FIELD No. 7
COUNTY ROAD
FIELD No. 4
FIELD No. 6
FIELD No. 8
FIELD No. 9
FIELD No. 5
FIELD No. 19
FIELD No. 21
FIELD No. 22
FIELD No. 10
FIELD No. 18
FIELD No. 1
FIELD No. 2
FIELD No. 3
FIELD No. 13
FIELD No. 16
FIELD No. 20
FIELD No. 12
FIELD No. 23
FIELD No. 14
FIELD No. 15
FIELD No. 11
FIELD No. 17
JAMES
BUENA VISTA
OLD RIVER
SLOUGH CANAL
SOUTH CANAL
NORTH CANAL
BOARD FENCE
SOUTH LINE
NORTH LINE
BAKERSFIELD ROAD
COUNTY ROAD

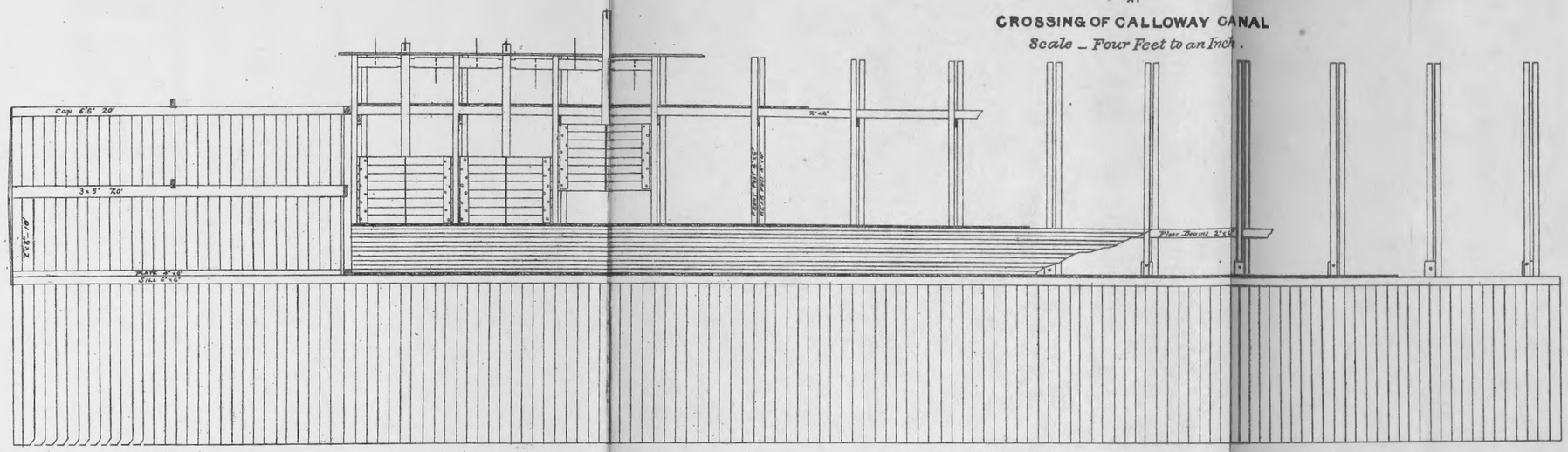
ALFALFA
WHEAT
BARLEY
CORN
OATS

All Ditches are represented by Black Lines, thus ——
Co. Roads ——·——
Board Fences

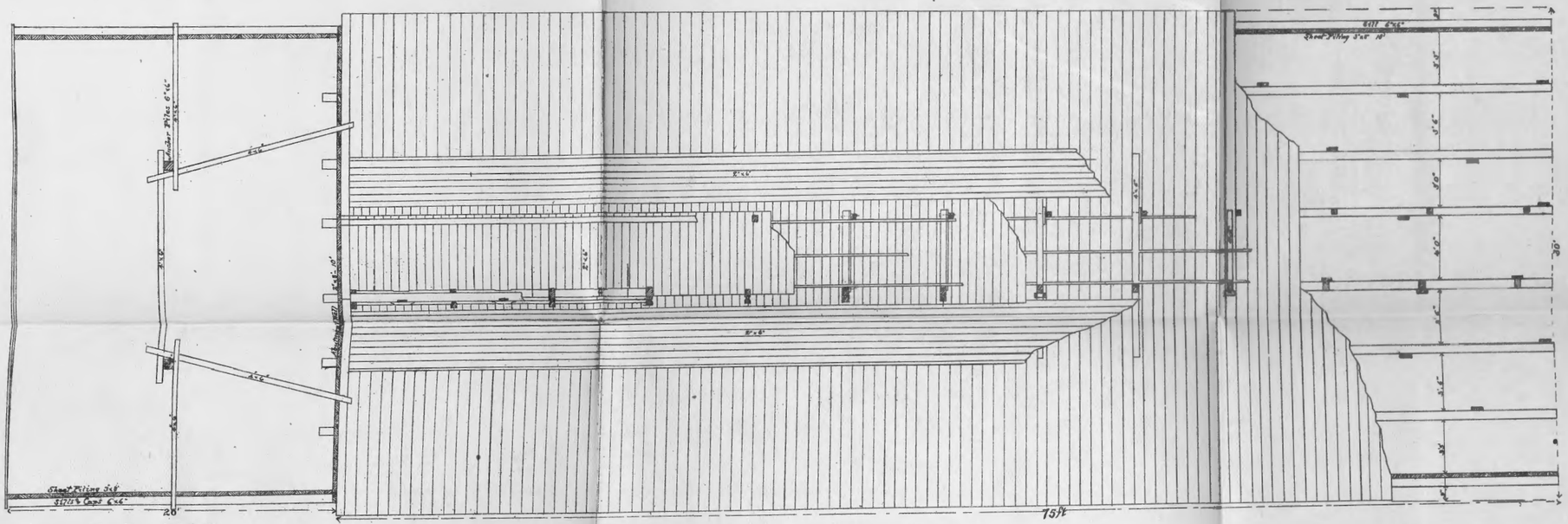
All LANDS in Field No. 20 South of Segregating Line as marked on Map above was sown in ALFALFA in JAN. & FEB. 1876 but owing to failure to get water high enough and in sufficient quantities the Crop was almost an entire failure in FEB. 1877 the above described land was reseeded and the ditches were reconstructed and the land was well irrigated and produced a good Crop of ALFALFA.

A

WEIR
IN
POSO CREEK
AT
CROSSING OF CALLOWAY CANAL
Scale – Four Feet to an Inch.

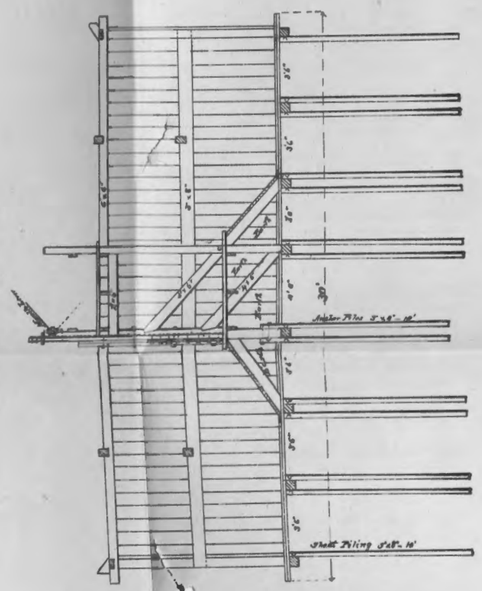


ELEVATION



PLAN OF SOUTH HALF

CROSS SECTION



House Ex. Doc. No 46.

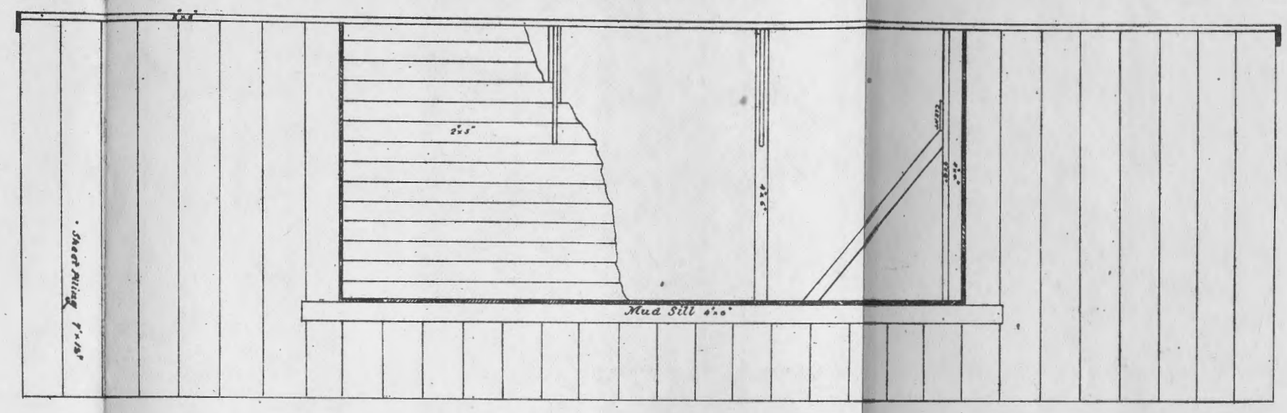
B

WEIR

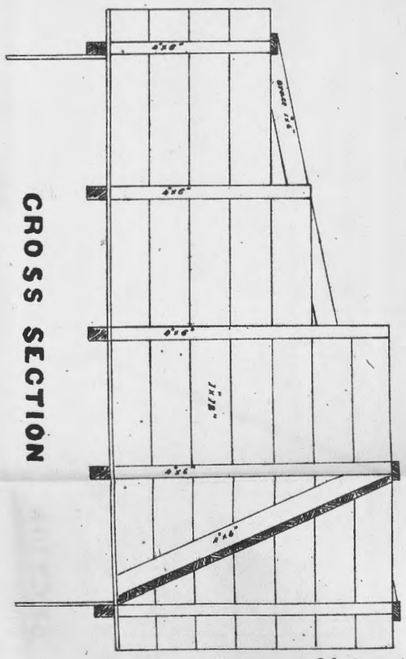
FOR

16 FEET DITCHES

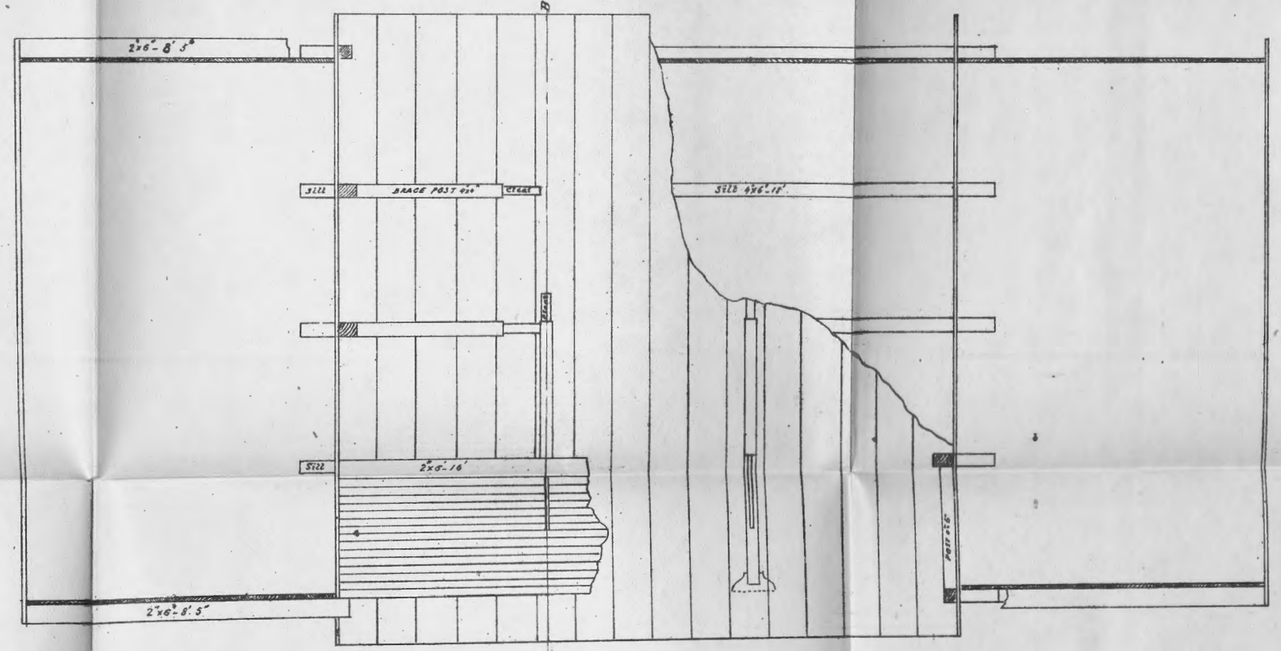
Scale. 2 Feet to an Inch



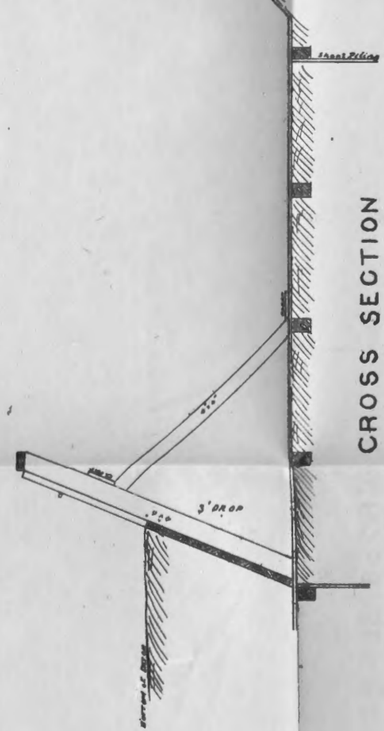
ELEVATION.



CROSS SECTION



PLAN



CROSS SECTION

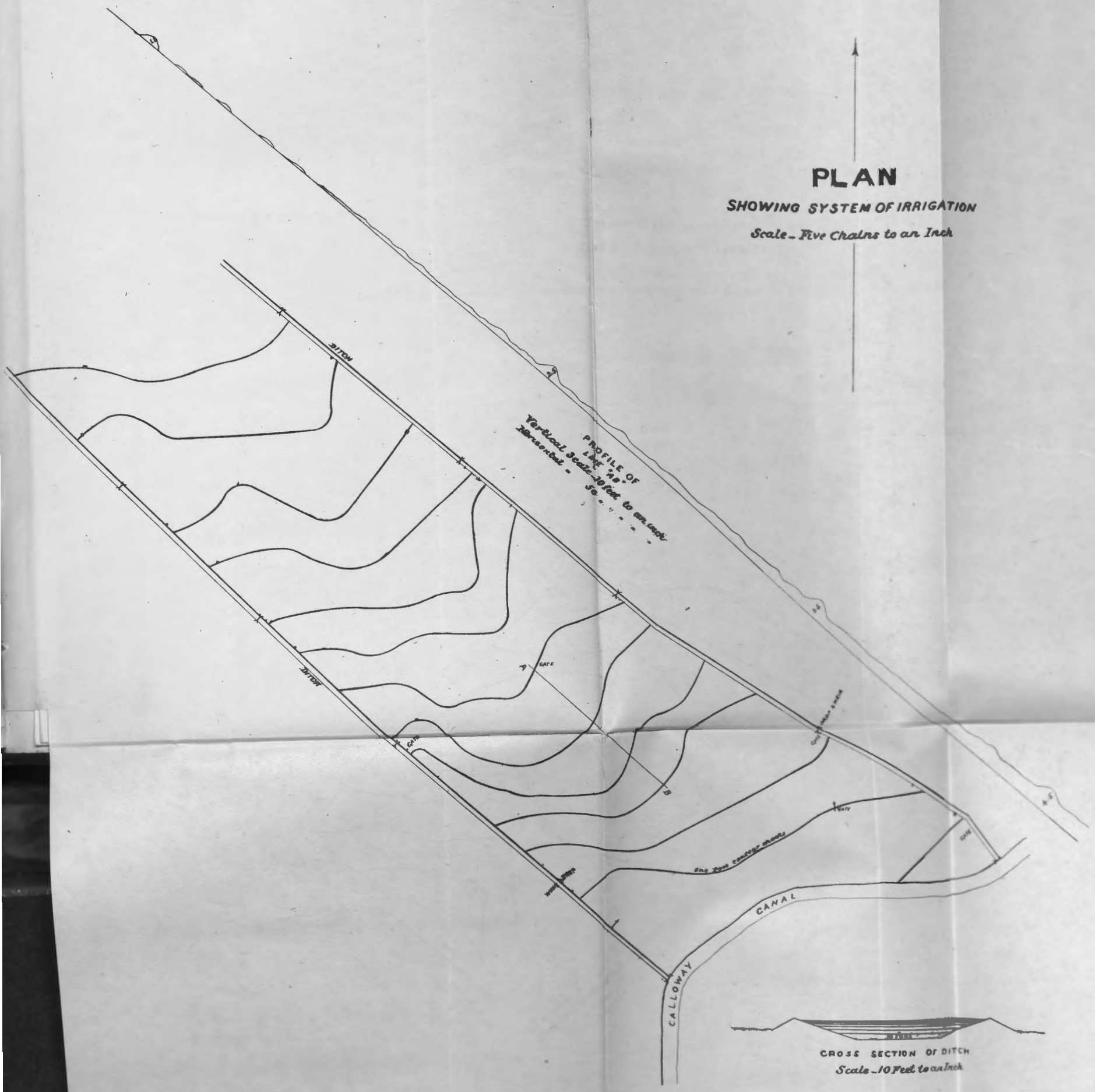
AT 'A B'

House Ex. Doc. N° 46.

PLAN

SHOWING SYSTEM OF IRRIGATION

Scale - Five Chains to an Inch



CROSS SECTION OF DITCH

Scale - 10 Feet to an Inch

CROSS SECTION OF CANAL

Scale - 10 Feet to an Inch.

House Ex. Doc. N° 46.

D

R.XXIV E

R.XXV E.

T.XXVII S.

T.XXVIII S.

Southern Pacific Rail Road

House Ex. Doc. N° 46.

Scale - 40 Chains to an inch

It is contemplated to complete this canal to the northwestern portion of this district, to irrigate the lands bordering on swamp-land district 121 and Goose Lake. It is now in successful operation through the eastern and central portion of the district from the point of diversion from Kern River on the east to section 13, township 30 south, range 24 east.

The Pioneer Canal is divided into 2,400 shares. Of the 2,400 shares 350 shares belong to parties owning land in this district, and the water represented by them is used for the successful cultivation of their farms. They have built branch ditches and checks from the main canal to their lands with good results.

This canal flows through the entire length of the McClung Ranch, and is used for the principal irrigation of that ranch. I inclose a plat of the McClung Ranch, showing the route of the main canal and the many branches, &c.

The James and Dixon Canal.—Commencing in Kern River, on section 3, township 30 south, range 26 east, and running thence in a westerly direction fro about 3 miles, 30 feet wide and 3 feet deep, and having a discharging capacity of 240 cubic feet per second. It is used upon the McClung Ranch and the lands west of the McClung Ranch.

The Johnson Canal.—Commencing in Kern River, on section 6, township 30 south, range 26 east, and running thence in a southwesterly direction about 4 miles, 30 feet wide on the bottom, and 3 feet deep, having a discharging capacity of 240 cubic feet per second. The Jonhson Canal is owned by several different parties who own small tracts of land in the southern portion of this district, and is operated and used exclusively by them.

Ashe's Canal.—Commences in Kern River, on section 3, township 30 south, range 26 east, and runs thence in a westerly direction about 1 mile, 8 feet wide, and 2 feet deep, having a discharging capacity of 24 cubic feet per second. It has been constructed and used by Mr. J. R. Ashe upon his farm upon section 10, township 30, range 26 east.

May's Canal.—Commences on section 18, township 30 south, range 26 east, and running thence in a westerly direction through sections 13, 14, and 15, township 30 south, range 25 east, 8 feet wide and 2 feet deep, having a discharging capacity of 36 cubic feet per second.

The Joice Canal.—Commencing in Kern River, on section 23, township 30 south, range 25 east, and running thence in a northwesterly direction about 4 miles, 12 feet wide and 2 feet deep, having a discharging capacity of 48 cubic feet per second. This canal was constructed with a view of irrigating the southern portion of district No. 3, especially the Buena Vista Ranch, which occupies nearly the entire southern portion of this district and has been in successful operation for the past five years.

By means of this canal, its branches and checks, the Buena Vista and adjoining ranches have been brought under cultivation at a comparatively small expense. From the annual report of the superintendent of the Buena Vista Ranch and accurate accounts of farmers owning adjoining lands, it has been ascertained that it only costs 10 cents per acre to irrigate land in this section of this district after constructing the ditches and checks.

It will be seen by the plat of the McClung Ranch that the same system of irrigating by small ditches has been adopted. This is owing to the same reasons given in my report on district No. 2.

The yield of all crops on the McClung Ranch has been good, and the soil shows the same evidence of increasing fertility from effects of irrigation.

Near the present terminus of the Pioneer Canal (and central part of this district) ranches have been laid out, houses, barns, and all necessary outbuildings have been built at an average cost and expense of about $2,000 for each ranch. These ranches are leased to tenants on the most favorable terms.

The combined bridge and weir mentioned in my report on district No. 2 serves the purpose of controlling the water in the Railroad, Wible, Goose Lake, and Pioneer Canals.

This report is respectfully submitted for your approval, hoping that you will find the results and operations of the past four years will justify you in continuing the development of a larger territory that has for years remained a barren waste.

Very respectfully,

W. H. MACMURDO,
Engineer of Second and Third Districts.

BELLE VIEW RANCH, *November* 25, 1879.

SAN FRANCISCO, *October* 10, 1879.

AUGUST E. GANTZ, United States deputy surveyor, made the following statement:

I have been connected with the surveying department of this State since 1872. I am by education and profession, however, an engineer, surveying being but a slight portion of that.

I will assume that, in consequence of the recommendation which you have made the rectangular system will hereafter form the principal way by which we get at quantities for the purpose of disposing of the lands. It may be done in conjunction with other more scientific methods, but anyway I will assume that the rectangular system remains. The question then arises how to carry it into effect. It can be done direct through Washington—done something similar to what is being done now by having surveyors-general, or persons intrusted with the same duties under different names. I will also assume that hereafter the surveyors-general, or whatever their name shall be, will be absolutely competent men—professional men, that besides knowing all about land entries, &c., could also if called upon make an accurate survey themselves. More than this, they ought not to be political appointments. If they are political appointments what is there to prevent the deputies from also being political appointments. There is the root of the evil. Leaving the surveyors-general themselves out of the question, somebody must be a professional man. If the surveyor-general is not, then the deputy has got to be a professional man. At present, under the present system, the system works absolutely in the direction of swindling and corruption. If it had been invented for that purpose it could not have been invented better. To-day Mr. Jones wants a contract. Mr. Jones says he is a surveyor. Mr. Jones don't know the surveyor-general, but he knows some prominent politician who gives him a letter to the surveyor-general. He is required to step up to the chief draughtsman, who asks him a few questions, but before these questions are asked he is informed that a prominent politician has recommended him, and these few questions are a farce and do not amount to a row of pins, are probably entirely immaterial and do not go to the gist of the thing at all, and the gentleman comes down again and the surveyor-general is informed that he has been examined. I have undergone such an examination myself and know what it is, and that examination I had to undergo when it was intended to throw me out, and so it was severer than usual. This man takes the contract. He takes it at the present ridiculously low rates. The present rates and present requirements are entirely out of proportion. The present rates are not within 100 per cent. of what is required to carry out the laws properly. Anybody who takes a contract at the present rates does so knowing that he cannot carry out the laws. It is so understood, and when he comes back from the field it is so understood, and they say, "He has done the best he can."

This man is supposed to carry out the work "in his own proper person." These words were put into the contracts because heretofore contracts were absorbed by one or two men, and they "subbed" it out among half a dozen different parties, and the work was done loosely and it was not good work; and yet no deputy is supposed to have more than he can do personally within one season. The system is improved in that respect theoretically. You will find that the deputy who don't understand anything about his work during the first or second year gets some other deputy to come and help him, and that other man who does the work does not appear at all. The deputy getting the contract hires a man to do the work. He gets a competent man. In this particular respect I know it is being constantly done. I have not done it, but I have always felt that I worked at a disadvantage. There has been an inclination to be lenient in that respect, and so that as long as a deputy was in the field himself with a party and directed the work, even if the instrumental work was done by another man under his direction, that constituted what the contract calls "in his own proper person." It has been so construed by the present surveyor-general. I have always held that it was too lenient a construction. In fact, I have gone so far as to ask the Attorney-General of the United States, and he was, of course, not entitled to give me an answer that might afterwards come back to him for adjudication; but the construction of the surveyor-general is that as the work was done under their direction that was sufficient. I think that is a wrong construction. That direction requires continuous presence in the field; but I hold that there was no possibility of any proof being adduced of such continuous presence in the field, and those who construe the contracts in that way have a vast advantage over those who did their own instrumental work. Some cases in point are surveys made in the vicinity of Colorado River. I know positively that these surveys were made by parties that were in charge of compass-men only. I spoke of the case, and inquiries developed the fact that these compass-men had been employed only part of the time, and then under the supervision of the deputy. I then tried to prove that these compass-men had been in the continuous employ of the deputy for three years; but that proof was not called for, so I have never given it.

Heretofore a great evil was the collusion between the surveyor-general and the deputies. In the case of Mr. Hardenburg, the Dyers were the well-known men through whom the work was done. Then after Mr. Hardenburg was dismissed Mr. Stratton was appointed and the same "color in blue" continued. The name was changed but the appropriation was again absorbed by certain men. These certain men manage to continue, and exist to this day. They continued in lesser degree through the administration of Lawrence and Ames, and when the present surveyor came in he found

the present state of affairs. He found that these deputies were accused of being members of a ring. Mr. Wagner's appointment was a vast step in advance.

As a remedy for all this I would suggest a positive examination by competent men. I would constitute a board of examination. I would not execute our work by the same method which the Coast Survey employ. We cannot offord it. I would not do that. The remedy is competent men and tenure of office.

Establish a corps of engineers under the surveyor-general. First make him as competent as possible, then have your competent men under him; give them a fixed salary and have them gentlemen.

As far as technical matters are concerned we are behind. The present surveyor-general is no doubt 100 per cent. better than anything we have had for a long time, but the very system under which he exists, the source from which he derives ultimately his power, that is, the appropriation of Congress, everything joins to bring him back again in the same old grooves, the same old ruts. He is constantly beset by the same old political associates. In this case I have reason to believe that the surveyor-general was selected because Mr. Schurz thought him the best man for the place, and not upon the recommendations of any political friends, and I am satisfied that the work is largely better than it was done before for a long time. The "confirmation business" operates in this way, that they consider themselves under obligations to those who do not oppose their confirmation. There was opposition expected to Mr. Wagner's confirmation—a good deal of it.

If there is any way by which at least the subordinates of the surveyor-general could be selected with reference first and foremost to their competency and without reference to their greater or lesser political influence, there should be same way by which every competent man who has no political influence might be selected as a deputy.

Sometime ago the surveyor-general received permission to pay for employés out of the subdeposit fund, and an additional amount of bond, I think $125,000, was required. Now, Mr. Wagner is comparatively an unknown man in San Francisco, and he had trouble to get that bond. The principal rich men in San Francisco are not his friends, so the present chief clerk busied himself in running about getting the bond for him. And now, to show the inconsistency of the thing, Mr Wagner told me shortly after we had that conversation in which he said he was going to get along without a chief clerk, in speaking of Mr. Rickard, "He has not invented gunpowder, nevertheless he is an honest fellow." But the pressure of the friends who had furnished the bonds was great enough, notwithstanding that he thought he was not very bright, and notwithstanding that he had told me he would have no chief clerk—that the law did not know of any such position as chief clerk—notwithstanding all this, there was pressure enough to compel him or induce him to appoint that gentleman chief clerk. There were two contradictory statements for you.

Mr. Wagner abolished the abominable corruption of "extra work." Now, when there is extra work done the amount is paid into the Treasury, and the draughtsmen paid out of that. I do not know whether that is done now, but certainly Mr. Wagner started in with the best endeavors and intentions.

Q. If the surveyor-general should order the work to be done in the ordinary office hours, it would be done, would it not?—A. It is hard to tell. The clerical force is insufficient; but if a person comes in there and offers to pay for that extra work, it is done quick. That money ought to be paid into the Treasury, and then the draughtsmen paid out of it.

Q. Are not any of the draughtsmen now authorized to do work out of office hours, and take the money themselves?—A. No. That was the old rule. If it were not liable to such abuse it would be proper, but you cannot control it. It results in irregular work, and work being done without being paid for. The extra-work charge was abolished by Mr. Wagner, or properly I should say it was abolished, for in fact I do not know whether it is. There is another thing. If you wish to insure prompt work, you ought to pay them promptly. Prompt payment insures prompt work.

Q. Is the office kept open after office hours?—A. Not to my knowledge is the office kept open after office hours, and nobody, to my knowledge, is worked after office hours. If anybody, without the knowledge of the surveyor-general, does work—extra work—and takes pay from individuals, he is now doing it in office hours; he has no right to take work home. Men want to have a motive for working—they want their pay—I speak of the ordinary salaries of the office. In the first place, the salaries are paid quarterly; then the vouchers go to Washington, and then from one place to another until they get into the Treasury Department. I know of cases where salaries are not paid until six months after they are due—even a year after they are due—in my case, for instance. I have worked during the months of August and September, and have been engaged in surveying ranges at a per diem, and the expenses would not be covered by mileage at all. The necessary and actual expenses come out of my pocket, in the first place, and are afterwards refunded. I worked in August and September. I have rendered my account and I expect to have the money for this work in about three months, not for my services, but money that I have actually advanced to the govern-

ment. Our contract states also that we are not allowed to do any private work within the territory covered by our contracts. Now, as far as I myself am concerned, I have steadily refused to take contracts. I have taken no contracts; but this provision is daily, hourly, constantly violated, and lands are picked out—townships are selected with that very purpose in view—to get those townships where the most private work is to be done. Of course, when a gentleman tells you, as he did to-day, that the work cannot be done at the present rates, and after he tells you the work cannot be honestly done—under the rates, it is impossible to do it, and he knows before taking the contract that he cannot do it for you—his reason for taking the contract must be the opportunities for private work, and that he intends to get the money without doing the work.

Q. 13. Is it a fact that more or less contracts are let to men who hire men to go into the field and never themselves leave this city?—A. It is a matter of fact that there exists to-day in this city a force that acts as middlemen between the deputy surveyors and the men in the field. Benson & Co. have a little manufactory of field-notes. They have rubber stamps cut out for each set topographic phrase. The business of that office is the making out of field-notes for parties in the field. It may be done to expedite business. The thing is possible. J. A. Benson is known to be a very good man. I taught him what he knows about the business in 1872. He is known to be on good terms with everybody, and there is a league in Washington, because Mr. Benson is informed from Washington before anybody else here. I will cite a case. This gentleman is known to be on good terms with everybody. Now, if an inexperienced man gets into any dilemma he gets a little hint from somebody that the best thing he can do is to go to Benson's and he is all right. He makes his survey. If he can't get along, he sends for one of that firm to help him (as has been done), and the gentleman then makes out the field-notes and charges so much per township. This man has a direct interest in having as many incompetent men appointed as deputies as possible, because competent men can do their own work just as expeditiously as he can. My field-notes when I come home are ready to be copied, but I use abbreviations and I write hastily. I perhaps cannot lay my book flat, it looks bad, and in such a case I am the last man to copy them.

Q. If a survey was made in Shasta you do not send a man from here, do you?—A. Yes; sometimes they do that. Now, there has been somebody behind the throne. I have been approached within the last few months and asked to "let up." We are now working 100 per cent. better than we ever did; but there is still a great deal of improvement possible, and the principal improvement is competent men, tenure of office, and pay them decently.

Q. Suppose a contract is given a man in Shasta County, how can a man be sent away from here and in the face of the incompetent pay hope to make anything?—A. He can't under ordinary business rules. There is no money in it if he has been sent on such work as I have been sent. I do not know how they do it. There are cases where men are appointed in Shasta County. He sends his bond down here as required and makes his survey. I do not understand how a man can intrust his field-notes to another to rewrite. If he sends these notes down here and they come into the surveyor-general's possession and these notes are found incorrect they are not returned to this man, but they are simply returned to Mr. Benson for correction, and he changes and corrects them. But still Mr. Wagner is 50 per cent. better than we have ever yet had the office.

This manufactory of field-notes has existed for a long time; I do not know just how long; I think about five years. Before that was established they made up their own field-notes; or possibly he was successor to some other person. Before Mr. Benson became the chief man it was necessary to be on the right side of Mr. Dyer.

If the surveyor-general should be ordered to have so many men as their assistants at such and such a salary, these men to be strictly examined and not to be men who acted as chain-carriers for six months and then come and call themselves engineers; if it was necessary that every deputy surveyor should be capable of making a decent map of his own work, and a tolerably well educated man, then you would have better work, provided you pay them when the work is done.

I was out with Mr. Hobbs in the winter among the timber depredations, and the pay for that lagged for five or six months after it became due, and so it has been right straight along. The trouble is that most deputies are in the hands of brokers and pay 2½ per cent. for their pay. You will find that one-half of the vouchers are accompanied by a power of attorney. For instance, I have executed my contract, I have paid all my expenses, and I return my work, and it is proved there is due me $7,000. I have expended all I have, and I know I cannot get a cent for six or eight months; the consequence is that I have to go to some broker, give him power of attorney to draw the check. He then advances me perhaps $1,000 or $2,000 to pay me my own money, and to live myself I have to pay him from 1½ to 2½ per cent. per month until that draft arrives. When it arrives the broker takes out what belongs to him, with the interest, and then passes me the rest.

There is one principal broker here, a man by the name of Greenbaum. Benson is doing a great deal of it himself.

If people will freely tell you their experience you can see the facts themselves and draw your own conclusions. No matter what system you recommend, the proof of the pudding will remain in the eating of it, and it will depend upon how it is carried out.

When a contract is awarded there is no way of testing his instruments. That is a great trouble. The government should certainly in the first place insist upon the best instruments known. The deputy surveyors furnish their own instruments, and they are not tested at all. There should be a standard instrument at each office. He never even brings in his chain to be tested. I do not think they have a standard chain in the office. The only way to test the chains is to compare them with a steel tape. There is supervision over the instruments that are used. We are instructed to use solar instruments. All of the deputy surveyors are provided Nautical Almanacs, but when they do not use the solar instruments they do not have the Nautical Almanac. I know of a man swearing that he ran a transit line, and it was a west line, but he did not look at his needle. I heard that same man testify that a needle line that was run several years ago could be run again. The instructions require that we should use a solar transit or solar compass. I may be mistaken about that, but such is my impression.

We have an immense mass of deputies, out of which I would not employ one hundred and fifty of them. Mr. Van Light cannot be induced to take a contract. Alfred Carver cannot be induced to have a contract. I have not taken any contracts for a long time. The only contract I have taken was the surveying of a range, and at $15 per mile I lost $350 on it.

Q. To whom do the field-notes go, and what proof has that officer of the correctness of the survey?—A. Field-notes go first to the chief draughtsman, and he has no other proof of their correctness than the mathematical correctness on the face of the paper, and the survey, too, is proof. You often find that surveys are correct on paper, but in resurveying the whole or parts you find the undoubted proof that something has been covered up, and I have known instances where not a single solitary line agreed with the field-notes. The examination of the chief clerk passes the survey, and for proof he has nothing but the mathematics upon the papers, and upon which to give his decision. So if anybody sat down in this city and made the mathematics agree this survey would be approved. The only thing that would prove anything is not done, and that is a quiet examination of the work in the field. There is a mode provided for inspection in the field, and the statutes provide for it, I believe, but you cannot appoint an agent unless there is money to carry it into effect.

Q. How many draughtsmen are employed in the land office here?—A. Out of the regular appropriation there are only three draughtsmen employed; the remainder are employed out of these special deposits. The regular draughtsmen vary from two to five or seven. The average amount of special deposit varies very much. There has been a great deal of trouble about the special deposits. It seems that the predecessors of Mr. Wagner went it blind, and the special deposits were exhausted before the mining claims for which deposits have been made were worked up.

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