53D CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { Ex. Doc. 1, Part 2.

REPORT

OF THE

SECRETARY OF WAR;

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE SECOND SESSION OF THE FIFTY-THIRD CONGRESS.

IN FOUR VOLUMES.

VOLUME I.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1893.

CONTENTS.

VOLUME I, ANNUAL REPORTS.

NOTE.—The annual reports of the Chief of Engineers, Chief of Ordnance, and Inspector-General are published in Volumes II, III, and IV, respectively.

REPORT

OF

THE SECRETARY OF WAR.

WAR DEPARTMENT,
Washington, November 27, 1893.

To the PRESIDENT:

I have the honor to submit the annual report of the War Department for the fiscal year ended June 30, 1893:

EXPENDITURES—APPROPRIATIONS AND ESTIMATES.

The expenditures for the fiscal year ended June 30, 1893, were as follows:

Salaries and contingent expenses	$1,992,581.95
Military establishment: Support of the Army and Military Academy.	23,377,828.35
Public works, including river and harbor improvements	20,518,631.41
Miscellaneous objects	6,077,033.18
Total	51,966,074.89

The appropriations for the fiscal year ending June 30, 1894, were as follows:

Salaries and contingent expenses	$2,045,196.00
Military establishment: Support of the Army and Military Academy.	24,563,980.21
Public works, including river and harbor improvements	17,201,165.69
Miscellaneous objects	4,213,183.89
Total	48,023,525.79

The estimates for the fiscal year ending June 30, 1895, are as follows:

Salaries and contingent expenses	$1,697,016.00
Military establishment: Support of the Army and Military Academy.	25,709,895.40
Public works, including river and harbor improvements	21,463,307.65
Miscellaneous objects	3,976,280.70
Total	52,846,499.75

EXPENDITURES FOR THE FISCAL YEAR ENDED JUNE 30, 1893.

Salaries, contingent expenses, postage, etc		$1,992,581.95
Support of the Army and military establishment:		
Pay, etc., of the Army	$12,458,220.87	
Subsistence of the Army	1,608,306.37	
Appropriations Quartermaster's Department for support of the Army	7,755,268.48	
Ordnance, ordnance stores and supplies, and manufacture of arms	837,339.56	
Military Academy	263,409.31	
Hospitals and Hospital Department	253,782.84	
Expenses of recruiting	120,515.87	
Signal Service, contingencies, and shooting galleries	80,985.05	
		23,377,828.35
Public works, including rivers and harbors:		
Arsenals, gun factory, proving ground, etc	957,080.32	
Buildings and grounds at Military Academy and Washington	274,892.48	
Fortifications and other works of defense	3,206,141.20	
Military posts, etc	787,183.98	
Rivers and harbors	15,293,333.43	
		20,518,631.41
Miscellaneous objects:		
National cemeteries, roads, etc	200,791.71	
Relief acts, artificial limbs, trusses, etc	331,465.63	
Arming and equipping the militia	449,680.86	
Publication of official records war of the rebellion	230,900.39	
Support of national and State homes and military prison	3,628,042.36	
Claims of States, volunteers, bounty, etc	1,042,651.05	
National Encampment, Grand Army of the Republic	87,862.31	
Other miscellaneous items	105,638.87	
		6,077,033.18
Grand total		51,966,074.89

OPERATIONS OF THE ARMY.

The Major-General Commanding the Army and the officers in command of the several geographical departments report a state of peace throughout the year unbroken by Indian hostilities or domestic violence. The only active duty the Army has been called upon to perform against armed enemies of good order has been the suppression

and punishment of violations of the neutrality laws of this country and Mexico. That duty has been discharged promptly, vigorously, effectively, and to the credit of the troops in the Department of Texas.

Of the one hundred and twenty-five bandits engaged in the attack on Mexican troops at San Ygnacio, on the 10th of December, 1892, eighty-six were captured by our troops, and of these, seventy-one were subsequently sentenced by the United States Court. The civil and military authorities of Mexico, through the customary channels, have expressed their appreciation of the services performed by the United States in suppressing the raids of outlaws that menaced the tranquillity of both sides of the border. The general commanding the Department of Texas makes special mention of the officers and men of the Third Cavalry for arduous duty performed in the capture of the offenders.

From the facts and conclusions recorded in the reports of this department for recent years, from the ascertained results of beneficia, legislation by Congress, and from the masterful forces of civilization at work it may be assumed that Indian warfare is virtually at an end in the United States, and that beyond occasional calls for police duty in the neighborhood of Indian reservations the Army will henceforth be relieved to a greater degree each year of the labor of armed surveillance over the tribes of the West. The demands for the employment of the Army to preserve order within the States as certainly must become infrequent as State authority, on which that obligation properly rests, demonstrates its complete ability to discharge it.

The changes and recognized tendencies toward change in the services which the Army is maintained to perform, and must hereafter perform, will evidently involve in time considerable changes in the distribution of the troops and the relative proportions of the branches of the service. The effort to maintain a maximum numerical military strength in which foreign powers are engaged is only of remote interest to us. Any considerable increase in the numbers of our Army would not meet with popular favor, and is not suggested by any contingency, immediate or remote. What is desired is a maximum efficiency of the organization, sufficient elasticity to respond readily to any probable tension, the acquisition of the mechanism of warfare in adequate quantity and of the best quality, and such a dissemination of military

instruction as will enable the Federal Government, in the event of war, to summon for the purposes of immediate defense a body of its citizens, not unfamiliar with the rudiments of military discipline and service, sufficient until the great armies which exist in embryo in our free citizenship can be enrolled, organized, and put in the field.

The present organization of twenty-five regiments of infantry, ten of cavalry, and five of artillery, was established to meet conditions which have almost ceased to exist. At thirteen of our large seaports work has already begun, or is projected for the near future, which in extent and nature within a few years will call for the establishment of organized posts of artillery. The conversion of a number of organizations of infantry to the artillery arm is a manifest necessity of the period directly ahead of us, and while present needs do not call for specific recommendations on this point, the certain needs of the future should not be ignored in current legislation and policy.

The abandonment of smaller posts and the concentration of the Army at important centers has been in progress for some years and must continue, with the seaboard and the frontiers as the lines along which in time the bulk of the Army must be massed. This patent fact has its bearing on all questions of the establishment and expansion of military posts, the construction of buildings, and the accumulation of supplies. It opens up new fields of instruction and service for the militia of the States on or near the lines of national defense, and enhances the importance and dignity and increases the responsibilities of the militia removed from those lines. These considerations and others point to the need of progressive military instruction, not only in the Army but among the people, and in general directions mark the scope of future operations of the War Department and the Army.

STRENGTH OF THE ARMY.

The total apparent strength of the Army on September 30, 1893, was 27,922 officers and enlisted men. Of the officers nine are general officers, sixteen are assigned to duty in the Adjutant-General's Department, seven in the Inspector-General's Department, eight in the Judge-Advocate-General's Department, fifty-nine in the Quartermaster's Department, thirty-one in the Pay Department, one as Chief of the Record

and Pension Office, and thirty as post chaplains. The remaining officers and enlisted men are assigned to branches of the service as follows:

	Officers.	Enlisted men.	Total.
Medical Department	187	787	974
Corps of Engineers	121	435	556
Ordnance Department	58	525	583
Signal Corps	10	50	60
Cavalry	432	5,962	6,394
Artillery	285	3,469	3,754
Infantry	864	11,676	12,540
Miscellaneous, recruits at depots, Indian scouts, etc		2,874	2,874
Total	2,144	25,778	27,922

With so small a force, permanency in the personnel is evidently desirable, especially as in time of war the Army must be relied on to furnish instructors, drillmasters and noncommissioned officers for the large body of volunteers that would be required for national defense. This permanency is already secured in the personnel of the officers, as during the fiscal year the Army lost but 77—by retirement 45, by death 18, by resignation 13, and by dismissal 1. Fifty graduates of the Military Academy were commissioned as second lieutenants; 12 second lieutenants were appointed from the enlisted men and twelve assistant surgeons, 3 chaplains, and 1 paymaster were appointed from civil life.

But the change in the personnel of the enlisted men was very great. The Army lost 9,456 enlisted men during the year—2,338 by expiration of term, 1,075 by purchase, 4,189 by discharge for various causes, 1,682 by desertion, and 172 by death. The recruits for the year numbered 9,074. These figures give added force to the recommendation of the Major-General Commanding the Army, elsewhere referred to, that the laws regulating enlistment be modified by the reduction of the period of first enlistment from five to three years, and by the repeal of the act limiting to ten years the maximum period of service of enlisted men. While some of those discharged from the Army reënlisted, obviously the Army lost a large percentage of its experienced enlisted men during the year and was compelled to fill their places with raw recruits. The changes in the laws referred to would unquestionably reduce that percentage. Estimating by the number of men drawing reënlisted pay, the ten-year law affects directly about 6,000 men who have already had

five years' experience or more in the service, and are presumably our best trained troops.

The general appearance of the Army at inspection and review, and the condition of uniforms, arms, accouterments and equipments is reported very satisfactory, and the efficiency of the noncommissioned officers is commended.

DISTRIBUTION OF THE ARMY.

The distribution of the Army by geographical departments on September 30, 1893, was as follows:

Departments.	Officers.	Enlisted men.	Total.
California	127	839	1,466
Colorado	285	3,488	3,773
Columbia	129	1,366	1,495
Dakota	280	3,534	3,814
East	400	4,812	5,212
Missouri	305	3,412	3,717
Platte	213	2,81	3,026
Texas	162	1,871	2,033
Total	1,901	22,635	24,536

With a steadily decreasing need for the employment of troops against the Indians, and with the development of our coast defenses, a concentration of the army on the seaboard and the frontiers, as already observed, is manifestly inevitable in the not remote future.

The demands for the detail of officers on detached service increase yearly, and will necessarily continue to increase as the instruction of the Army reaches a higher plane and the Army assumes more extended duties in the general military education of the people. Last year 53 officers were assigned to West Point, 21 as inspectors of the national guard of the States, and 75 as instructors at military colleges and academies. For the recruiting service 106 were required, 75 were assigned as students in the service schools, and 43 served on the staffs of general officers. Twenty-four were detailed to duty at the World's Columbian Exposition, 6 to the arsenals, 5 to the Light-House Board, 6 to the military prison, and 12 were on special detail at the seat of Government. Seventeen acted as Indian agents, 7 were detailed for study abroad, and miscellaneous special duties were assigned to 20, making in all 470 thus detached from their commands for longer or shorter periods during the year ending June 30, 1893.

Both the heads of the several bureaus of the Department and the

generals commanding geographical departments make mention of an insufficient number of officers, and while the Columbian Exposition this year made demands on the service which will not be repeated, the time is not distant, if plans for the development of the educational purposes of the Army be carried out, when the number of students at the Military Academy should be increased.

The Quartermaster-General reports that transportation for 367,577 persons, 6,948 animals, and 99,692 tons of material was furnished at a cost of $2,286,915.76.

At the end of the year there were on hand 6,647 cavalry and artillery horses, 293 team horses, and 3,981 mules. The mount of the Army is reported superior.

Of $515,820.96 available for the construction of buildings at, and the enlargement of military posts designated by the Secretary of War, a balance of $120,397.30 was on hand June 30, 1893.

Work progresses satisfactorily on the new military post, Fort Ethan Allen, Vermont, and on the enlargement of the Plattsburg barracks. Contracts for the Omaha depot have been let. Surveys have been made for the proposed military posts near Little Rock, Ark., and near Helena, Mont.

In all posts which give promise of permanency it has been the aim of the Department to construct buildings of brick, stone, or other enduring material, and of solid workmanship, with regard to convenience and improved sanitary requirements. In these respects, and architecturally our military structures compare favorably with similar military structures abroad.

The health of the Army during the past year has been excellent. The rate of admission to sick report per thousand of strength was 1,270.42 as compared with 1,364.78 during the previous year and 1,459.65 during the preceding decade. The lowest recorded admission rate, 1,247 in 1887, is practically the same as that now reported. Excluding the recruiting depots, arsenals, and smaller posts, Fort Barrancas may be regarded as presenting the worst record.

In June last, upon recommendation of the Surgeon-General, authority was given to establish in this city an Army medical school for the purpose of giving special instruction to approved candidates for admission to the Medical Corps of the Army in their duties as medical officers. The course of instruction will be for four months annually, commencing on the first day of November. It is believed that by thus supplementing, under the tutelage of experienced army surgeons, the college

courses of the young men accepted for appointment much benefit will be derived. Care has been observed so to organize the school as to add but a nominal sum to the expenses of the department.

The Acting Judge-Advocate-General reports 2,198 trials by general court-martial for the year ending August 31, 1893, or 28 less than the preceding year, and 14,988 trials by inferior courts, compared with 16,670 for the previous eleven months. The trials for desertion reach 521, or 46 more than the previous year, attributable in part to the more certain apprehension of deserters since the reward of capture was increased. As the total number of desertions was nearly 1,700 the percentage of apprehension continues small, and the problem of preventing desertion is still unsolved.

The number of men tried by inferior courts was 9,062, many of them for minor offenses, and to reduce the number of these trials, where the penalty is slight, it may prove advisable to permit company, troop, and battery commanders, under direction of superior officers, to allow offenders to elect between trial or extra hours of fatigue duty as punishment without trial. Obviously the frequency of trials tends to deprive them of their admonitory effect. It appears that over one-third of the enlisted men of the Army were tried by summary or other courts during the year, a percentage discouraging to recruits and conveying an erroneous impression of the state of discipline in the Army.

PERIOD OF ENLISTMENT.

Under existing law the minimum period of enlistment in the Army is five years and the maximum of service for the enlisted man is ten years. Both limits appear to have been fixed under misapprehension of the conditions of military service in this country. The well-nigh unanimous testimony of the officers of the Army reinforces the conclusion, drawn from a study of the ultimate purposes of our military organization, that the statutes imposing these limits impair the present efficiency of the Army, impede its progress toward definite though remote aims, and should be modified by Congress. Obviously an army of 25,000 men, in the event of war, would be barely adequate to furnish the number of noncommissioned officers and well-trained soldiers required to command and instruct the large volunteer forces needed to defend our two long and densely populated seaboards and two long and exposed frontiers. While war with a foreign power is a remote contingency, to provide against the possibility of it is the main warrant for our large expenditures for the military establishment.

The function of the Army is to furnish in time of need a nucleus of experienced soldiers. Men capable of becoming such, and willing to make their careers in life military, are clearly the most desirable element in the Army. Its numerically insignificant proportion to the entire population capable of bearing arms forbids its use as a temporary school of military instruction in time of peace.

The Army may be effective in aiding in the systematic instruction of bodies of troops, organized under State authority, especially in the use of heavy ordnance. It may be effective, through its officers, in the systematic instruction of young men in colleges and schools. Excellent work has already been accomplished in these directions. But the instruction of a few hundreds or thousands of individual citizens for ten years, at the end of that period to be turned adrift into civil life, puts military service in the undesirable category of uncertain occupations, with no resultant benefit to the country, the Army, or the citizen.

On this subject the Major-General Commanding the Army presents these weighty considerations:

"The benefit to the country from the military training of the small number of men who are discharged after ten years of service is quite insignificant. They do not amount to as many as one in four thousand of the arms-bearing population of the United States. In a country whose policy is based upon universal obligation to military service and the development of the ultimate military strength of the nation, and where a large standing army is maintained, partly as a school in which all young men capable of bearing arms may be trained, a short term of active service, generally of three years, enables the Government to give that training to every young man capable of bearing arms. In our country the Army is far too small to serve as a valuable training school of this character. The organized militia of the several States serve such a purpose to a much better advantage, without drawing young men away from their civil avocations.

"It therefore seems advisable that the term of enlistment in the regular service in this country be reduced from five to three years, and that the legal restriction upon reënlistments be removed, so that the War Department may be at liberty to continue in service those enlisted men whose services are found to be valuable."

For some years past my predecessors and the Generals Commanding the Army have recommended legislation to secure three-battalion organization for infantry regiments. The argument for the change

remains as strong as ever. Eleven years ago General Sherman, before retiring from command of the Army, pointed out the great advantage of this organization in enabling us to put a large and effective force in the field upon short notice, by merely enlisting a sufficient number of additional private soldiers, the officers and organization being always ready to receive them. I renew the recommendation.

The widest diversity of opinion exists concerning the usefulness of separate organizations of Indian troops. Between March 9, 1891, and June 30, 1893, the whole number of Indians enlisted in the line was 963, and the actual number in the ranks at the latter date was 771. Without reviewing here the arguments and facts adduced against and in favor of the enlistment of Indian companies, the former are strong enough to render inadvisable an increase of the present force; the latter are strong enough to justify the prosecution of the experiment until further trial has indicated whether the Army can wisely be recruited from the Indians, and if so, to what extent. The advisability of employing individual Indians as scouts has never been called into question.

THE NEW MAGAZINE RIFLE.

The adoption of a magazine rifle of reduced caliber is unquestionably the most important step taken for the infantry arm of the service since the close of the civil war. It brings our Army abreast of the most advanced armies of Europe in the matter of infantry weapons. The rifle finally selected, the Krag-Jorgensen modified, was not chosen until the most exhaustive examination had been made and opportunity afforded for reconsideration. The board designated to select the arm spent eighteen months in examining the fifty specimens of magazine rifles presented by American and foreign inventors. Pursuant to act of Congress of February 27, 1893, a board of officers assembled in March to review the conclusion already reached, if an equal or superior weapon of American invention should be submitted to its examination. Fourteen arms of American invention were then inspected, but none meeting the requirements, the appropriation for the new arm became available under the terms of the law.

Work was begun to adapt the National Armory at Springfield to the manufacture of the new weapon in September, 1892, and at the close of the last fiscal year the manufacture of the old .45 caliber rifle was discontinued. The change in arm has involved many changes and readjustments in the machinery of manufacture, but these have been

made and a limited number of the new magazine rifles will be completed and ready for delivery within the next sixty days, while the full supply for the equipment of the entire infantry force will be delivered before the close of the coming year. The caliber of the new arm is the same as the Russian, and slightly smaller than the German, French, English, and Austrian. The Major-General Commanding the Army recommends that a reserve supply of the new arm be provided sufficient for the regular troops, the organized militia, and such volunteers as may be immediately called into service in the event of war.

SIEGE AND FIELD GUNS.

Ten 5-inch rifled cannon were completed during the year at the Army Gun Factory at Watervliet, and ten more are in process of manufacture. Carriages for these guns will be finished during the coming year at the Rock Island Arsenal.

Ten 7-inch howitzers have been completed at the gun factory, and ten more are in process of manufacture. The experimental carriage for these is being made and will soon be tested. A sufficient number of carriages to mount these howitzers will be made if the test is satisfactory.

One 7-inch steel mortar will be completed in March, the design for the carriage of which is not yet finished.

Twenty-four 3.6-inch steel field guns will be completed by March, and sixteen 3.6-inch steel field mortars have been completed, with carriages and platforms, and will soon be issued to the artillery.

Fifteen 3.2-inch steel field guns will be completed this year, giving the Department in all 165 guns of that caliber. These serviceable guns are issued to the Army, to the service schools, and to an extent to the militia. The issue of a limited number to colleges and schools which manifest an especial interest in military instruction and show a large enrollment for the purpose may hereafter be deemed advisable. It is earnestly recommended that the manufacture of these guns be continued.

Four 3-inch mountain guns, purcha sed of private manufacturers will soon be placed in service.

SEACOAST DEFENSE.

At the outbreak of the civil war the fortifications and seacoast defenses of the United States in extent and armament fully met the

requirements of the period and inspired our people with a sense of security as well as elicited the approbation of competent foreign engineers and artillerists. But while that struggle gave a tremendous impetus to the military art and worked the greatest changes of the century in the methods and mechanism of warfare on sea and on land, we ourselves, who furnished the examples, have been the last to profit by our own experience. The exhaustion following a long conflict and the desire of our people to be at peace are adequate reasons for our slow progress in the art of war for the twenty years following the restoration of the Union. But within the last decade public attention in this country has addressed itself vigorously toward our insufficiency to meet a foe on land or sea, armed with the appliances and inventions of recent years, and Congress has promptly and generously met the popular demand for a military and naval armament, which shall not be a menace to other powers, but shall be recognized by them as sufficient to effect our own security and inspire respect for our position among the nations.

The project of national defense, upon which this Department is now engaged, takes its origin in the act of March 3, 1885. Under that act a comprehensive scheme of seacoast defense was devised by a board on fortifications, of which my distinguished predecessor, the Hon. William C. Endicott, was president. That scheme contemplated a system of fortifications at twenty-seven of the principal ports of the country (to which Puget Sound was subsequently added), requiring in all 677 guns and 824 mortars of various calibers, constructed in accord with the improvements of the age in material and mechanism, and mounted in fortifications of the most approved construction. It was estimated that thirteen years would be required for the execution of this project from the date of the first expenditure in pursuance of it. One-half of that period has not yet elapsed, but the progress thus far made is sufficient to warrant the belief that, with adequate appropriations, the essential features of the plan can be carried out within the specified time, and that by the end of the century the defenses of the United States will forbid an attack upon any of our principal ports by the most formidable fleet afloat.

Since the last Annual Report of the Secretary of War the first detail of the comprehensive scheme of defense has been practically completed. The mounting and successful operation at Sandy Hook, at the entrance to New York harbor, of the first 12-inch breech-loading steel rifle, the 1,000-pound shot of which can penetrate 23 inches of steel armor at

1,000 yards, and 13.35 inches at 12.4 miles, with a lift removing it from the range of hostile fire, behind a wall 70 feet in thickness, of concrete and sand, is the proof of our capacity for complete self-defense. The direct cost of this finished type battery has been as follows: For the 12-inch gun, $47,227; for the carriage, $19,899; for the lifting mechanism, $174,000; and for masonry and sand covering of the emplacement and battery, $283,000; in all, $524,126, or with the second gun in position, $591,252.

This type gun is the visible evidence of remarkable progress during the last eight years. It signifies that within that interval our steel manufacturers have established plants which can produce the heavy forgings required for these high-power cannon. Between the date of contract and the first delivery of forgings for the 12-inch gun, eighteen months elapsed. It signifies the establishment of a Government plant able to assemble and finish these guns in a fashion elsewhere unsurpassed. The erection of such a plant, and the invention and manufacture of suitable machinery for it, have taken several years. It means the invention and manufacture of a gun carriage capable of bearing the weight of over 50 tons and resisting the recoil of this great mass of steel, the invention and construction of mechanism to lift the gun body and carriage above the line of defense until the fire of the gun has been delivered, and then to retire it from the fire of an enemy, and the preparation of extensive emplacement of concrete and embankment.

Time was a large factor in all these processes, which have taxed the inventive and mechanical ingenuity of the Corps of Engineers and Ordnance Department and of private manufacturers; and in producing types to determine subsequent construction expense was heavy from the experimental nature of much of the work. The mounting of the first gun is the promise of reduction hereafter of these two factors in the programme of seacoast defense.

PLANS FOR THE YEAR.

The Ordnance Department has under construction sixteen barbette carriages for guns of different calibers, and at the end of the current calendar year this department will have in readiness to be mounted on these carriages and on lifts for the 12-inch guns, and on disappearing carriages for the two smaller calibers, nine 12-inch guns, twenty 10-inch guns, and thirty-four 8-inch guns, besides seventy-five 12-inch mortars. The Corps of Engineers is now engaged in preparing emplace-

ments for the following guns at the following points, and in constructing casemates whence to operate submarine mines and torpedoes:

	Guns.			Mortars—	Case-
	12-inch.	10-inch.	8-inch.	12-inch.	mates.
Portland, Me		2			4
Boston, Mass		4		16	4
New York, N. Y	2	3	5	32	5
Washington, D. C		2			2
Hampton Roads, Va		3			2
San Francisco, Cal	2	6		16	7
Total	4	20	5	64	24

The Chief of Engineers reports in detail concerning this work, some of which is already finished, some approaching completion, and part merely planned or just begun. The scheme of defense for the six ports named, upon which progress is reported, contemplates for the present the following armament:

	Guns.			Mortars -	Case-
	12-inch.	10-inch.	8-inch.	12-inch.	mates.
Portland, Me	18	10	10	48	4
Boston, Mass	12	15	5	128	4
New York, N. Y	21	15	9	176	5
Washington, D. C	4	6	3	8	2
Hampton Roads, Va	5	10		32	2
San Francisco, Cal	33	28	19	144	7
Total	93	84	46	436	24

The projects for the defense of Philadelphia, Pa., and Baltimore, Md., are not yet ready, but one casemate at each point has been finished for submarine torpedo defense. The project for New Orleans, La., is under consideration. The plans for the year include the defenses of Narragansett Bay, R. I.; Charleston, S. C.; Tybee Roads and the mouth of the Savannah River, Ga.; and Pensacola, Fla. Work will thus be in some stage of progress at thirteen of the twenty-eight points recommended for defense by the Board on Fortifications in 1885. The plans for Narragansett Bay, Charleston, Tybee Roads, and Pensacola contemplate for the present year emplacements for three 12-inch guns, seven 10-inch, three 8-inch, and four batteries of sixteen 12-inch mortars.

SITES AND EMPLACEMENTS.

With the choice of a model of a disappearing gun carriage for the 10-inch and 8-inch guns from among types submitted, which will prob-

ably be made within a few months, the work of making and mounting guns for sea-coast defense will outstrip the preparation of emplacements for them at the present rates of progress. It is desirable that the two should go hand in hand. The number of guns ready to be mounted at the end of the calendar year has been given. By the 1st of next July the Army Gun Factory will have produced twelve 12-inch guns, twenty-seven 10-inch, and thirty 8-inch guns, to which may be added one 10-inch gun and two 8-inch guns, the first of the contract for one hundred guns with the Bethlehem Iron Works, all of which by contract are to be delivered before or during the year 1903, and eleven 8-inch guns, concluding the contract with the West Point Foundry.

The annual capacity of the Watervliet Gun Factory will be fifteen 12-inch guns, fifteen 10-inch, and twelve 8-inch, to which in time will be added three 16-inch guns, should Congress see fit to order the manufacture of that caliber. Provision has been made for forgings for sixty-seven 12-inch guns, one hundred and six 10-inch, and seventy-nine 8-inch guns, including those already made, and those in process of manufacture, or provided for by appropriation or contract.

To render these guns available, fortifications and emplacements for them must be prepared, and, preliminary thereto, suitable sites must be secured in addition to those now owned by the Government. The Chief of Engineers estimates that nearly 1,700 acres should be acquired at different localities on the coast, and as much of this land, situate near the growing centers of population, continues to increase in value, it is to the obvious interest of the Government to acquire it at an early date. It must be borne in mind that on the one hand the range of artillery has increased wonderfully, and on the other population has extended from the cities since most of the present Government reservations were acquired, and to meet both conditions in many cases new sites are needed. The wisdom of this policy is forced home by the fact that the Government in January paid nearly $600,000 for eighty-two acres, near Fort Wadsworth, N. Y., required for the defense of New York Harbor. The estimate of $500,000 for the acquisition of sites this year is thus apparently not excessive.

EXPENDITURES.

For fortifications and works of defense during the year $1,586,234 was expended for armament, forgings, gun manufacture, carriages, powder, and projectiles; $730,000 for gun and mortar batteries;

$633,739 for sites for seacoast defenses; $105,619 for torpedoes. Of $552,079 appropriated for the Board of Ordnance and Fortification, whose duty is chiefly to consider and recommend for trial experimental devices, there remained on October 31, 1893, a balance of only $89,771 for general purposes, and it is desirable that this be increased. Attention is invited to the estimates of the Chief of Ordnance for armament of fortifications. It is believed that the policy, in the execution of which these appropriations are required, is established in public favor and by recognized public necessity.

TESTS AND EXPERIMENTS.

The tests of the 12-inch, 10-inch, and 8-inch guns have been somewhat delayed through the failure of our manufacturers to produce suitable powders and through difficulties arising out of the slow progress made toward the establishment of type carriages for the 10-inch and 8-inch guns, but the guns have answered admirably all the tests to which they have been subjected.

During the year experiments have been conducted with several high-power guns different from the established service models, and will be continued as others are submitted for test.

Present contracts call for the delivery of one 8-inch and two 15-inch pneumatic dynamite guns, complete with carriage and projectiles, for trial at Sandy Hook by June 27, 1894, and three 15-inch guns of the same type at Fort Winfield Scott, Cal., by July 17, 1894. Though this type of gun has met tests abroad, in this country it is still to be classed as experimental.

Tests of various quick-fire guns, submitted by private manufacturers, foreign and domestic, will be continued during the year.

MORTARS.

In our general scheme of coast defense the 12-inch mortar holds an important position. That scheme contemplates the use of 824 mortars, and provision has thus far been made for 80. Two types are employed, cast-iron and steel-hooped, and all-steel. Under private contract the Providence foundry has delivered 30 cast-iron steel-hooped, and the South Boston foundry has delivered 23, and will complete its contract for the remaining 20 by the end of the calendar year at the works of the Builders' Iron Foundry, at Providence. The type all-steel mortar has been partially tested, and 7 will be finished at the Army Gun Fac-

tory during the coming year. The increased strains from these mortars have required modification of the carriage, but the type of carriage for service is already established. Twenty-two of these are now completed and 57 more under construction. Congress is urged to provide for this most useful, economical, and important arm of coast defense, work upon which must stop during the year, unless an appropriation is made.

GUN CARRIAGES AND LIFTS.

The invention and manufacture of disappearing gun carriages has lagged far behind the manufacture of the guns themselves. The adoption of the hydraulic lift and suitable carriage therefor meets the needs of the guns of 12-inch caliber. Two of these gun-lift carriages are being made at the Watertown Arsenal. But the type disappearing carriages for the 10-inch and 8-inch guns have not yet been established. To encourage speed to this end the Department has employed the system of bonuses, which has produced such satisfactory results in the Navy Department, and offers additional compensation for the manufacture before seven months of a disappearing carriage to meet the requirements. The best thought of the Ordnance Department has been addressed to this problem, and the Gordon counterpoise carriage, the modified Gordon carriage, and the Crozier-Buffington carriage, the inventions of our own officers, have undergone or soon will undergo test. Selection from among them is deemed probable within a few months. Delay has been due in part to the inability to secure necessary heavy steel castings.

No difficulty is experienced with the barbette gun carriages, of which four for the 12-inch guns, five for the 10-inch, and seven for the 8-inch are under construction at the Watertown Arsenal, where the adaptation of old barbette carriages to modern ordnance makes good headway. A 12-inch minimum port casemate carriage of German make is soon to be tested, and its acceptance will carry the right to manufacture.

ARSENALS AND ARMORIES.

Ordnance and ordnance supplies for the three branches of the service are manufactured at the six Government arsenals or by contract with private manufacturers. While of necessity each arsenal is engaged in other lines of work to a greater or less extent, the main lines of operation at each have been established as follows:

The Watervliet gun factory is devoted to the manufacture of 8,

10, and 12 inch guns for seacoast defense, of modern rifled, field, and siege artillery, of steel mortars and projectiles. Of the seacoast guns produced here the Board of Ordnance and Fortification says: "For power, for endurance, and for accuracy these guns have justified expectations and proved most serviceable arms, which we need not hesitate to place upon our new fortifications. Other types may be found in the progress of time which excel these, but experimental firings at home or abroad have not yet demonstrated the existence of any better guns."

This establishment is completed according to the original scope of its work, except the large machinery needed for the manufacture of 16-inch guns. Its annual output will exceed original estimates. The cost of guns assembled there has not exceeded estimates, and, with the improvement and perfection of the plant, becomes less.

The Watertown Arsenal is devoted to the remodeling of gun carriages and the manufacture of seacoast carriages. The installation of a modern gun-carriage plant has made good progress during the year. The foundry is completed and additions have more than doubled its capacity.

The Springfield Armory for some years has made the arms for the infantry. Extensive preparations in the erection of new buildings, the establishment of a new power plant, and the readjustment of machinery have been made, and the manufacture of the new .30-caliber magazine rifle is now in progress. During the year 20,761 of the .45-caliber Springfield rod-bayonet rifles and cadet rifles were made.

The Frankford Arsenal produces the ammunition required for artillery and infantry service. Tests and examinations preliminary to the manufacture of ammunition for the new magazine rifle are in progress, but for the present it will be necessary to produce both .45 and .30 caliber cartridges. During the year the chemical laboratory for the examination of powder and explosives has been completed and put into operation.

The Rock Island Arsenal furnishes gun carriages, caissons, and battery wagons for field and siege artillery and equipments for the infantry and light artillery.

The Benicia Arsenal is limited to the needs of the ordnance of the Pacific coast and to tests and experiments with gunpowder to stimulate its manufacture on the Pacific coast.

The Proving Ground at Sandy Hook, New Jersey, is devoted to the test of heavy ordnance, powder, and explosives and projectiles. For manifest reasons its needs will increase with its growing importance.

PRIVATE CONTRACTS.

The policy of the Government has been to obtain all the forgings for heavy guns from private manufacturers, but to assemble and finish the guns itself. This policy has been deviated from to the extent of making private contracts for the following finished guns and mortars:

	Guns.			Mortars (iron), 12-inch.
	8-inch.	10-inch.	12-inch.	
Bethlehem Iron Works	25	50	25	.....
West Point Foundry	11	.....	.....	.....
South Boston Foundry	.....	.....	.....	43
Builders' Foundry, Providence	.....	.....	.....	30
Total	36	50	25	73

Whether this deviation, which was ordered by Congress, shall prove a desirable precedent or not will develop in time, work under the contracts for heavy calibers not having progressed far enough to warrant a positive utterance.

POWDERS AND HIGH EXPLOSIVES.

The invention or reproduction of a powder which shall meet the requirements of the ordnance which the United States are engaged in making, and of a standard smokeless powder for small arms, presents a problem to our powder manufacturers, the solution of which should be profitable to them and a source of pride to the country. The manufacture of such powders is in the experimental stage in the United States, and abroad it has hardly more than passed beyond that stage to one of positive progress. When the lack of such powder shall have been supplied a long step toward self-sufficiency for national defense will have been taken. The tests of powder during the year have not been satisfactory, and the brown powder for the larger caliber of guns, reproduced by our makers from foreign samples, does not admit of any certain anticipation of the results of its trial. Every encouragement has been afforded to manufacturers and inventors, and this Department will continue to afford such encouragement in the belief that American ingenuity is equal to the solution of the problem.

Interesting experiments have been conducted to obtain some high explosive, available as the charge for shells to be thrown by mortars upon the decks of hostile vessels. Ammonite, rackarock, explosive gelatine, wet gun cotton and emmensite have been examined. These

experiments indicate that 100 pounds of emmensite, a moderate charge for a mortar shell, can be thrown by powder with entire safety a distance of six miles, and, exploded in the interior of a ship, would be decisively destructive. Experiments will be continued until present conclusions are corroborated or new ones reached.

The manufacture of projectiles for the various branches and purposes of the artillery service is conducted at Watervliet, Watertown, and Frankford arsenals and by private contract. Contracts have been let for armor-piercing projectiles numbering 248 for the 12-inch guns, 422 for the 10-inch, and 312 for the 8-inch, and the first lots delivered meet requirements. Deck-piercing shells, furnished under contract for the 12-inch mortars, have not yet filled the contract condition, *i. e.*, perforation of a 4.5-inch deck plate, but with experience the desired result will doubtless be reached. The manufacture of projectiles for siege and field artillery equals current requirements and the arsenals have established satisfactory types of shrapnel and can furnish it on demand.

RESULTS ATTAINED.

The magnitude and importance of the work of seacoast defense have entitled the subject to somewhat extended review. The past eight years have been years of reflection, investigation, experiment, preparation, and manufacture. They have given to us a gun factory at the Watervliet Arsenal, West Troy, N. Y., unexcelled in the quality of its work by any in the world, and of a capacity limited, so far as our needs are concerned, only by the wishes of Congress; they have given to us a good number of modern high power guns and mortars, serviceable gun lifts and barbette carriages, the early likelihood of suitable disappearing carriages, some proper emplacements, the necessary projectiles, and an experimental knowledge of brown and smokeless powders for heavy ordnance.

RIVERS AND HARBORS.

The improvement of the harbors and internal waterways of the country, a work of immense consequence to our commerce and general benefit to the people, has made excellent progress under the support of the liberal appropriations voted for that purpose. The Chief of Engineers estimates that in the continuance of these works in accordance with the existing projects as adopted by Congress the sum of $38,770,611 can be expended during the next fiscal year. This estimate has been

transmitted to the Secretary of the Treasury as required by law, but it is not the judgment of the Department that public necessities demand the expenditure of such an amount at this time. The average annual amount actually expended for such work during the last ten years has been about $10,000,000, and it is believed that this can well be reduced for the present year, if judiciously allotted, to $7,500,000, the sum fixed in the Department estimates.

EDUCATION OF THE ARMY.

The Major-General Commanding the Army reports that in the permanent establishment education was never so general or so high as at the present time. The scheme for the higher instruction of officers of the Army is comprehensive and liberal, and on its successful development will depend our ability to keep step with the world's constant progress in the art of war. It embraces:

The school for artillery officers at Fort Monroe, established in 1867.

The school for infantry and cavalry officers, established at Fort Leavenworth in 1881.

The school of drill and practice for cavalry and light artillery at Fort Riley, authorized in 1887.

The school for engineers at Willets Point.

Officers' lyceums, established in all of the geographical departments.

Twenty lieutenants of artillery and a small number of noncommissioned officers are receiving two years' instruction at Fort Monroe, and the commandant of the school reports that its development keeps pace with progress in military knowledge. Its gravest need, modern siege and seacoast guns, will be adequately met in the near future.

Thirty-three officers of infantry and cavalry have completed the two years' course at Fort Leavenworth, and the commandant of the school credits them with attaining exceptional efficiency.

Eleven officers completed the engineering course at Willets Point during the year and four were engaged in the study of operating torpedoes up to October, 1893. All are entitled to certificates of proficiency.

The School of Cavalry and Light Artillery Practice at Fort Riley was not fairly organized and established until January 1, 1893.

Advance has been made toward the objects for which post lyceums were established. The project is as yet in the tentative stage, and it is evident that to make it serve more adequately its purposes the lines

of study and original research must be more closely supervised. The aim of these institutions is to educate the officers of the Army in duties beyond the routine with which they are presumably familiar, to encourage independent military research and render available the results of original thought. It would indeed be strange if the line of the Army should be exceptional in not contributing in time of peace to scientific progress in its special work, when our contributions in time of conflict to skillful and effective warfare on sea and land have won the world's recognition and when our contributions to the arts of peace are everywhere acknowledged. Original papers submitted during the year covered the widest range of topics, and concentration of thought on fewer themes is desirable.

During the past year the division of military information has begun systematic work which promises to be of great utility to the Army and to the War Department. Its labors have been assigned to four sections.

The first section undertakes to keep record of the progress of military art abroad through our military attachés abroad, the diplomatic and consular service, and official documents of foreign governments and foreign military publications.

The second section undertakes to collect information relating to our own frontiers.

The third section will endeavor to collect military information concerning all other countries and islands of this continent.

The fourth section is seeking information concerning the militia of the several States and its availability for service.

The great armies of the world are to-day officered by students of the military art, and the relatively short duration of the world's great wars since our civil war demonstrates that warfare is becoming an art dependent on the exact sciences quite as much as on personal bravery We shall never want men and money in emergency, but the ability to use them effectively can come only through the study of the officers of the staff and line of the Army. Progress in the War Department must be along the lines of a national university of military science as well as along those of coast defense.

THE MILITARY ACADEMY.

The Superintendent of the United States Military Academy at West Point reports that on September 1, 1893, the cadets numbered 318, including three foreigners admitted by special permission of Congress. As the number of cadets authorized by law is 371, not including foreigners, there are 56 vacancies. In the judgment of the superintendent the number of cadets should be increased by the admission of two cadets-at-large from each State, to be chosen by the United States Senators of the State. That at an early day there must be an increase in the number of cadets undergoing military instruction at West Point is obvious from the technical nature of modern warfare, its demands for men of a high order of scientific attainments, and the progress of the United States in the military art. The coöperation of the Federal Government with the States in furnishing instruction to the militia and with colleges and schools in furnishing it to the youth of the land will presumably be extended from time to time, and the conduct of our comprehensive system of seacoast defenses, the beginnings of which are assuming definite form, will soon call for a supply of educated young officers larger than the Military Academy now furnishes.

The recommendation of the Superintendent for the repeal of the statutes prohibiting the employment of a graduate as instructor at the Academy until four years after graduation would doubtless aid efficient instruction. The custom, which is forbidden by statute to the Academy, is general in the universities and colleges of the highest rank in the country and has been the means of developing independent research and original study in many directions to the country's great gain. There is no reason to doubt that its effect would be the same at the Military Academy. The Army and the country can be served under present conditions as effectively by the West Point graduate in the mathematical study or laboratory as in the field.

The Board of Visitors to the Military Academy reports that the education afforded there is "mercilessly genuine." The exercises of the cadets in infantry, artillery, cavalry, and practical military engineering were remarkable exhibitions of efficiency and skill, scarcely susceptible of criticism. The scientific gymnasium work and the "large manliness and deep-seated courtesy, patriotic fervor and loyal adherence to truth and honor" of the cadet corps receive a generous meed of praise, and the corps of instructors and administrative officers

are warmly commended. The Board strongly recommends a gradual increase in the number of cadets, and that the requirements for admission be raised to secure young men of the training and mental scope to get the fullest benefit from intellectual resources offered to them.

MILITARY SCHOOLS AND COLLEGES.

The growth of popular interest in the endeavors of the War Department to furnish competent military instruction to universities, colleges, academies, and schools entitled under the law to its benefits, has been encouraging. The whole number of students capable of military duty at institutions to which the Government furnishes military instructors has increased from 12,301 in 1890–'91 to 17,519 in 1892–'93, a gain of 42 per cent, and the number that received military instruction has increased from 7,366 during the last quarter of 1890–'91, to 10,790 for the last quarter of 1892–'93, a gain of 47 per cent. Outside of the colleges and schools receiving instruction from the Army, many educational institutions furnish their students with instruction in drill and tactics by officers of the militia, so that the total of young men receiving military training of some description is much larger than indicated in the statistics given.

Of the 79 institutions embraced in the report of the Adjutant-General, 31 report less than 100 students under military instruction, though in some of these the attendance on the scholastic course is several hundred. While it would work injustice to lay down a hard and fast rule, prescribing in any institution an enrollment for military instruction of at least 100 students as a condition to the assignment of an Army officer as instructor, in general it may be well to require a very high percentage of attendance at drills from institutions enrolling less than 100 students for military instruction. Where the interest of faculty and students is too slight to secure this, the Government is doubtless wasting the valuable time of its officers and needlessly spending money.

I concur in the recommendation of the Adjutant-General that the military instruction now provided for colleges might well be extended, with proper limitations, to the high schools of our large cities. The introduction of military training into the free-school system of the States should stimulate patriotism, of which that system is one of the best products, and should in time become a most potent factor in making the United States, not a warlike nation, but a nation capable of

bearing arms intelligently and victoriously under all conditions. The Major-General Commanding the Army expresses the disposition of the Army in these words:

> The demand for educated officers for duty at colleges and universities and other institutions of learning is constantly increasing, and no better service could be rendered in time of peace by officers of the Army than such assistance in the general dissemination of military instruction.

THE SIGNAL CORPS.

Those branches of the service which exact a considerable degree of scientific or mechanical proficiency, to be acquired only after long study or practice, are especially entitled to the favorable consideration of the Government, and attention is called particularly to the report of the Chief Signal Officer. The Signal Corps from 33 military posts and stations now operates about 700 miles of permanent telegraph lines, which are also used in part for commercial purposes. Flying telegraph trains for experimental purposes are in course of organization, and the practical value of these was demonstrated during military operations on the Mexican border.

Some work has been done with the heliograph. The balloon has taken its place in the mechanism of war, and the Signal Corps has given to it such study as appropriations have permitted. Two hundred and eighty-eight officers and 1,388 men are reported proficient in military signaling, but of these only one in six can take telegraphic messages at a low rate of speed. Telegraphy and the signal code are interesting studies in themselves, and it is worth recording that Army officers and enlisted men are devoting time to them as recreation, and that in the national guard of several of the States and in some military schools these subjects have been embraced in the scheme of instruction. The Chief Signal Officer recommends various extensions in the field of operations of the corps, which are entitled to consideration.

THE MILITIA.

The militia of the States constitutes the second or reserve line of national defense, besides serving the purposes for which it is established by State authority. Its importance in any scheme for national protection becomes plain when it is borne in mind that, while the Army consists by law of only 25,000 men, nearly 90,000 men would be required to garrison our fortifications in case of emergency, and with the ampli-

fication of those fortifications in progress an even larger number would be required. The obligation of the Federal Government to the militia of the States is twofold—to furnish instruction and inspection and to furnish ordnance supplies—both having in view the establishment of a sufficient uniformity of discipline and equipment to enable the militia to coöperate promptly and effectively with the Army should occasion demand. The second obligation was recognized by Congress as early as 1808, when an act was passed allotting $200,000 to the militia of the States.

In spite of the increase in population, increase of the militia, and improvements and increased cost of arms, artillery and equipments, the appropriation remains virtually fixed at the original amount, the endeavor of Congress to increase it by the act of February 12, 1887, failing to accomplish that result. The requests for the coöperation and assistance of the Federal Government from the States are greater now than ever in times of peace, and manifestly are the index of an intelligent interest in the nation's military growth and progress, which is entitled to reciprocal manifestations of interest by the Federal Government and by Congress. The Major-General Commanding the Army advises that the most improved infantry rifles and the standard breech-loading field guns be issued to the organized militia. Some time must elapse before the output of the new magazine rifle is large enough to provide for its issue to the militia, but the continued issue of the new field guns will stimulate interest in the artillery arm of the national guard, which is desirable.

During the year 1892 twenty-five Army officers were detailed to inspect the encampments and drills of the militia of twenty States, aggregating 36,207 enrolled men. During 1893 sixteen officers inspected the camps and drills of the militia of fourteen States, and the Army participated in several State encampments.

The latest returns of the strength of the militia, received at this Department, show a total organized force of 112,597 officers and enlisted men. The artillery arm, maintained by thirty-four States, has an enrollment in round numbers of 6,000 officers and men; the cavalry

arm maintained by twenty-four States of 5,000. The geographical distribution of this force follows:

State.	Organized force.	State.	Organized force.
Alabama	2,719	Montana	592
Alaska Territory	.....	Nebraska	1,366
Arizona Territory	293	Nevada	566
Arkansas	911	New Hampshire	1,265
California	4,198	New Jersey	4,017
Colorado	901	New Mexico Territory	571
Connecticut	2,735	New York	13,500
Delaware	443	North Carolina	1,577
District of Columbia	1,382	North Dakota	513
Florida	902	Ohio	6,551
Georgia	3,949	Oklahoma Territory	154
Idaho	229	Oregon	1,406
Illinois	4,774	Pennsylvania	8,497
Indian Territory	.....	Rhode Island	1,040
Indiana	2,654	South Carolina	5,119
Iowa	2,363	South Dakota	584
Kansas	1,714	Tennessee	1,029
Kentucky	1,227	Texas	3,229
Louisiana	1,187	Utah Territory	1,066
Maine	1,208	Vermont	706
Maryland	2,334	Virginia	2,844
Massachusetts	6,174	Washington	1,388
Michigan	2,943	West Virginia	864
Minnesota	1,861	Wisconsin	2,676
Mississippi	1,712	Wyoming	309
Missouri	2,355	Total	112,597

THE SOLDIERS' HOME.

The annual report of the president of the Board of Commissioners of the Soldiers' Home at Washington shows 1,080 inmates on the rolls of that institution on September 30, 1893, the average attendance being 751. The permanent fund of the Home has been reduced $10,000 by excess of expenditures over receipts, and at the date of the report was $2,479,343.32. Of $96,287.47 received by the treasurer for inmate pensioners, all but $372.19 was paid to the individual pensioners. In this connection the report states:

The Commissioners are of the opinion that Congress never intended to make the double provision now fully enjoyed by many of the inmate pensioners who are comfortably lodged, fed, and clothed at the expense of the Home while they draw their pensions, in some cases amounting to $36 per month, and spend it without being taxed in the slightest degree for their support. This makes the Home a standing inducement for pensioners to seek admission thereto, and while it is just and proper that men disabled in the service should be pensioned according to the degree of disa-

bility incurred, it is believed to be also proper that pensioners receiving more than $8 per month should be required to pay partly at least for their support. * * * To show how far pensioners have availed themselves of the benefits of the Home it is stated in the Governor's report that of the 710 inmates now present, 584 are drawing pensions as follows: 151 are receiving from $16 to $36 per month; 274 from $10 to $15, and 159 from $2 to $8.

NATIONAL HOME FOR DISABLED VOLUNTEERS.

The act of March 3, 1891, making appropriations for the support of the National Home for Disabled Volunteer Soldiers, provides that the expenditures and receipts of said home from whatever source shall be reported to and supervised by the Secretary of War, and the deficiency act of March 3, 1893, requires the supervision of those accounts to be the same as that of accounts of disbursing officers. The appropriation account of this institution and its branches shows:

Balance in treasury, July 1, 1892	$201,561.59
Amount of appropriations	3,321,098.05
Unexpended balances deposited	99,780.78
	$3,622,440.42
Withdrawn by requisitions	3,286,535.41
Balance	$335,905.01

The vouchers submitted through the War Department to the Treasury cover disbursements and receipts only on account of the "general fund;" but the annual report of the Board of Managers shows that other funds, known as the posthumous fund, post fund, and pension fund, aggregating over $2,500,000 for the last fiscal year, are kept at the branch homes.

In response to inquiry the War Department is informed by the president of the National Home for Disabled Volunteers that the pension fund of the Home for the fiscal year was $2,574,055.48, of which $1,756,428.05 was disbursed to pensioned inmates of the Home and its branches, and $535,883.22 to their families. Of the inmates of the Home 14,481 receive pensions from the Government ranging from $2 to $72 a month. Of these 5,560 receive $8 or less a month, 2,842 being rated at the maximum named; 774 receive $10, 6,828 receive $12, and 1,301 receive over $12 up to $72 per month.

Quotation has already been made from the report of the president of the Board of Commissioners of the Soldiers' Home, the Major-General Commanding the Army, proposing that pensioners receiving more than $8 per month, who are inmates of the Home, shall be required to

make some contribution toward their support. Without a review here of the argument concerning this double system of pensions, for it amounts to that, it is pertinent to inquire if it does not apply, as a matter of justice, with as much force to the Home for Disabled Volunteers as to the Soldiers' Home.

THE WORLD'S COLUMBIAN EXPOSITION.

In the dedicatory exercises of the World's Columbian Exposition at Chicago the Army was represented by twenty-four companies of infantry, ten troops of cavalry, and four light batteries. These, with a battalion of marines and 12,271 officers and men of the national guard of eight States, were under command of the major-general commanding the Department of the Missouri, who reports that the troops presented a creditable appearance, were well equipped, and marched and maneuvered with commendable skill and precision.

A camp of two companies of infantry, established for the entire duration of the Exposition, illustrated on a small scale the discipline, mode of operations and life of the Army, and served as a guard to Government property. The visit of the corps of cadets from the Military Academy was appreciated evidence of the interest of this Department in the success of the Exposition, and, it is believed, gave the corps valuable information and experience, while tending also to increase the popular affection for the institution. The sum of $124,887 was allotted to the exhibit of the War Department, and after all payments have been made a balance of about $8,000 will remain unexpended.

The Department exhibit comprised modern seacoast, siege and field ordnance, rapid-fire and machine guns, small arms, cartridge, gun making, testing and other machines in operation, ballistic, aiming, measuring and other instruments of precision, models of fortifications and seacoast defenses, surgical exhibits, army supplies, photographs of river and harbor improvements and public works in the District of Columbia, military relics, trophies, etc., constituting a record to the eye of the products of American military inventive and mechanical genius which awakened general interest. Twenty-one officers were on duty at the Exposition, and many others visited it on leave. What the Army obtained from and gave to the Exposition is thus of educational value.

AN ARLINGTON MEMORIAL BRIDGE.

The need of increased transportation facilities between the seat of Government and the Virginia shore has long been recognized, but has not been met. Another bridge across the Potomac from Washington to Potomac Heights is required for the ordinary purposes of travel and commerce, to render speedily accessible the principal military post of the Capital, Fort Myer, and, above all, as a convenient and suitable approach from the city to the National Cemetery at Arlington.

While serving purposes of utility and conceded necessity, such a structure would be of memorial character, befitting the beautiful and sacred ground to which it would lead, and in ultimate decoration symbolizing valor, devotion to conviction, self-sacrifice, and all the marked qualities of the nation, displayed in strong lights and shadows on both sides of the Potomac. Nature and man have joined to create here the surroundings to make such a memorial structure unique and impressive. Seldom is conceded commercial necessity so reinforced by considerations of patriotism and reverence in support of a desirable public improvement.

NATIONAL CEMETERIES.

The national cemeteries now number 83, and to continue the work of marking the graves therein 9,168 white marble headstones were provided during the year, and $6,122.34 was expended on repairs to roadways.

GETTYSBURG BATTLEFIELD.

The work of preserving the lines of battle at Gettysburg and of permanently marking the position of the commands of both armies there engaged is making satisfactory progress under the direction of the commission appointed for its supervision.

Title papers for the purchase of sites occupied by the regular troops are nearly perfected, and the positions will soon be suitably marked.

The State monument erected by New York was dedicated July 2, 1893, the 30th anniversary of the battle.

In addition to the considerable sums expended for the preservation of points of historic interest in connection with this field by the Gettysburg Battlefield Memorial Association and other organizations and individuals, the sum of $863,017.82 has been contributed to the work by States whose soldiers participated in the battle. This large outlay has been expended under the supervision of the Association mentioned,

in the purchase of plots of land embracing the leading features of the battlefield, the construction of connecting roads and avenues, and the erection of suitable monuments and tablets. In the absence of any other provision for the permanent care and maintenance of this completed work it has been suggested that the General Government might well accept that charge and assume its control.

CHICKAMAUGA AND CHATTANOOGA PARK.

During the year the greater part of the costliest work connected with the establishment of the Chickamauga and Chattanooga National Military Park has been completed. The total amount expended was, on the 30th of September last, $401,485.63, and the available balance was $173,514.37. Between 9 and 10 square miles of the Chickamauga battlefield have been acquired and paid for, and several prominent points near Chattanooga, including Bragg's headquarters upon Missionary Ridge, the De Long Place, and Orchard Knob have been secured. Title to Sherman's earthworks will soon be perfected. Except a few hundred acres the purchase of land for the park proper is complete, and the area which the Commission has concluded to embrace is fully 2,000 acres below the limits fixed by Congress. Twenty-five miles of good roadway have been completed and historical tablets designate prominent points, the landmarks and headquarters of the battle.

The work of restoring the field to its condition at the time of the battle has progressed rapidly. Seventeen State commissions have been organized to locate the positions of State troops, and the national commission expects that the remaining nine States which had troops engaged in the battle will create commissions during the coming winter. Several State commissions have already visited the park and established the positions of the troops of their respective States. Ohio has appropriated $95,000 for monuments, fifty-six of which will soon be erected; Minnesota has appropriated $15,000 for five monuments, and during the coming session legislatures of other States are expected to take similar action. Seven granite monuments have been erected in memory of the regular troops engaged at Chickamauga, and five observation towers have been erected, offering comprehensive views of the field of conflict.

MONUMENTS.

The commission appointed by Congress to select a site and supervise the erection of a statue to the late Maj. Gen. John A. Logan, acting in conjunction with a committee representing the Society of the Army of the Tennessee, has adopted a model of a bronze equestrian statue and pedestal. The total cost of the statue, including pedestal, foundation, and base, will be $65,000, of which the sum of $15,000 is to be raised by contributions from other sources.

The commission appointed to select a site and supervise the erection of the pedestal for a statue of the late Gen. Philip H. Sheridan has selected as a suitable site the small plat of ground at the intersection of Pennsylvania avenue and E street NW. Definite action in regard to the statue has been deferred to await the result of efforts to increase by private subscription the amount appropriated by Congress.

It has been found necessary to abandon the site originally selected for the proposed statue of the late Maj. Gen. W. S. Hancock, at the junction of Sixteenth and U streets and New Hampshire avenue, known as "Hancock Circle," and the commission will not enter into any contract for the erection of the statue until a new site has been selected.

An act of Congress approved July 5, 1892, appropriated the sum of $50,000 for the preparation of a site and the erection of a pedestal for a statue of the late Gen. W. T. Sherman, but no action in the matter has yet been taken, pending the selection of a site.

RECORD AND PENSION OFFICE.

The work of the Record and Pension Office has progressed so far that a reduction of $345,000 has been made in the estimate for its maintenance for the coming year.

The cases received and disposed of for the fiscal year numbered 203,704, of which 137,563 were from the Pension Office. The bulk of pension claims arising under the act of June 27, 1890, has apparently been filed and the reports of military service furnished. Under the recent ruling of the Interior Department, however, very many of the claims under that act will again be referred to this office for the full medical and military history of the claimants, and as more comprehensive reports are required, the work of this office for the time will be considerably increased. The reproduction of individual military records of volunteer officers and men by the index-card system is now

practically completed. The reproduction of the volunteer rolls of the veteran reserve, United States volunteers, post, detachment, and miscellaneous rolls will remain to complete this work. From the total of 35,099,755 index-record cards on file, the record of any soldier can readily be ascertained. The usefulness of the system is generally conceded.

Concerning the calamity on the 9th of June last at the Ford's Theatre building on Tenth street, occupied by the Record and Pension Office, and in which twenty-two clerks were killed and a large number seriously injured, the chief of that office in his annual report says:

The building was an old one, but had been repeatedly examined by experts and pronounced entirely safe. It was purchased by the Government in 1866, was entirely remodeled and has since been used by the War Department for various purposes, principally for the storage of the Army Medical Museum, the library of the Surgeon-General's Office, the medical records of the Army, and the accommodation of the officers and clerks employed in connection therewith. Sometime after the building came into the possession of the Government a considerable expenditure was made upon it in the way of thoroughly strengthening its walls, and for many years subsequently its floors bore with perfect safety the immense weight of the museum, library, and hospital records, but all of these had been removed from the building several years before the catastrophe occurred. As the weight of the clerks employed in the building was many times less than that removed therefrom, there was no ground for apprehension that the building was not a safe one for the purpose for which it has latterly been used, viz, for office purposes for the use of clerks and the storage of the few records upon which they were at the time engaged in copying.

For the comfort and convenience of the clerks so employed it became desirable to supply the building with electric lights and ventilating fans, and for this purpose an excavation was made under the building by a contractor to whom this necessary part of the work had been entrusted. This work included the underpinning of certain piers upon which the floors, in part, rested, and it was during the progress of this work, and probably in consequence of it, that the disaster occurred. In a substantial building, as this was known to be, and under the superintendence of a competent builder, there was no reason to believe that the work was not entirely safe and free from danger to the persons occupying the building at the time. That the confidence felt in the safety of the building during the progress of this work was not well founded is shown by the unfortunate results that followed. The families of some of the killed in this most deplorable accident are understood to be in a destitute condition, and the widows and orphans of those whose lives were thus sacrificed in the public service, and those who were seriously injured, are earnestly commended to the generosity of the Government.

In this recommendation the Secretary of War earnestly concurs.

The Department has extended to the employés who were injured the most liberal consideration which the law permits, but under the

recent opinion of the Attorney-General sick leaves with pay can not be granted for a longer period than sixty days in any one year.

It is recommended that Congress authorize payment to them of the full amount of their salaries during such periods as they may be unable, by reason of their injuries, to return to duty, unless it shall in the mean time make specific provision for them by direct appropriation. The payment of their salaries during the period of their enforced absence would require no additional appropriation, the full amount of such salaries for the current year having already been appropriated by the legislative, executive, and judicial appropriation act.

WAR RECORDS.

The publication of the War Records has so far progressed that this valuable historical work, with accompanying maps, can be completed by the end of the next fiscal year, and satisfactory progress has been made in the work of indexing the Confederate archives.

By the retirement of Brig. Gen. Robert Williams, Adjutant-General of the Army, the War Department has been deprived of the services of an intelligent, competent officer and accomplished gentleman, to whose worth and usefulness I bear willing testimony. I desire also to place on record my appreciation of the cordial coöperation and prompt assistance of the Major-General Commanding the Army and of the heads of the several bureaus of the Department in the administration of affairs intrusted to the supervision of the Secretary of War.

DANIEL S. LAMONT,
Secretary of War.

APPENDIX.

1893.

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1893, showing the amount appropriated under each title of appropriation, the amount drawn by requisition upon the Treasury, and the balances subject to requisition July 1, 1893.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892, to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
SALARIES, CONTINGENCIES, ETC.							
Salaries, office of—							
Secretary of War	$4,874.61	$106,550.00		$111,424.61	$105,746.92	$3,409.61	$2,268.08
Adjutant-General	2,726.78	212,920.00		215,646.78	211,350.62	2,131.78	2,164.38
Inspector-General	438.38	9,320.00		9,758.38	9,297.71	438.38	22.29
Judge-Advocate General	249.74	14,860.00		15,109.74	14,788.86	246.53	74.35
Quartermaster-General	3,352.06	158,940.00		162,292.06	156,394.02	1,272.06	4,625.98
Commissary-General	991.06	42,760.00		43,751.06	42,502.65	945.64	302.77
Surgeon-General	2,570.57	186,472.45		189,043.02	185,876.93	1,630.57	1,535.52
Paymaster-General	79.10	39,160.00		39,239.10	39,156.13	79.10	3.87
Chief of Ordnance	135.18	44,860.00		44,995.18	44,813.71	39.03	142.44
Chief of Engineers	423.34	23,240.00		23,663.34	23,160.89	335.79	166.66
Publication of Records of the Rebellion	2,410.51	31,780.00		34,190.51	31,201.98	1,990.51	998.02
Salaries, Signal Office	2,114.02	5,700.00		7,814.02	5,700.00	2,114.02	
Salaries, Record and Pension Office, War Department	42,836.37	1,009,390.00		1,052,226.37	983,715.81	33,516.37	34,994.19
Salaries of employés, public buildings and grounds, under Chief Engineer	21.20	49,060.00		49,081.20	49,010.21	21.20	49.79
Contingent expenses, public buildings and grounds, under Chief Engineer	.80	500.00		500.80	491.71	.80	8.29
Disposal of useless papers, War Department	71.20			71.20		71.20	
Contingent expenses, War Department	28.06	55,000.00		55,028.06	48,202.96	28.06	6,797.04
Postage, Postal Union countries, War Department	1,235.00	1,000.00		2,235.00	810.00	375.00	1,050.00
Stationery, War Department	1,562.08	35,000.00		36,562.08	33,860.85	.93	2,700.30
Rent of buildings, War Department	500.00	6,600.00		7,100.00	6,499.99	400.00	200.01
Total salaries, contingent expenses, and postage	66,620.06	2,033,112.45		2,099,732.51	1,992,581.95	49,046.58	58,103.98
MILITARY ESTABLISHMENT.							
Expenses of Commanding General's office		1,750.00		1,750.00	1,750.00		
Expenses of recruiting	51,108.71	130,000.00		181,108.71	120,515.87	38,853.72	21,739.12
Contingencies of the Adjutant-General's Department	63.88			63.88		63.88	
Contingencies, headquarters of military departments		3,000.00		3,000.00	2,939.48		60.52
Contingencies of Inspector-General's Department			$12.00	12.00		12.00	
Contingencies of the Army	2,725.51	15,562.10		18,287.61	12,674.76	304.57	5,308.28
Signal Service of the Army	13.74	22,000.00		22,013.74	20,816.09	588.10	609.55
Pay, etc., of the Army	492,348.40	13,352,682.85		13,845,031.25	12,458,220.87	186,623.81	1,200,286.57
Subsistence of the Army	259,659.15	1,700,436.55		1,960,095.70	1,608,306.37	211,714.74	140,074.59
Regular supplies, Quartermaster's Department	563,075.31	2,580,604.12		3,143,679.43	2,240,976.70	322,332.97	580,369.76
Incidental expenses, Quartermaster's Department	48,530.92	659,629.46		708,160.38	632,132.13	14,981.53	61,046.72
Barracks and quarters	75,043.02	701,080.09		276,123.11	683,402.04	2,971.85	89,749.22
Barracks and quarters, Fort Myer, Va.	7.00			7.00		7.00	

Transportation of the Army and its supplies	778,286.00	2,849,846.35		3,628,132.35	2,735,543.22	174,520.86	718,068.27
Transportation of the Army and its supplies, Pacific railroads		260,930.30		260,930.30	260,930.30		
Fifty per centum of arrears of army transportation due certain land-grant railroads		3,103.72		3,103.72	3,103.72		
Horses for cavalry and artillery	69,554.07	135,580.25		205,134.32	125,101.79	23,017.66	57,014.87
Construction and repair of hospitals	13,400.16	51,571.25		64,971.41	63,064.28		1,907.13
Quarters for hospital stewards	1,828.38	7,000.00		8,828.38	6,988.84	541.44	1,298.10
Shooting galleries and ranges	4,727.42	8,000.00		12,727.42	7,820.91	4,699.01	207.50
Purchase of land for target ranges, Fort McPherson, Ga	16,500.00			16,500.00			16,500.00
Rifle range, Fort Sheridan, Ill	8.83	90.00		98.83	90.00	8.83	
Bellevue rifle range, Omaha, Nebr		500.00		500.00			500.00
Clothing and camp and garrison equipage	141,138.17	1,200,017.50		1,341,155.67	1,074,078.58	9,737.10	257,339.99
Medical and hospital department	45,859.03	171,945.35		217,804.38	163,131.18	34,719.37	19,953.83
Army and Navy hospital, Hot Springs, Ark		7,960.60		7,960.60	7,960.60		
Army Medical Museum	153.55	5,000.00		5,153.55	5,152.90	.65	
Library, Surgeon-General's Office	485.04	7,000.00		7,485.04	7,485.04		
Engineer depot at Willets Point, N. Y	2,952.50	15,000.00		17,952.50	15,246.75	2.50	2,703.25
Ordnance stores, etc	330.20	390,000.00		390,330.20	389,638.24	126.37	565.59
Ordnance service	68.01	80,000.00		80,068.01	79,978.22	79.53	10.26
Ordnance material, proceeds of sales	400,644.67	6,819.67		407,464.34	62,731.29		344,733.05
Manufacture of arms	76,143.10	400,000.00		476,143.10	302,121.81		174,021.29
Hotchkiss gun for Military Academy	87.67			87.67			87.67
Maxim gun, etc., for Military Academy		2,870.00		2,870.00	2,870.00		
Pay of Military Academy	46,890.65	230,890.08		277,780.73	200,004.12	23,370.43	54,406.18
Current and ordinary expenses, Military Academy	5.75	70,981.25		70,987.00	63,405.19	3,154.94	4,426.87
Miscellaneous items and incidental expenses, Military Academy	7.30	22,020.00		22,027.30	19,659.06	1,893.56	474.68
Total military establishment	3,091,646.14	25,093,871.49	12.00	28,185,529.63	23,377,840.35	1,054,226.42	3,753,462.86
Repayments in excess of payments					12.00		
Actual expenditures					23,377,828.35		
PUBLIC WORKS.							
Buildings and grounds, Military Academy.							
Buildings and grounds, Military Academy		114,646.00		114,646.00	67,634.40	453.68	46,557.92
New academic building	402,520.19			402,520.19	79,300.00		323,220.19
Total buildings and grounds, Military Academy	402,520.19	114,646.00		517,166.19	146,934.40	453.68	369,778.11
Arsenals.							
Rock Island Bridge, Rock Island, Ill	7,529.92	62,750.00		70,279.92	62,750.00		7,529.92
Rock Island Arsenal, Rock Island, Ill	12,325.29	16,000.00		28,325.29	28,325.29		
Columbia Arsenal Columbia, Tenn		11,500.00		11,500.00	11,500.00		
Springfield Arsenal, Springfield, Mass	90,055.92	10,000.00		100,055.92	67,909.00		32,146.92
Army gun factory, Watervliet Arsenal, West Troy, N. Y	588,701.01			588,701.01	494,841.98		93,859.03
Watervliet Arsenal, West Troy, N. Y	3,370.00	25,000.00		28,370.00	25,000.00		3,370.00
Indianapolis Arsenal, Indianapolis, Ind	1,340.44			1,340.44	1,340.44		
Watertown Arsenal, Watertown, Mass		160,400.00		160,400.00	109,400.00		51,000.00
Benicia Arsenal, Benicia, Cal		2,050.00		2,050.00	2,050.00		

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1893, etc.—Continued.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892, to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
PUBLIC WORKS—continued.							
Arsenals—Continued.							
Frankford Arsenal, Philadelphia, Pa		$5,000.00		$5,000.00	$5,000.00		
Repairs of arsenals	$3.08	50,000.00		50,003.08	49,953.21	$3.08	$46.79
Testing machine		10,000.00		10,000.00	10,000.00		
Powder depot, Dover, N. J	19,299.92			19,299.92			19,299.92
Proving ground, Sandy Hook, N. J	5,225.24	91,376.00		96,601.24	89,010.40		7,590.84
Total arsenals	727,850.82	444,076.00		1,171,926.82	957,080.32	3.08	214,843.42
Fortifications.							
Construction of a counterpoise battery	37,400.00			37,400.00			37,400.00
Artesian well, Fortress Monroe, Va	6,000.00			6,000.00			6,000.00
Armament of fortifications	3,408,391.76	1,194,500.00		4,602,891.76	1,586,234.82		3,016,656.94
Preservation and repair of fortifications	17,884.83	60,000.00		77,884.83	51,680.37	1,000.00	25,204.46
Board on Pacific coast gun factory		2,500.00		2,500.00			2,500.00
Machine guns	322.80	20,000.00		20,322.80		155.20	20,167.60
Mountain guns	16,000.00			16,000.00	15,778.50		221.50
Board of ordnance and fortification	115,101.46	210,000.00		325,101.46	24,811.47		300,289.99
Board on fortifications or other defenses	28,470.77			28,470.77			28,470.77
Board on army gun factories	2,907.40			2,907.40		2,907.40	
Plans for fortifications	900.00	5,000.00		5,900.00	5,100.00		800.00
Torpedoes for harbor defense	382,184.88			382,184.88	105,619.18		276,565.70
Torpedo howitzers	15,000.00			15,000.00			15,000.00
Pneumatic dynamite guns	587,361.45			587,361.45			587,361.45
Sea walls and embankments	7,750.25			7,750.25	3,000.00		4,750.25
Ammunition for morning and evening gun	17,443.63	20,600.00		38,043.63	38,043.50		.13
Purchase of sites for seacoast defenses	100.28			100.28			100.28
Sites for fortifications and seacoast defenses	159,861.87	500,000.00		659,861.87	633,738.97		26,122.90
Gun and mortar batteries	1,024,453.83	500,000.00		1,524,453.83	730,000.00		794,453.83
Artillery targets	2,428.71	5,000.00		7,428.71	4,999.28		2,429.43
Sea wall, Governors Island, New York Harbor	7,000.00			7,000.00	6,702.06		297.94
Powder and projectiles, proceeds of sales	4,234.00	4,507.08		8,741.08	3.86		8,737.22
Contingencies of fortifications		429.19		429.19	429.19		
Total fortifications	5,841,197.92	2,522,536.27		8,363,734.19	3,206,141.20	4,062.60	5,153,530.39
Buildings and grounds in and around Washington.							
Improvement and care of public grounds	463.89	52,950.00		53,413.89	52,528.91	463.89	421.09

Repairs, fuel, etc., Executive Mansion	27.32	30,000.00		30,027.32	29,971.93	27.32	28.07
Lighting, etc., Executive Mansion		15,022.00		15,022.00	14,871.44	124.12	26.44
Repairs to water pipes and fire plugs	66.58	2,500.00		2,566.58	2,486.30	66.58	13.70
Telegraph to connect the Capitol with the Departments and the Government Printing Office	1.02	1,500.00		1,501.02	1,500.00	1.02	
Water supply, Executive Mansion	5,300.00			5,300.00			5,300.00
Building for State, War, and Navy Departments	50,018.81		$335.31	50,354.12			50,354.12
Increasing the water supply of Washington, D. C	429,723.01			429,723.01	737.47		428,985.54
Erection of fishways at Great Falls		15,000.00		15,000.00	15,000.00		
Building for Army Medical Museum and Library	1,235.30			1,235.30		1,235.30	
Water supply, District of Columbia	10,669.91			10,669.91			10,669.91
Care and maintenance of the Washington Monument	.44	11,520.00		11,520.44	11,197.34	.44	322.66
Total buildings and grounds in and around Washington	497,506.28	128,492.00	335.31	626,333.59	128,293.39	1,918.67	496,121.53
Repayments in excess of payments					335.31		
Actual expenditures					127,958.08		
Military posts.							
Military storehouse, Omaha, Nebr		30,000.00		30,000.00			30,000.00
Transfer of school site, Fort McClary military reservation, Maine		900.00		900.00			900.00
Purchase of Fort Brown reservation, Texas	160,000.00			160,000.00			160,000.00
Wharf at Fortress Monroe, Va	28,340.80			28,340.80			28,340.80
Bridge over Mill Creek, Fortress Monroe, Va	115.78			115.78			115.78
Sewerage system, Fortress Monroe, Va	24,902.10			24,902.10			24,902.10
Military posts	281,603.30	400,000.00		681,603.30	355,001.75		326,601.55
Officers' quarters, military post at Columbus, Ohio	471.90			471.90			471.90
Military post—							
Fort Sidney, Nebr	15,004.86			15,004.86			15,004.86
Near Newport, Ky. (site)	138.05			138.05		138.05	
Near Newport, Ky. (buildings)	13,339.51			13,339.51			13,339.51
Near Denver, Colo	5.83			5.83		5.83	
Atlanta, Ga	75,000.00			75,000.00			75,000.00
Near Chicago, Ill	346.66			346.66		346.66	
Fort Snelling, Minn	15,000.00			15,000.00			15,000.00
Helena, Mont	100,000.00			100,000.00			100,000.00
Plattsburg, N. Y	200,000.00			200,000.00	25,150.00		174,850.00
Eagle Pass, Tex. (site)	20,000.00			20,000.00			20,000.00
Fort Omaha, Nebr	98,733.54			98,733.54	27,000.00		71,733.54
Fort Bliss, Tex	144,549.31			144,549.31	143,720.00		829.31
Purchase of buildings at military posts	9,727.48		250.00	9,977.48			9,977.48
Improvement of Yellowstone National Park	518.98	45,000.00		45,518.98	44,801.40		717.58
Chickamauga and Chattanooga National Park	138,929.08	150,000.00		288,929.08	191,760.83		97,168.25
Total military posts	1,326,727.18	625,900.00	250.00	1,952,877.18	787,433.98	490.54	1,164,952.66
Repayments in excess of payments					250.00		
Actual expenditures					787,183.98		

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1893, etc.—Continued.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892, to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Improving harbor at—							
Erie, Pa	$36,286.62	$40,000.00		$76,286.62	$20,000.00		$56,286.62
Marcus Hook, Pa	5,000.00			5,000.00	2,000.00		3,000.00
Ice harbor at—							
New Castle, Del	3,583.00			3,583.00			3,583.00
Reedy Island, Del	16,236.93			16,236.93			16,236.93
Improving harbor at—							
Delaware Breakwater, Del		50,000.00		50,000.00	50,000.00		
Wilmington, Del	2,000.00	40,000.00		42,000.00	22,000.00		20,000.00
Removing obstructions from the harbor at Delaware Breakwater, Del	738.08			738.08			738.08
Improving harbor at—							
Baltimore, Md		208,000.00		208,000.00	208,000.00		
Annapolis, Md	1,524.58			1,524.58			1,524.58
Cambridge, Md	5,000.00	7,737.00		12,737.00	3,000.00		9,737.00
Cape Charles City, Va		10,000.00		10,000.00			10,000.00
Norfolk, Va	4,000.00	150,000.00		154,000.00	154,000.00		
Onancock, Va		6,511.00		6,511.00			6,511.00
Beaufort, N. C	4,900.00	10,000.00		14,900.00	2,500.00		12,400.00
Improving Edenton Bay, N. C	2,447.41			2,447.41			2,447.41
Improving waterway between Newberne and Beaufort, N. C	7,477.00			7,477.00			7,477.00
Improving waterway between Beaufort Harbor and New River, N. C		10,000.00		10,000.00	500.00		9,500.00
Improving harbor at—							
Charleston, S. C		975,000.00		975,000.00	410,000.00		565,000.00
Georgetown, S. C		12,000.00		12,000.00	12,000.00		
Improving Winyaw Bay, S. C	24,000.00	100,000.00		124,000.00	54,000.00		70,000.00
Improving outer bar at Brunswick, Ga		100,000.00		100,000.00			100,000.00
Improving harbor at—							
Brunswick, Ga		27,500.00		27,500.00	27,500.00		
Darien, Ga		25,000.00		25,000.00	25,000.00		
Savannah, Ga	2,225.00	1,318,750.00		1,320,975.00	470,975.00		850,000.00
Improving Cumberland Sound, Ga. and Fla	1,000.00	170,000.00		171,000.00	171,000.00		
Improving Apalachicola Bay, Fla		20,000.00		20,000.00	20,000.00		
Improving channel, Charlotte Harbor and Pease Creek, Fla	30,000.00			30,000.00	30,000.00		
Improving Tampa Bay, Fla		10,000.00		10,000.00	10,000.00		
Improving harbor at—							
Key West, Fla		75,000.00		75,000.00	25,000.00		50,000.00
Pensacola, Fla	5,000.00	75,000.00		80,000.00	35,000.00		45,000.00
St. Augustine, Fla		10,000.00		10,000.00	10,000.00		
Mobile, Ala	10,000.00	712,500.00		722,500.00	165,000.00		557,500.00

New Orleans, La		80,000.00		80,000.00	80,000.00		
New Madrid, Mo		25,000.00		25,000.00	25,000.00		
St. Louis, Mo	31,000.00			31,000.00			31,000.00
Greenville, Miss		100,000.00		100,000.00	95,000.00		5,000.00
Vicksburg, Miss		80,000.00		80,000.00	40,000.00		40,000.00
Improving Biloxi Bay, Miss	9,000.00			9,000.00	9,000.00		
Improving harbors at Natchez and Vidalia, Miss		80,000.00		80,000.00	5,000.00		75,000.00
Improving ship channel in—							
West Galveston Bay, Tex		15,000.00		15,000.00	5,000.00		10,000.00
Galveston Bay, Tex	44,958.06	40,000.00		84,958.06	21,958.06		63,000.00
Improving harbor at—							
Brazos Santiago, Tex	56,855.00			56,855.00			56,855.00
Galveston Bay, Tex	529,997.19	1,450,000.00		1,979,997.19	589,879.19		1,390,118.00
Ashtabula, Ohio	8,220.00	70,000.00		78,220.00	9,220.00		69,000.00
Black River, Ohio		20,000.00		20,000.00	1,900.00		18,100.00
Cleveland, Ohio	26.31	100,000.00		100,026.31	11,231.00		88,795.31
Fairport, Ohio	1,000.00	35,000.00		36,000.00	2,000.00		34,000.00
Huron, Ohio		15,000.00		15,000.00	250.00		14,750.00
Port Clinton, Ohio		10,000.00		10,000.00	300.00		9,700.00
Sandusky City, Ohio	2,000.00	41,712.00		43,712.00	575.00		43,137.00
Toledo, Ohio	2,700.00	200,000.00		202,700.00	14,700.00		188,000.00
Vermillion, Ohio	2,000.00	2,000.00		4,000.00	4,000.00		
Conneaut, Ohio		40,000.00		40,000.00	700.00		39,300.00
Michigan City, Ind	12,141.72	45,000.00		57,141.72	9,000.00		48,141.72
Calumet, Ill	7,963.00	15,000.00		22,963.00	13,963.00		9,000.00
Chicago, Ill		72,000.00		72,000.00	13,000.00		59,000.00
Waukegan, Ill	7,000.00	25,000.00		32,000.00	7,000.00		25,000.00
Harbor of refuge at—							
Grand Marais, Mich	3,000.00	30,000.00		33,000.00	5,450.00		28,450.00
Portage Lake, Mich	4,000.00			4,000.00			4,000.00
Sand Beach, Mich	30,000.00	150,000.00		180,000.00	5,000.00		175,000.00
Improving harbor at—							
Black Lake, Mich		5,000.00		5,000.00			5,000.00
Charlevoix, Mich	2,000.00	10,000.00		12,000.00	2,000.00		10,000.00
Frankfort, Mich	4,000.00	10,000.00		14,000.00	9,000.00		5,000.00
Grand Haven, Mich	14,000.00	90,000.00		104,000.00	35,000.00		69,000.00
Manistee, Mich	2,000.00	50,000.00		52,000.00	22,000.00		30,000.00
Cheboygan, Mich	17,955.00			17,955.00			17,955.00
Ludington, Mich	1,500.00	5,000.00		6,500.00			6,500.00
Manistique, Mich	2,000.00			2,000.00			2,000.00
Marquette, Mich	14,000.00	80,000.00		94,000.00	56,200.00		37,800.00
Monroe, Mich		10,000.00		10,000.00	400.00		9,600.00
Muskegon, Mich	6,000.00	75,000.00		81,000.00	26,000.00		55,000.00
Ontonagon, Mich		20,000.00		20,000.00			20,000.00
Pentwater, Mich	1,000.00	5,000.00		6,000.00			6,000.00
Petoskey, Mich	15,000.00	20,000.00		35,000.00	219.20		34,780.80
St. Joseph, Mich		60,000.00		60,000.00	18,000.00		42,000.00
South Haven, Mich		10,000.00		10,000.00	2,000.00		8,000.00
White River, Mich	10,500.00	5,000.00		15,500.00	10,500.00		5,000.00
Improving Eagle Harbor, Mich	2,286.33			2,286.33			2,286.33
Improving mouth and harbor of Cedar River, Mich	1,500.00			1,500.00			1,500.00
Improving harbor of refuge at Lake Huron, Mich	4,865.20			4,865.20	4,865.20		

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1893, etc.—Continued.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892, to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Improving harbor at—							
Saugatuck, Mich		$5,000.00		$5,000.00	$4,000.00		$1,000.00
Au Sable, Mich			$196.50	196.50			196.50
Ahnapee, Wis		7,000.00		7,000.00	2,000.00		5,000.00
Ashland, Wis	$4,400.00	45,000.00		49,400.00	5,000.00		44,400.00
Green Bay, Wis	1,700.00	25,000.00		26,700.00	3,700.00		23,000.00
Kenosha, Wis	1,000.00	15,000.00		16,000.00	500.00		15,500.00
Kewaunee, Wis		30,000.00		30,000.00	12,000.00		18,000.00
Manitowoc, Wis		28,000.00		28,000.00	2,000.00		26,000.00
Milwaukee, Wis		14,000.00		14,000.00	12,000.00		2,000.00
Oconto, Wis		3,000.00		3,000.00			3,000.00
Pensaukee, Wis	500.00			500.00			500.00
Port Washington, Wis		6,500.00		6,500.00	6,500.00		
Racine, Wis		25,000.00		25,000.00	3,000.00		22,000.00
Superior Bay and St. Louis Bay, Wis	20,400.00	70,000.00		90,400.00	11,000.00		79,400.00
Sheboygan, Wis		25,000.00		25,000.00	10,000.00		15,000.00
Two Rivers, Wis		3,000.00		3,000.00	2,000.00		1,000.00
Harbor of refuge, Milwaukee Bay, Wis	15,500.00	75,000.00		90,500.00	8,000.00		82,500.00
Harbor of refuge at entrance of Sturgeon Bay Canal, Wis	500.00	5,000.00		5,500.00	3,000.00		2,500.00
Improving Minnesota Point at Superior, Wis			45.92	45.92			45.92
Ice harbor at Dubuque, Iowa	4,503.99			4,503.99			4,503.99
Improving harbor at—							
Memphis, Tenn		25,000.00		25,000.00	1,000.00		24,000.00
Agate Bay, Minn	1,000.00	30,000.00		31,000.00	6,000.00		25,000.00
Grand Marais, Minn		10,000.00		10,000.00			10,000.00
Duluth, Minn	15,376.00	125,000.00		140,376.00	58,666.11		81,709.89
Breakwater and Harbor of Refuge between Straits of Fuca and San Francisco, Cal.	140,858.52			140,858.52			140,858.52
Improving Humboldt Harbor and Bay, Cal	26,000.00	672,000.00		698,000.00	62,000.00		636,000.00
Improving harbor at—							
Oakland, Cal	62,443.07	150,000.00		212,443.07	105,000.00		107,443.07
Wilmington, Cal	8,111.10	51,000.00		59,111.10	30,000.00		29,111.10
San Louis Obispo, Cal		30,000.00		30,000.00	2,000.00		28,000.00
San Diego, Cal	47,000.00	50,000.00		97,000.00	30,098.30		66,901.70
San Francisco, Cal		.57		.57	.22		.35
Survey of Pacific Coast between Points Dumas and Capistrane, Cal	3,350.00			3,350.00			3,350.00
Survey of San Francisco Harbor, San Pablo and Suisun bays, Straits of Carquinez, and mouths of San Joaquin and Sacramento rivers, Cal	1,000.00			1,000.00			1,000.00

Examination for deep-water harbor at San Pedro or Santa Monica bays, Cal.		10,000.00		10,000.00	10,000.00		
Improving entrance to Coos Bay and Harbor, Ore.	1,740.60	210,000.00		211,740.60	83,745.84		127,994.76
Improving Yaquina Bay, Ore.	13,921.43	85,000.00		98,921.43	68,921.43		30,000.00
Improving Tillamook Bay and Bar, Ore.		15,000.00		15,000.00	6,000.00		9,000.00
Improving Nehalem Bay, Ore.	8,500.00		1,084.92	9,584.92			9,584.92
Improving Gray's Harbor and Chehalis River, Wash.		50,000.00		50,000.00	21,000.00		29,000.00
Improving harbor at Olympia, Wash		35,000.00		35,000.00	11,000.00		24,000.00
Preservation of Portage Lake and Lake Superior Canals	10,000.00			10,000.00		$10,000.00	
Ship channel connecting waters of the Great Lakes between Chicago, Duluth, and Buffalo		1,250,000.00		1,250,000.00	25,000.00		1,225,000.00
Improving Moosabec Bar at Jonesport, Me.	8,500.00	15,000.00		23,500.00	3,500.00		20,000.00
Improving Bagaduce River, Me.	5,800.00	5,000.00		10,800.00			10,800.00
Improving Harrisseckit River, Me.	10,000.00	16,000.00		26,000.00	1,000.00		25,000.00
Improving Kennebunk River, Me.	3,400.00			3,400.00	1,892.50		1,507.50
Improving Kennebec River, Me		100,000.00		100,000.00	25,000.00		75,000.00
Improving Penobscot River, Me.	15,000.00	40,000.00		55,000.00	15,000.00		40,000.00
Improving Narragaugus River, Me.		7,500.00		7,500.00	1,000.00		6,500.00
Improving Saco River, Me.	34,500.00	25,000.00		59,500.00	34,500.00		25,000.00
Improving St. Croix River, Me.	35,000.00			35,000.00			35,000.00
Improving Bellamy River, N. H.	4,500.00	7,500.00		12,000.00	4,500.00		7,500.00
Improving Cocheco River, N. H.		15,000.00		15,000.00			15,000.00
Improving Otter Creek, Vt.		10,000.00		10,000.00	1,050.00		8,950.00
Improving Ipswich River, Mass.	2,395.00	2,500.00		4,895.00	100.00		4,795.00
Improving Merrimac River, Mass.	9,900.00	1,500.00		11,400.00	5,000.00		6,400.00
Improving Powow River, Mass.	8,000.00	4,000.00		12,000.00			12,000.00
Improving Taunton River, Mass.		7,000.00		7,000.00	7,000.00		
Improving Weymouth River, Mass.		10,000.00		10,000.00	100.00		9,900.00
Improving Mystic and Malden rivers, Mass.		10,000.00		10,000.00	100.00		9,900.00
Improving Essex River, Mass.		5,000.00		5,000.00			5,000.00
Removing Green Jacket Shoal, Providence River, R. I.		10,000.00		10,000.00	700.00		9,300.00
Improving Providence River and Narragansett Bay, R. I.		50,000.00		50,000.00	11,300.00		38,700.00
Improving Pawcatuck River, R. I.		3,800.00		3,800.00	1,300.00		2,500.00
Improving Pawtucket River, R. I.		35,000.00		35,000.00	700.00		34,300.00
Improving Connecticut River between Hartford and Holyoke, Conn	8,940.30			8,940.30			8,940.30
Improving Connecticut River, Conn.		20,000.00		20,000.00	6,500.00		13,500.00
Improving Housatonic River, Conn.	2,935.00	20,000.00		22,935.00	12,000.00		10,935.00
Improving Mystic River, Conn.		10,000.00		10,000.00	6,846.17		3,153.83
Improving Thames River, Conn.	3,918.00	30,000.00		33,918.00	18,000.00		15,918.00
Improving Saugatuck River, Conn.		7,000.00		7,000.00	3,104.81		3,895.19
Removing obstructions in East River and Hell Gate, N. Y.	45,000.00	150,000.00		195,000.00	140,000.00		55,000.00
Improving Browns Creek, N. Y.		5,000.00		5,000.00	5,000.00		
Improving East Chester Creek, N. Y.	6,941.00			6,941.00	6,941.00		
Improving narrows at Lake Champlain, N. Y. and Vt.	2,290.04	18,500.00		20,790.04	5,090.04		15,700.00
Improving Great Chazy River, N. Y.		5,000.00		5,000.00	5,000.00		
Improving Harlem River, N. Y.	170,000.00	175,000.00		345,000.00	170,000.00		175,000.00
Improving Hudson River, N. Y.	33,000.00	687,500.00		720,500.00	70,000.00		650,500.00
Improving Patchogue River, N. Y.	500.00	8,000.00		8,500.00	8,500.00		
Improving St. Lawrence River, N. Y.		10,000.00		10,000.00	4,350.00		5,650.00
Improving Newtown Creek, N. Y.		35,000.00		35,000.00	35,000.00		
Improving Niagara River, N. Y.		20,000.00		20,000.00			20,000.00
Improving Goshen Creek, N. J.		3,000.00		3,000.00	3,000.00		

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1893, etc.—Continued.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892 to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Improving Alloway Creek, N. J.		$3,000.00		$3,000.00	$3,000.00		
Improving Mattawan Creek, N. J.		9,620.00		9,620.00	4,500.00		$5,120.00
Improving Elizabeth River, N. J.		5,000.00		5,000.00	500.00		4,500.00
Improving Passaic River, N. J.	$7,250.00	45,000.00		52,250.00	15,000.00		37,250.00
Improving Raritan River, N. J.	12,500.00	40,000.00		52,500.00	21,500.00		31,000.00
Improving Shrewsbury River, N. J.		10,000.00		10,000.00	8,000.00		2,000.00
Improving South River, N. J.	894.00	7,000.00		7,894.00	6,500.00		1,349.00
Improving Racoon River, N. J.	2,242.77			2,242.77			2,242.77
Improving Squan River, N. J.	2,000.00			2,000.00			2,000.00
Improving Rancocas River, N. J.		5,000.00		5,000.00	5,000.00		
Improving Salem River, N. J.		2,500.00		2,500.00	2,500.00		
Dam at Hert's Island, Allegheny River, near Pittsburg, Pa	67,898.23	40,000.00		107,898.23	500.00		107,398.23
Purchase of upper lock and dam, Monongahela River, between Pittsburg, Pa., and Morgantown, W. Va.	323,333.13			323,333.13			323,333.13
Cost of condemnation of upper lock and dam, Monongahela River, between Pittsburg, Pa., and Morgantown, W. Va.	5,102.32			5,102.32			5,102.32
Improving Allegheny River, Pa.	550.89	25,000.00		25,550.89	4,750.89		20,800.00
Improving Delaware River, Pa. and N. J.	148,500.00	50,000.00		198,500.00	71,500.00		127,000.00
Improving Schuykill River, Pa.	23,500.00	46,250.00		69,750.00	43,500.00		26,250.00
Survey of Delaware River between Philadelphia, Pa., and Camden, N. J.	4,465.28			4,465.28			4,465.28
Improving Murderkill River, Del		7,000.00		7,000.00	350.00		6,650.00
Improving Mispillion Creek, Del		12,000.00		12,000.00	6,000.00		6,000.00
Improving Appoquinimink River, Del		5,000.00		5,000.00	5,000.00		
Improving Smyrna River, Del		3,000.00		3,000.00			3,000.00
Improving Broad Creek, Del		5,000.00		5,000.00	5,000.00		
Improving Choptank River, Md.	7,000.00	3,000.00		10,000.00	10,000.00		
Improving Chester River, Md.	2,958.54	3,000.00		5,958.54	3,000.00		2,958.54
Improving Elk River, Md.	800.00	5,000.00		5,800.00	5,800.00		
Improving North East River, Md.		2,640.00		2,640.00	2,640.00		
Improving Manokin River, Md		7,500.00		7,500.00	7,500.00		
Improving Patuxent River, Md	640.87			640.87			640.87
Improving Susquehanna River near Havre de Grace, Md.	4,000.00	4,000.00		8,000.00			8,000.00
Improving Wicomico River, Md	500.00	6,500.00		7,000.00			7,000.00
Improving Patapsco River, Md		28,000.00		28,000.00	28,000.00		
Improving Potomac River	43,478.12	200,000.00		243,478.12	54,978.12		188,500.00
Improving Warwick River, Md.		6,000.00		6,000.00	6,000.00		
Improving Latrappe River, Md		2,500.00		2,500.00	2,500.00		
Improving waterway from Chincoteague Bay to Indian River Bay, Va., Md., and Del.	50,000.00	25,000.00		75,000.00	1,000.00		74,000.00

Improving Acquia Creek, Va		5,000.00		5,000.00	1,000.00		4,000.00
Improving Occoquan Creek, Va		5,000.00		5,000.00	4,000.00		1,000.00
Improving Nomini Creek, Va		10,000.00		10,000.00	2,500.00		7,500.00
Improving Urbana Creek, Va		3,000.00		3,000.00	1,000.00		2,000.00
Improving Appomattox River, Va	2,500.00	15,080.00		17,580.00	11,580.00		6,000.00
Improving Chickahominy River, Va		5,000.00		5,000.00			5,000.00
Improving James River, Va	20,000.00	200,000.00		220,000.00	95,000.00		125,000.00
Improving Mattaponi River, Va		4,000.00		4,000.00	1,000.00		3,000.00
Improving Nansemond River, Va	11,000.00	10,000.00		21,000.00	21,000.00		
Improving Pamunkey River, Va		3,000.00		3,000.00			3,000.00
Improving Rappahannock River, Va	1,910.89	20,000.00		21,910.89	8,910.89		13,000.00
Improving Staunton River Va	7,834.74			7,834.74	150.00		7,684.74
Improving York River, Va	12,428.13	35,000.00		47,428.13	2,500.00		44,928.13
Improving North Landing River, Va. and N. C	2,500.00			2,500.00	1,200.00		1,300.00
Improving New River, Va. and W. Va	2,341.79			2,341.79			2,341.79
Improving Dan River, Va. and N. C	39.63			39.63			39.63
Improving Lower Machodoc Creek, Va		3,000.00		3,000.00	500.00		2,500.00
Improving Big Sandy River, W. Va. and Ky	11,000.00	55,000.00		66,000.00	52,000.00		14,000.00
Improving Elk River, W .Va		2,500.00		2,500.00	2,500.00		
Improving Gauley River, W. Va		3,000.00		3,000.00	3,000.00		
Improving Guyandotte River, W. Va		2,000.00		2,000.00	2,000.00		
Improving Great Kanawha River, W. Va	165,301.69	725,000.00		890,301.69	185,020.00		705,281.69
Improving Monongahela River, W. Va		25,000.00		25,000.00	2,500.00		22,500.00
Improving Shenandoah River, W. Va	16,020.95			16,020.95			16,020.95
Improving waterway from Norfolk Harbor, Va. to Albemarle Sound, N. C		9,000.00		9,000.00			9,000.00
Improving Ocracoke Inlet, N. C	87,000.00	15,000.00		102,000.00	2,000.00		100,000.00
Improving waterway between New River and Swansboro, N. C	4,200.00			4,200.00			4,200.00
Improving Contentnia Creek, N. C	1,000.00	7,000.00		8,000.00	4,000.00		4,000.00
Improving Fishing Creek, N. C	10,000.00	5,000.00		15,000.00			15,000.00
Improving Cape Fear River, N. C	26,701.50	220,000.00		246,701.50	71,701.50		175,000.00
Improving Pasquotank River, N. C		3,000.00		3,000.00	2,500.00		500.00
Improving New River, N. C	7,990.00	5,000.00		12,990.00	6,000.00		6,990.00
Improving Neuse River, N. C	8,507.85	1,500.00		23,507.85	4,504.85		19,003.00
Improving Lockwoods Folly River, N. C		3,000.00		3,000.00			3,000.00
Improving Lumber River, N. C		5,000.00		5,000.00	3,400.00		1,600.00
Improving Pamlico and Tar rivers, N. C	1,300.00	10,000.00		11,300.00	9,300.00		2,000.00
Improving Roanoke River, N. C	6,606.76	50,000.00		56,606.76	13,600.00		43,006.76
Improving Trent River, N. C	13.50	5,000.00		5,013.50	1,500.00		3,513.50
Improving Yadkin River, N. C		5,000.00		5,000.00	500.00		4,500.00
Improving Waccamaw River, N. C. and S. C		10,000.00		10,000.00	5,800.00		4,200.00
Improving Black River, N. C		10,000.00		10,000.00	4,000.00		6,000.00
Improving Mingo Creek, S. C		3,000.00		3,000.00	1,700.00		1,300.00
Improving Wappoo Cut, S. C		10,000.00		10,000.00	10,000.00		
Improving Ashley River, S. C	755.37			755.37	752.56		2.81
Improving Beaufort River, S. C	2,800.00	12,500.00		15,300.00	15,300.00		
Improving Congaree River, S. C		5,000.00		5,000.00	2,500.00		2,500.00
Improving Clark's River, S. C		2,500.00		2,500.00	2,500.00		
Improving Edisto River, S. C		7,385.00		7,385.00	7,385.00		
Improving Great Pee Dee River, S. C	3,011.75	10,000.00		13,011.75	6,911.75		6,100.00
Improving Little Pee Dee River, S. C		5,000.00		5,000.00	2,200.00		2,800.00
Improving Salkahatchie River, S. C	4,000.00			4,000.00	237.76		3,762.24

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1893, etc.—Continued.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892, to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Improving Santee River, S. C	$7,001.80	$30,000.00		$37,001.80	$31,005.80		$5,996.00
Improving Wateree River, S. C	5,500.00	2,500.00		8,000.00	5,300.00		2,700.00
Improving Jeckyl Creek, Ga		7,500.00		7,500.00	7,500.00		
Improving Altamaha River, Ga	6,000.00	15,000.00		21,000.00	19,000.00		2,000.00
Improving Chattahoochee River, Ga		25,000.00		25,000.00	22,000.00		3,000.00
Improving Coosa River, Ga. and Ala	84,013.64	230,000.00		314,013.64	135,079.16		178,934.48
Improving Flint River, Ga		15,000.00		15,000.00	11,000.00		4,000.00
Improving Ocmulgee River, Ga		25,000.00		25,000.00	20,999.20		4,000.80
Improving Oconee River, Ga		25,000.00		25,000.00	13,500.00		11,500.00
Improving Oostenaula and Coosawattee rivers, Ga	499.39			499.39			499.39
Improving Savannah River, Ga		45,000.00		45,000.00	22,250.00		22,750.00
Waterway between Savannah, Ga., and Fernandina, Fla		15,000.00		15,000.00	15,000.00		
Improving Lagrange Bayou, Fla	4,839.20			4,839.20			4,839.20
Improving Sarasota Bay, Fla		2,500.00		2,500.00	2,500.00		
Improving Volusia Bar, Fla		1,000.00		1,000.00	1,000.00		
Improving Acklawaha River, Fla		1,000.00		1,000.00	1,000.00		
Improving Apalachicola River, Fla		5,000.00		5,000.00	5,000.00		
Improving Choctawhatchee River, Fla. and Ala	2,000.00	12,500.00		14,500.00	7,010.73		7,489.27
Improving Caloosahatchee River, Fla		1,000.00		1,000.00			1,000.00
Improving Escambia and Conecuh rivers, Fla. and Ala		8,000.00		8,000.00	8,000.00		
Improving Manatee River, Fla	6,000.00	6,000.00		12,000.00	12,000.00		
Improving St. John's River, Fla	54,930.05	397,000.00		451,930.05	76,975.16		374,954.89
Improving Suwanee River, Fla		3,000.00		3,000.00	3,000.00		
Improving Indian River, Fla		15,000.00		15,000.00			15,000.00
Improving Alabama River, Ala	3,094.43	70,000.00		73,094.43	38,000.00		35,094.43
Improving Black Warrior River, Ala	30,000.00	200,000.00		230,000.00	80,000.00		150,000.00
Improving Cahawba River, Ala		7,500.00		7,500.00	6,000.00		1,500.00
Improving Warrior and Tombigbee rivers, Ala. and Miss	14,981.52	244,000.00		258,981.52	65,981.52		193,000.00
Improving Yazoo River, Miss	2,000.00	95,000.00		97,000.00	21,800.00		75,200.00
Improving Tchula Lake, Miss		3,000.00		3,000.00	53.82		2,946.18
Improving Steeles Bayou, Miss		2,500.00		2,500.00	56.43		2,443.57
Improving Big Black River, Miss		5,000.00		5,000.00			5,000.00
Improving Big Sunflower River, Miss		5,000.00		5,000.00	5,000.00		
Improving Chickasahay River, Miss		5,000.00		5,000.00	5,000.00		
Improving Leaf River, Miss		5,000.00		5,000.00	2,500.00		2,500.00
Improving Noxubee River, Miss		3,000.00		3,000.00			3,000.00
Improving Pascagoula River, Miss		20,000.00		20,000.00	20,000.00		
Improving Pearl River, Miss	8,981.00	20,500.00		29,481.00	9,481.00		20,000.00
Improving Tallahatchee River, Miss		5,000.00		5,000.00	4,000.00		1,000.00

Improving Mississippi River	683,937.19	4,665,000.00		5,348,937.19	2,470,020.78		2,878,916.41
Improving Mississippi River from Minneapolis to Des Moines Rapids, Minn., Iowa, Mo., Ill., and Wis	76,504.64			76,504.64	73,504.64		3,000.00
Improving Mississippi River from Des Moines Rapids to mouth of Illinois River, Ill. and Mo	24,053.23			24,053.23	24,053.23		
Improving Mississippi River between mouths of Ohio and Illinois Rivers	106,100.00			106,100.00	71,000.00		35,100.00
Improving Mississippi River above Falls of St. Anthony, Minn	1,595.17			1,595.17	1,595.17		
Improving Mississippi River from St. Paul to Des Moines Rapids, Minn., Iowa, Ill., and Wis	1,000.00			1,000.00	1,000.00		
Reservoirs at head waters of Mississippi River	30,999.16	60,000.00		90,999.16	46,377.67		44,621.49
Improving Des Moines Rapids, Mississippi River, Iowa and Ill	3,500.00			3,500.00	2,000.00		1,500.00
Gauging the waters of Lower Mississippi and its tributaries		6,000.00		6,000.00	6,000.00		
Operating snag and dredge boats on upper Mississippi River		25,000.00		25,000.00	25,000.00		
Removing obstructions in Mississippi River		100,000.00		100,000.00	100,000.00		
Constructing jetties and other works at South Pass, Mississippi River		87,500.00		87,500.00	87,500.00		
Examination and surveys at South Pass, Mississippi River		10,000.00		10,000.00	10,000.00		
Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn		2,650,000.00		2,650,000.00	600,000.00		2,050,000.00
Mississippi River Commission	107.75	44.80		152.55	44.80		107.75
Improving Bayou Vermillion, La		7,500.00		7,500.00	7,500.00		
Improving Bogue Chitto, La	2,500.00	5,000.00		7,500.00	2,500.00		5,000.00
Improving Bayou Bœuf, La		10,000.00		10,000.00			10,000.00
Improving Bayou Bartholomew, La. and Ark		5,000.00		5,000.00			5,000.00
Improving Bayou Black, La	319.31			319.31			319.31
Improving Bayou D'Arbonne, La		4,000.00		4,000.00	500.00		3,500.00
Improving Bayou Lafourche, La	53,800.00	50,000.00		103,800.00	32,500.00		71,300.00
Improving Bayou Plaquemine, La	65,000.00	150,000.00		215,000.00	14,700.00		200,300.00
Improving Bayou Terrebonne, La	2,992.00			2,992.00			2,992.00
Connecting Bayou Teche with Grand Lake at Charenton, La	22,100.05			22,100.05			22,100.05
Improving Amite River, La	2.50	2,500.00		2,502.50	1,500.00		1,002.50
Improving Calcasieu River and Pass, La	84,877.00	100,000.00		184,877.00	28,500.00		156,377.00
Improving Tensas River, La	2,700.00	5,000.00		7,700.00	6,125.00		1,575.00
Improving Tickfaw River, La		1,000.00		1,000.00	1,000.00		
Improving Tchefuncte River, La		1,000.00		1,000.00	1,000.00		
Improving Red River, La. and Ark	37,993.65	145,000.00		182,993.65	96,693.65		86,300.00
Improving Mermentan River, La		7,500.00		7,500.00	7,500.00		
Improving Atchafalaya and Red rivers, La		80,000.00		80,000.00			80,000.00
Improving Aransas Pass and Bay, Tex	40,667.35			40,667.35			40,667.35
Improving Sabine River, Tex	36,000.00	350,000.00		386,000.00	164,000.00		222,000.00
Improving mouth of Brazos River, Tex	16,651.57			16,651.57			16,651.57
Improving Passo Cavallo, Tex	35,368.78			35,368.78			35,368.78
Improving Buffalo Bayou, Tex	2,000.00	25,000.00		27,000.00	10,000.00		17,000.00
Improving Cedar Bayou, Tex	1,500.00	14,000.00		15,500.00	8,000.00		7,500.00
Improving Cypress Bayou, Tex		2,000.00		2,000.00	2,000.00		
Improving Trinity River, Tex	700.00	10,000.00		10,700.00	700.00		10,000.00
Improving Neches River, Tex	4,157.84			4,157.84			4,157.84
Improving Sabine River, Tex		5,000.00		5,000.00	200.00		4,800.00
Removing obstructions in Arkansas River, Ark. and Kans	1,297.27	20,000.00		21,297.27	14,303.10		6,994.17
Improving Arkansas River, Ark		250,000.00		250,000.00	146,493.07		103,506.93
Improving Black River, Ark. and Mo	179.66	5,000.00		5,179.66	4,680.27		499.39
Improving Fourche Le Fevre River, Ark	992.75			992.75	100.00		892.75
Improving Cache River, Ark		2,000.00		2,000.00	2,000.00		

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1893, etc.—Continued.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892, to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Improving Ouachita River, Ark. and La	$159.33	$40,000.00		$40,159.33	$10,159.33		$30,000.00
Improving St. Francis River, Ark		8,000.00		8,000.00	4,908.67		3,091.33
Improving Red River above Fulton, Ark		3,500.00		3,500.00	3,500.00		
Improving White River, Ark	32.64	75,000.00		75,032.64	31,568.07		43,464.57
Improving Petit Jean River, Ark		3,500.00		3,500.00	1,000.00		2,500.00
Improving Clinch River, Tenn		4,000.00		4,000.00	1,000.00		3,000.00
Improving Big Hatchie River, Tenn	1,000.00	3,500.00		4,500.00			4,500.00
Improving Cumberland River above Nashville, Tenn	357,004.09	250,000.00		607,004.09	109,004.09		498,000.00
Improving Cumberland River below Nashville, Tenn	15,000.00	40,000.00		55,000.00	27,000.00		28,000.00
Improving French Broad River, Tenn		15,000.00		15,000.00	5,000.00		10,000.00
Improving Forked Deer River, Tenn		3,000.00		3,000.00			3,000.00
Improving Hiawassee River, Tenn	500.00			500.00	500.00		
Improving Tennessee River above Chattanooga, Tenn	1,000.00	25,000.00		26,000.00	20,000.00		6,000.00
Improving Tennessee River below Chattanooga, Tenn., Ala., and Ky	130,853.91	500,000.00		630,853.91	140,000.00		490,853.91
Improving Obion River, Tenn		7,500.00		7,500.00	6,000.00		1,500.00
Improving Obeys River, Tenn			$17.86	17.86			17.86
Improving Falls of the Ohio River, at Louisville, Ky	57,809.00	95,000.00		152,809.00	142,809.00		10,000.00
Improving Kentucky River, Ky		150,000.00		150,000.00	59,129.14		90,870.86
Improving Rough River, Ky	15,000.00	15,000.00		30,000.00			30,000.00
Improving Tradewater River, Ky	485.00			485.00			485.00
Improving Green River, Ky		115,000.00		115,000.00	26,000.00		89,000.00
Improving South Fork, Cumberland River, Ky			32.98	32.98			32.98
Survey of the Ohio River below Pittsburg, Pa	9,565.92			9,565.92			9,565.92
Improving Ohio River below Pittsburg, Pa	242,309.43	100,000.00		342,309.43	103,450.00		238,859.43
Improving Ohio River	42,507.50	360,000.00		402,507.50	108,124.34		294,383.16
Improving Muskingum River, Ohio	13,617.53			13,617.53	500.00		13,117.53
Improving Sandusky River, Ohio		5,000.00		5,000.00	2,300.00		2,700.00
Operating snag boats on Ohio River		25,000.00		25,000.00	25,000.00		
Improving Detroit River, Mich		30,000.00		30,000.00	10,000.00		20,000.00
Examination of Portage Lake and Lake Superior Ship Canals, Mich	1,000.00		1,310.92	2,310.92			2,310.92
Improving Hay Lake channel Sault Ste. Marie River, Mich	430,000.00	340,000.00		770,000.00	320,000.00		450,000.00
Improving Black River, Mich	9,500.00	20,000.00		29,500.00	24,500.00		5,000.00
Improving Clinton River, Mich		8,564.00		8,564.00	5,000.00		3,564.00
Improving Menomonee River, Mich. and Wis	6,000.00	20,500.00		26,500.00	11,500.00		15,000.00
Improving Saginaw River, Mich		100,000.00		100,000.00	30,000.00		70,000.00
Improving Rouge River, Mich		11,690.00		11,690.00	11,690.00		
Improving St. Mary's River, Mich	1,726,509.00	1,230,000.00		2,956,509.00	526,509.00		2,430,000.00
Improving St. Mary's River, and St. Mary's Falls Canal, Mich	182.31			182.31			182.31

Improving Thunder Bay River, Mich		10,000.00	10,000.00	5,000.00		5,000.00
Turning Basin Rouge River, Mich		5,000.00	5,000.00	3,000.00		2,000.00
Improving waterway from Keweenaw Bay to Lake Superior, Mich		50,000.00	50,000.00	17,000.00		33,000.00
Sturgeon Bay and Lake Michigan Ship Canal, Mich		81,833.00	81,833.00	81,833.00		
Improving Chippewa River, Wis	3.30	5,000.00	5,003.30	5,003.30		
Improving St. Croix, Wis. and Minn		8,000.00	8,000.00	6,000.00		2,000.00
Improving Fox River, Wis	27,000.00	75,000.00	102,000.00	54,298.00		47,702.00
Damages by improvement of Fox and Wisconsin Rivers, Wis		140,007.83	140,007.83	139,957.83	$50.00	
Improving Red River of the North, Minn. and Dak	6.52	25,000.00	25,006.52	20,549.92		4,456.60
Improving Minnesota River, Minn	9,967.00		9,967.00	500.00		9,467.00
Improving White River, Ind	2,488.00	5,000.00	7,488.00	1,000.00		6,488.00
Improving Wabash River, Ind. and Ill	11,000.00	65,000.00	76,000.00	35,000.00		41,000.00
Illinois and Mississippi Canal, Ill	461,450.00	500,000.00	961,450.00	152,599.50		808,850.50
Improving Calumet River, Ill		75,000.00	75,000.00	5,500.00		69,500.00
Improving Illinois River, Ill	44,284.85	100,000.00	144,284.85	94,284.85		50,000.00
Improving Galena River, Ill	100,000.00		100,000.00			100,000.00
Improving Kaskaskia River, Ill		4,500.00	4,500.00	3,500.00		1,000.00
Improving Gasconade River, Mo	1,000.00	4,000.00	5,000.00	2,500.00		2,500.00
Improving Little River, Mo. and Ark	.08	.80	.88	.88		
Improving Osage River, Mo. and Kans	47,500.00	50,000.00	97,500.00	4,000.00		93,500.00
Improving St. Francis River, Mo. and Kans	1,334.47		1,334.47	.48		1,333.99
Improving Missouri River from mouth to Sioux City, Iowa	54,037.88	1,350,000.00	1,504,037.88	708,500.00		795,537.88
Improving Missouri River	189,719.79	150,000.28	239,720.07	89,668.24	.28	150,051.55
Improving Yellowstone River, Mont. and Dak	11,720.00		11,720.00			11,720.00
Examination of Missouri River from Three Forks to Canyon Ferry, Mont		2,500.00	2,500.00	1,000.00		1,500.00
Improving Colorado River at Yuma, Ariz		10,000.00	10,000.00	500.00		9,500.00
Improving Upper Snake River Idaho		20,000.00	20,000.00	20,000.00		
Improving Pentalumas Creek, Cal		10,000.00	10,000.00	6,000.00		4,000.00
Improving Sacramento and Feather Rivers, Cal		150,000.00	150,000.00	10,000.00		140,000.00
Improving San Joaquin River, Cal	17.06	65,000.00	65,017.06	24,500.00		40,517.06
Improving Mokelumne River, Cal		2,500.00	2,500.00			2,500.00
Examination and survey of Columbia River, Oreg	3,169.49		3,169.49			3,169.49
Improving mouth of Columbia River, Oregon and Wash		350,000.00	350,000.00	178,000.00		172,000.00
Improving Columbia at Cascades, Oreg		1,565,903.00	1,565,903.00	10,000.00		1,555,903.00
Improving Columbia and Lower Willamette rivers below Portland, Oreg	10,000.00	150,000.00	160,000.00	140,000.00		20,000.00
Improving Coquille River, Oreg	51.52	30,000.00	30,051.52	20,051.52		10,000.00
Improving Siuslaw River, Oreg	15,000.00	20,000.00	35,000.00	31,000.00		4,000.00
Improving Upper Columbia and Snake rivers, Oreg. and Wash	6,000.00	15,000.00	21,000.00	21,000.00		
Improving Umpqua River, Oreg	502.73		502.73			502.73
Improving Willamette River above Portland, Oreg	2,000.00	30,000.00	32,000.00	17,000.00		15,000.00
Examination of obstructions in Columbia River, Oreg		20,000.00	20,000.00	20,000.00		
Improving Willapa River and harbor, Wash		18,000.00	18,000.00	18,000.00		
Improving Columbia River from Rock Island Rapids to Priest Rapids, Wash	10,000.00		10,000.00	2,000.00		8,000.00
Improving Cowlitz River, Wash	1,500.00	3,000.00	4,500.00	3,500.00		1,000.00
Improving Puget Sound, Wash		15,000.00	15,000.00	7,000.00		8,000.00
Improving Swinomish Slough, Wash		25,000.00	25,000.00	1,000.00		24,000.00
Improving Nasel River, Wash		1,500.00	1,500.00	1,500.00		
Improving Columbia River, Wash		33,000.00	33,000.00	28,000.00		5,000.00
Surveys for deep water harbor, Gulf of Mexico	766.96		766.96			766.96
Operating and care of canals and other works of navigation		456,362.59	456,362.59	456,362.59		
Removing sunken vessels or craft obstructing or endangering navigation		34,498.57	34,498.57	34,498.57		

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1893, etc.—Continued.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892, to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Examinations, surveys, and contingencies of rivers and harbors	$93,973.52	$125,000.00		$218,973.52	$60,746.44		$158,227.08
Total harbors and rivers	9,796,174.39	37,183,786.44	$3,543.03	46,983,503.86	15,227,037.37	$11,046.77	31,745,419.72
Deduct repayments in excess of payments					3,543.03		
Actual expenditures					15,223,494.34		
MISCELLANEOUS OBJECTS.							
Signal Service.							
Observation and report of storms	27,081.14	4,821.45		31,902.59	13,240.69	18,661.90	
Road to the signal station on Pike's Peak	10,000.00			10,000.00			10,000.00
Signal Service:							
Medical department	112.63	192.25		304.88	192.25	112.63	
Pay, etc	7,963.94	481.84		8,445.78	504.54	7,941.24	
Regular supplies	2,372.00	195.57		2,567.57	195.57	2,372.00	
Incidental expenses	59.84			59.84		59.84	
Transportation	3,353.74	548.11		3,901.85	1,413.31	2,488.54	
Clothing		.41		.41	.41		
Military telegraph lines	34.43	103.44	98.42	236.29			236.29
Total Signal Service	50,977.72	6,343.07	98.42	57,419.21	15,546.77	31,636.15	10,236.29
Repayments in excess of payments					98.42		
Actual expenditures					15,448.35		
National cemeteries.							
National cemeteries	1,134.09	100,008.25		101,142.34	98,689.82		2,452.52
Pay of superintendents of national cemeteries	1,331.50	61,880.00		63,211.50	61,092.50	413.17	1,705.83
Road from—							
Natchez to the national cemetery, Mississippi	83.65		10.43	94.08		94.08	
New Berne to the national cemetery, North Carolina	9.95			9.95		9.95	
Antietam to the national cemetery, Maryland	3.12			3.12		3.12	
Florence to the national cemetery, South Carolina			547.08	547.08		547.08	
Staunton to the national cemetery, Virginia	234.81			234.81		234.81	
Alexandria to the national cemetery, Virginia	3.84			3.84		3.84	

National cemetery near Mound City to Mounds Junction, Ill	10,000.00			10,000.00	10,000.00		
Corinth to the national cemetery, Mississippi			164.13	164.13		164.13	
Road to the national cemetery—							
At Hampton, Va	2,000.00			2,000.00			2,000.00
Near Beverly, N. J	451.44			451.44		451.44	
At Port Hudson, La			31.81	31.81		31.81	
Near Fredericksburg, Va	1.35			1.35		1.35	
Approaches to the national cemetery—							
At Culpeper, Va	.24			.24		.24	
Near Danville, Va	442.28			442.28		442.28	
Road to the national cemetery, Presidio of San Francisco, Cal	1,000.00	10,000.00		11,000.00	7,320.00		3,680.00
Levee at Brownsville national cemetery, Texas	243.00			243.00		243.00	
Repairing roads to national cemeteries	18,212.11	10,000.00		28,212.11	6,122.34		22,089.77
Headstones for graves of soldiers	46,020.06	10,000.00		56,020.09	28,709.01		27,311.08
Burial of indigent soldiers		3,000.00		3,000.00	3,000.00		
Total national cemeteries	81,171.47	194,888.25	753.45	276,813.17	214,933.67	2,640.30	59,239.20
Repayments in excess of payments					753.45		
Actual expenditures					214,180.22		
Artificial limbs and appliances, and support of destitute patients.							
Maintenance of Garfield Hospital		15,000.00		15,000.00	14,999.85		.15
Support and medical treatment of destitute patients	1,906.02	19,000.00		20,906.02	18,999.96	322.65	1,583.41
Artificial limbs	7,895.98	175,000.00		182,895.98	125,194.48	1,479.72	56,221.78
Appliances for disabled soldiers		2,000.00		2,000.00	1,912.99	58.61	28.40
Trusses for disabled soldiers		14,833.92		14,833.92	14,833.92		
Total artificial limbs and appliances and support of destitute patients	9,802.00	225,833.92		235,635.92	175,941.20	1,860.98	57,833.74
Civil surveys.							
Transportation of reports and maps to foreign countries	1.77	100.00		101.77	48.02	1.77	51.98
Battle lines and sites for tablets at Antietam	7,500.00	16,310.00		23,810.00	4,500.00		19,310.00
Survey of road from Aqueduct Bridge to Mount Vernon	2,112.71			2,112.71			2,112.71
Survey of Northern and Northwestern lakes	9,808.40	7,000.00		16,808.40	5,910.89	10,054.61	842.90
Total civil surveys	19,422.88	23,410.00		42,832.88	10,458.91	10,056.38	22,317.59
Miscellaneous.							
Prevention of obstructive and injurious deposits within the harbor and adjacent waters of New York city	9,639.35	33,000.00		42,639.35	33,948.49	5,079.33	3,611.53
Secret service fund		555.15		555.15	555.15		
Ordnance stores for Washington and Maine	373.39			373.39		373.39	
Arming and equipping the militia	273,172.63	400,000.00		673,172.63	449,680.86		223,491.77
Artillery school, Fortress Monroe, Va		5,000.00		5,000.00	5,000.00		
Infantry and cavalry school, Fort Leavenworth, Kans		1,500.00		1,500.00	1,500.00		
Water supply, Fort D. A. Russell, Wyo	2,958.15			2,958.15			2,958.15
Support of military prison, Fort Leavenworth, Kans	20,381.43	80,195.07		100,576.50	75,533.28	10,581.05	14,462.17
Publication of Official Records of War of the Rebellion	83,000.00	235,000.00		318,000.00	230,900.39		87,099.61

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1893, etc.—Continued.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892, to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
MISCELLANEOUS OBJECTS—continued.							
Miscellaneous—Continued.							
Reprinting war maps	$98.02			$98.02		$98.02	
Index of Confederate records, War Department	14,600.00			14,600.00	$14,460.39		$139.61
National encampment Grand Army of the Republic		$90,000.00		90,000.00	87,862.31		2,137.69
Expenses of military convicts	4,417.64	6,111.40		10,529.04	3,218.16	1,021.44	6,289.44
State or Territorial homes for disabled volunteer soldiers and sailors		703,256.78		703,256.78	703,256.78		
Support of National Home for disabled volunteer soldiers	201,561.59	2,617,841.27		2,819,402.86	2,483,497.85	170,590.01	165,315.00
Support of Soldiers' Home	2,464,225.12	399,683.25		2,863,908.37	365,754.45		2,498,153.92
Military stores for Montana militia	11,792.29			11,792.29			11,792.29
Investigating the mining-débris question in California	3,766.01			3,766.01			3,766.01
Arms and quartermaster's stores for the State of Wyoming	5,666.64			5,666.64			5,666.64
Gunboats on western rivers		23.72		23.72	23.72		
Twenty per cent additional compensation		584.79		584.79	584.79		
Draft and substitute fund		305.58		305.58	305.58		
Extra pay to officers and men composing the escort to the Mexican Boundary Commission		135.33		135.33	135.33		
Expenses of the California Débris Commission		15,000.00		15,000.00			15,000.00
Total miscellaneous	3,095,652.26	4,588,192.34		7,683,844.60	4,456,217.53	187,743.24	3,039,883.83
War claims of States.							
Reimbursing Kentucky for expenses in suppressing the Rebellion		2,015.61		2,015.61	2,015.61		
Reimbursing Pennsylvania for money expended for payment of militia		3,732.50		3,732.50	3,732.50		
Examination of claims of States and Territories under act June 27, 1882	5,689.75			5,689.75			5,689.75
Reimbursing State and citizens of California for expenses in suppressing Modoc Indian hostilities	224.25			224.25			224.25
Refunding to States expenses incurred in raising volunteers		22,603.24		22,603.24	22,603.24		
Total war claims of States	5,914.00	28,351.35		34,265.35	28,351.35		5,914.00
War claims of volunteers.							
Bounty to volunteers, their widows, and legal heirs	55,499.31	430,000.00		485,499.31	351,262.33	35,414.79	98,822.19
Pay of two and three year volunteers	6,786.94	735,243.40		742,030.34	559,281.70	1,659.08	181,089.56
Bounty under act of July 28, 1866	10,283.30	50,000.00		60,283.30	44,909.95	12,775.90	2,597.45
Bounty to Fifteenth and Sixteenth Missouri Cavalry volunteers		575.07		575.07	575.07		
Three months' pay proper		521.70		521.70	521.70		
Horses and other property lost in the military service	1,518.60	44,572.28		46,090.88	44,824.92		1,265.96

Commutation of rations to prisoners of war in rebel States and to soldiers on furlough	1,294.76	30,000.00		31,294.76	9,343.96	3,424.97	18,525.83
Traveling expenses, First Michigan Cavalry		441.28		441.28	441.28		
Traveling expenses, California and Nevada volunteers		533.25		533.25	533.25		
Collecting, drilling, and organizing volunteers		82.53		82.53	82.53		
Services and supplies of Montana volunteers in the Nez Perce Indian war	657.00			657.00			657.00
Pay, transportation, services, and supplies of Oregon and Washington volunteers in 1855–'56		1,152.16		1,152.16	1,152.16		
Rogue River Indian war		471.67		471.67	471.67		
Providing for the comfort of sick and discharged soldiers	1.92			1.92		1.92	
Pay of volunteers, Mexican war		114.83		114.83	114.83		
Extra pay to officers and men who served in the Mexican war		696.71		696.71	696.71		
Capture of Jefferson Davis	1,503.38			1,503.38			1,503.38
Preventing and suppressing Indian hostilities		87.64		87.64	87.64		
Total war claims of volunteers	77,545.21	1,294,492.52		1,372,037.73	1,014,299.70	53,276.66	304,461.37
Erection of monuments.							
Monuments or tablets at Gettysburg			13,286.60	13,286.60			13,286.60
Trenton battle monument, Trenton, N. J	20,000.00			20,000.00	20,000.00		
Statue to memory of La Fayette and compatriots	1.62		101.91	103.53			103.53
Pedestal for statue of—							
Gen. Philip H. Sheridan	50,000.00			50,000.00			50,000.00
Gen. John A. Logan	50,000.00			50,000.00			50,000.00
Gen. Winfield Scott Hancock	49,000.00			49,000.00			49,000.00
Gen. William T. Sherman		50,000.00		50,000.00			50,000.00
Monument at Washington's headquarters, Newburg, N. Y	64.76			64.76			64.76
Total erection of monuments	169,066.38	50,000.00	13,388.51	232,454.89	20,000.00		212,454.89
Repayments in excess of payments					13,388.51		
Actual expenditures					6,611.49		
Relief acts.							
Claims of officers and men of the Army for destruction of private property		685.40		685.40	685.40		
Claims of loyal citizens for supplies furnished during the rebellion	6,939.00			6,939.00			6,939.00
Claims for quartermaster's stores and commissary supplies, act of July 4, 1864	2,046.73	3,612.00		5,658.73	4,212.32		1,446.41
Awards for quartermaster's stores and commissary supplies taken by Army in Tennessee	130.00			130.00			130.00
Stores and supplies taken by the Army (Bowman Act), act of March 3, 1891		59,189.74		59,189.74	59,189.74		
Tents for sufferers from floods in Arkansas, Mississippi, and Louisiana	1.12			1.12		1.12	
Allowance for reduction of wages under eight-hour law		38.65		38.65	38.65		
Relief of destitute citizens, Territory of Oklahoma	44,800.00			44,800.00			44,800.00
Relief of sufferers from overflow of Mississippi River and its tributaries	451.98			451.98		451.98	
Relief of Richard Trabue and others	113.66			113.66	113.66		
Relief of Harriett W. Shacklett		597.00		597.00	597.00		
Relief of Mobile and Girard Railroad Co		2,298.24		2,298.24	2,298.24		

Statement of appropriations uuder direction of the War Department for the fiscal year ending June 30, 1893, etc.—Continued.

Title of appropriation.	Balances July 1, 1892.	Appropriated July 1, 1892, to June 30, 1893.	Repayments July 1, 1892, to June 30, 1893.	Aggregate available.	Payments July 1, 1892, to June 30, 1893.	Carried to surplus fund June 30, 1893.	Balance June 30, 1893.
MISCELLANEOUS OBJECTS—Continued.							
Retief acts—Continued.							
Relief of Samuel Howard		692.00		692.00	692.00		
Relief of A. T. Lee		630.00		630.00	630.00		
Relief of Lydia A. Magill, administrator of John C. McGill		3,706.22		3,706.22	3,706.22		
Relief of Julius C. Zanone, heir of John B. Zanone		4,525.00		4,525.00	4,525.00		
Relief of First Methodist church of Jackson, Tenn		3,750.00		3,750.00	3,750.00		
Relief of James B. Blue, administrator of Solomon Blue		672.50		672.50	672.50		
Relief of Clement Reeves		627.85		627.85	627.85		
Payment to Oregon Improvement Company for damages		448.15		448.15	448.15		
Relief of Richard M. Edwards		2,063.70		2,063.70	2,063.70		
Relief of Mary Kellogg, widow of Spencer Kellogg		126.13		126.13	126.13		
Relief of Fannie N. Belger		4,679.17		4,679.17	4,679.17		
Relief of William and Mary College, Virginia		64,000.00		64,000.00	64,000.00		
Relief of Nemiah Garrison, assignee of Moses Perkins		750.00		750.00	750.00		
Relief of J. P. Randolph, administrator of J. G. Randolph (deceased)		246.70		246.70	246.70		
Awards to certain citizens of Jefferson County, Ky		1,472.00		1,472.00	1,472.00		
Total relief acts	54,482.49	154,810.45		209,292.94	155,524.43	453.10	53,315.41

RECAPITULATION.

Salaries, contingent expenses, and postage	$66,620.06	$2,033,112.45		$2,099,732.51	$1,992,581.95	$49,046.58	$58,103.98
Military Establishment, Army and Military Academy	3,091,646.14	25,093,871.49	12.00	28,185,529.63	23,377,840.35	1,054,226.42	3,753,462.86
Public works	18,591,976.78	41,089,275.80	4,128.34	59,685,380.92	20,522,759.75	17,975.34	39,144,645.83
Miscellaneous objects	3,564,034.41	6,566,321.90	14,240.38	10,144,596.69	6,091,273.56	287,666.81	3,765,656.32
Total	25,314,277.39	74,782,581.64	18,380.72	100,115,239.75	51,984,455.61	1,408,915.15	46,721,868.99
Repayments in excess of payments					18,380.72		
Actual expenditures					51,966,074.89		

REPORT

OF THE

MAJOR-GENERAL COMMANDING THE ARMY.

REPORT

OF THE

MAJOR-GENERAL COMMANDING THE ARMY.

HEADQUARTERS OF THE ARMY,
Washington, D. C., October 4, 1893.

SIR: I have the honor to submit with this my annual report the reports of the commanding generals of the several geographical departments, including those of their chief staff officers, of the commanding officers of the Artillery School, the Infantry and Cavalry School, and those of the Adjutant-General and the Inspector-General of the Army. The annual report of the commanding officer of the Cavalry and Light Artillery School at Fort Riley, Kans., will be submitted later, when the season of practical instruction at that place has been completed. These reports give full information of all the operations of the troops during the past year, of the administrative work of the several staff officers serving with troops, and of the stations and strength of the various organizations of the Army and of the state of discipline and instruction of the troops, including practice with small arms and artillery. These reports, together with those of the Chief of Engineers and Ordnance, of the administrative staff departments, and of the Superintendent of the Military Academy, will give you full information of all the details of the military service. I think it better not to epitomize or make extracts from any of these reports, but rather to invite their full perusal.

IMPORTANT SERVICES.

The most arduous service which has been rendered by the troops during the past year, and in some sense the most important, has been that required to suppress and punish violations of the neutrality laws between this country and Mexico. This service required a considerable addition to troops before stationed in the Department of Texas, and to prevent a recurrence of such lawless acts it may be found necessary to continue the increase thus made of the force serving in that department. The report of the department commander gives full details of all the service rendered, and shows that the troops were finally entirely successful, after a most laborious pursuit, in breaking up and capturing the criminals who had been engaged in violating the hospitalities of this country for the purpose of conducting lawless enterprises against our friendly neighbor. I regard the troops in the Department of Texas as deserving of high commendation for the manner in which they have discharged this arduous duty.

Happily the Army has not been called upon during the past year to assist in the suppression of domestic violence in any part of the Territories of the United States. But in connection with the opening of the new Territory of Oklahoma the troops have been called upon to aid the civil authorities, and the service thus performed has been commendable.

INSTRUCTION AND DISCIPLINE.

The state of discipline of the Army continues to be satisfactory. Military instruction has been conducted throughout the year as prescribed in Regulations and Orders. Firing instruction, both with heavy guns and small arms, has been systematically conducted during the year, and the efficiency of the Army in this respect has probably never been so high as now. An additional year has been given for the trial of the new drill regulations for infantry, cavalry, and light artillery with a view to the most careful and extended criticism of every detail before the final revision of the text and its adoption as a permanent system.

SMALL ARMS AND FIELD ARTILLERY.

The reconsideration provided by Congress of the former decision of a board appointed by the War Department to select a small arm for the use of troops, having finally resulted in the confirmation of the judgment of the former board, the work of construction of the new arm is now in progress, so that the Army may be equipped with the modern magazine weapon in due time. It is again respectfully suggested that a reserve supply of the most approved infantry rifles and of the standard breech-loading rifled field guns be provided in amount sufficient, not only for the regular troops and organized militia, but for such volunteers as may be immediately called into service in the event of war.

FORTIFICATION AND ARMAMENT.

Satisfactory progress has been made during the last year in the fabrication of modern high power guns, and considerable work has been done in providing emplacements for such guns and mortars. Experiments have also been continued in respect to disappearing carriages for such guns. Conclusive results in this last regard have not yet been reached, but yet such progress has been made that efficient carriages could be rapidly constructed in case of immediate need. It is hoped that necessary appropriations for the continuation of this work will not be withheld, so that the policy which has now been steadily pursued during the past five or six years may be continued until the great seaports of the United States are placed in condition of security.

The report of the Board of Ordnance and Fortification, and those of the Chief of Engineers and the Chief of Ordnance, will give you full information of all the business transacted in respect to fortifications and armament, and the future needs of the military service in that regard.

BARRACKS AND QUARTERS.

I desire again to invite attention to the necessity for a special appropriation for the construction of barracks and quarters at those seaport stations from which the troops were withdrawn for field service

some years ago. Many of those posts have now become defenseless and unfit to occupy in their present condition. It is believed that all important seaports should be regarrisoned, their present armament placed in serviceable condition, and preparation made for the care of new and improved armament as soon as the Engineer and Ordnance Departments are able to supply them.

REORGANIZATION OF THE ARTILLERY AND INFANTRY.

The measures which for many years have been before Congress, and favorably considered at one time or another by each House, for the reorganization of the artillery and infantry, still remain under consideration. So much has been said in favor of these measures and their merit so generally admitted, that it would be superfluous to discuss them further. I trust Congress may be pleased to enact those measures into law without unnecessary delay.

MILITARY EDUCATION.

The interest in military education throughout the country continues to increase. The demand for educated officers for duty at colleges and universities and other institutions of learning is constantly increasing, and no better service could be rendered in time of peace by officers of the Army than such assistance in the general dissemination of military instruction. In the permanent establishment, education was never so general or so high as at the present time. Not only are the established schools at West Point, Willets Point, Fort Monroe, Fort Leavenworth, and Fort Riley, as efficient as ever, but the Military Service Institution and the general system of lyceums established throughout the Army are adding largely to the voluntary individual work of nearly all officers of the Army. The post schools for enlisted men still need development, and some generous legislation will, it is believed, be requisite to put them upon the proper basis.

INDIAN SOLDIERS.

The enlistment of Indians in the Army, and their organization into companies attached to the regular regiments, appears thus far to have accomplished, in a very satisfactory manner, the principal objects contemplated in that policy. The principle of these objects is understood to have been for the purpose of withdrawing from the warlike tribes and giving satisfactory employment to a considerable number of young men who were generally dissatisfied and liable at any time to become hostile; for the purpose of educating the Indians in the rules and customs of civilized as contrasted with those of savage warfare; and to assist in the efforts of the Government to transform the Indian character from that of savage enemy to that of friend and citizen of the United States. There has been no serious indication of hostile disposition manifested by any of the Indian tribes since this policy was inaugurated.

A secondary object was the organization of a comparatively small contingent of Indian troops; partly with a view to any service which might be required of them, but mainly for the purpose of determining by actual trial what the value is or may be made of the warlike tribes of Indians as a part of the military strength of the United States; this upon the general theory that all parts of the people of a country should

be prepared to do their share in time of need of the military service which the country may require. It is yet too early to reach a final conclusion upon this question. Results vary from one extreme to the other. In some cases the Indian troops have proved highly satisfactory. In others, less so. In one case, the discipline of a company was so unsatisfactory that it was thought necessary to remove it from its native country, where it might possibly do serious harm, to a distant State and into the presence of a garrison of white troops, where its power for evil was entirely paralyzed. By this and similar means the tribe to which that company belonged, which had been one of the most dangerous of all the savage tribes, has been reduced to a comparatively harmless condition. In some other cases it has been found that tribes formerly warlike have by contact with civilization lost their military character, and that they may be counted as of no military consequence, either for or against the United States. In those cases the companies have been disbanded. Further trial will doubtless indicate satisfactorily what tribes and to what extent may wisely be called upon to furnish any part of the military force of the United States, with a view to future service, and to what extent Indians may wisely be retained in service, with a view solely to discipline and control, for the purpose of preventing their employment in any hostile enterprise against the people of the surrounding country.

In view of the very limited strength of the Army authorized by law, only a small fraction of that strength can be utilized in the manner herein referred to; but within that limit it is far more economical, as well as more humane, to employ the Indian as a civilized soldier than to fight him as a savage warrior. Perhaps, in the end, the most valuable of all the results of this policy will be in its conviction of the Indians, by means which appeal to them most forcibly, of the fact that they are not regarded as enemies, but as a part of the people of the United States.

TERM OF ENLISTMENT.

In an army so small as that permanently maintained by the United States the all-important requisite is efficiency and reliability under any and all circumstances that may arise. To secure this it seems evident that the policy should contemplate the elimination, as soon as practicable, of all men who can not be molded into perfectly trustworthy soldiers and the retention in service of all whose military development proves to be entirely satisfactory. The period of five years—that of the present term of enlistment—is much longer than necessary for the first purpose, while the limit of length of service under existing law, namely, ten years, is much too short to enable the Government to obtain the best service from men who have proved to be in all respects satisfactory.

There is another serious objection to the present limitation of ten years. That period is much too long for a young man to devote to the military service if he must ultimately make his career in civil life. He thereby loses the opportunities of youth which must be availed of by all young men who would win success in the race of life.

The benefits to the country from the military training of the small number of men who are discharged after ten years of service is quite insignificant. They do not amount to as many as one in four thousand of the arms-bearing population of the United States. In a country whose policy is based upon universal obligation to military service and

the development of the ultimate military strength of the nation, and where a large standing army is maintained, partly as a school in which all young men capable of bearing arms may be trained, a short term of active service, generally of three years, enables the Government to give that training to every young man capable of bearing arms. In our country the Army is far too small to serve as a valuable training school of this character. The organized militia of the several States serve such a purpose to a much better advantage without drawing young men away from their civil avocations.

It therefore seems advisable that the term of enlistment in the regular service in this country be reduced from five to three years, and that the legal restriction upon reënlistments be removed, so that the War Department may be at liberty to continue in service those enlisted men whose services are found to be valuable.

No doubt heretofore the practice has been to reënlist old soldiers after they have become less efficient than when they were younger, but that practice may readily be controlled by Executive action. It can not well be done by legislation, except by shortening the term of first enlistment, so as to afford a ready means of eliminating all those who will not, by the value of prolonged service, probably acquire any claim to further consideration in that regard.

A reduction of the first term of enlistment to three years would also, in a large measure, remove the reason for the existing law providing for the purchase of discharge, which latter has proved very prejudicial to military discipline. As soon as a young soldier has saved up money enough to purchase his discharge he esteems himself independent of his commanding officer, and becomes restive under necessary discipline, since all he has to do to avoid further submission to such discipline is to buy his discharge. It would, in my judgment, be beneficial to the military service to repeal the law authorizing the purchase of discharges.

THE RECRUITING SERVICE.

The recruiting service has been ably conducted by the present Adjutant-General, Brig. Gen. Robert Williams, and his subordinate officers, and the improvements noted in my last annual report have been continued. The services of the Medical Department and the detection and rejection of unworthy or undesirable recruits have been greatly beneficial. Great difficulty is necessarily encountered in obtaining recruits who fulfill all the very high qualifications established, and which should be maintained in so small an army as that of the United States, and unworthy applicants, through fraud or otherwise, sometimes gain admission; but their unfitness, from whatever cause, is generally very soon detected, so that they may be dismissed at the depots before being sent to regiments. Although recent favorable legislation and other causes have diminished to a considerable extent the proportionate number of desertions from the Army, that number still continues large, and doubtless from causes entirely beyond control, unless it be by increasing the certainty and severity of the punishment for desertion.

STAFF DEPARTMENTS.

The officers of the Adjutant-General's and Inspector-General's Departments have discharged the duties which have devolved upon them under my orders with great zeal and fidelity. I also take pleasure in

acknowledging my obligations to all the staff departments for their cordial assistance in the discharge of the duties devolving upon me. The department commanders and their staff officers and all the troops of the line have merited my commendation by the manner in which they have discharged their duties.

I have the honor to be, sir, your obedient servant,

J. M. SCHOFIELD,
Major-General, Commanding.

Hon. DANIEL S. LAMONT,
Secretary of War.

REPORTS

TO THE

MAJOR-GENERAL COMMANDING THE ARMY.

REPORT OF THE ADJUTANT-GENERAL.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, September 27, 1893.

GENERAL: Pursuant to your instructions, I have the honor to submit the annual returns of the Army:

A.—Showing the actual strength of the Army June 30, 1893.

B.—Showing position and distribution of the troops by departments, taken from the latest returns on file in the Adjutant-General's Office.

C.—Geographical departments and posts, with distribution of troops, post-offices, telegraph stations, and nearest railroad stations and boat landings.

D.—Statement showing gain and loss in the enlisted strength of the Army during the fiscal year ended June 30, 1893.

The number of enlisted men now in service, June 30, 1893, who are drawing increased pay under the act of Congress of August 4, 1854, is as follows:

Five years' continuous service ($2 per month)	4,248
Ten years' continuous service ($3 per month)	1,791
Fifteen years' continuous service ($4 per month)	960
Twenty years' continuous service ($5 per month)	672
Twenty-five years' continuous service ($6 per month)	212
Thirty years' continuous service ($7 per month)	12
Thirty-five years' continuous service ($8 per month)	2
Forty years' continuous service ($9 per month)	1

The number of those who will become entitled to increased pay under the act of Congress of May 15, 1872, during the fiscal year ending June 30, 1895, is:

Reënlisted pay	386
One dollar per month for third year of service	5,711
Two dollars per month for fourth year of service	4,296
Three dollars per month for fifth year of service	3,113

And the number of enlisted men whose terms will expire during the fiscal year ending June 30, 1895, is 2,117.

THE MILITARY PRISON.

The annual report of the commandant of the military prison and the reports of the other officers on duty thereat (submitted herewith) show, in detail, the management of the affairs of that institution during the

year, and indicate that the important duties of the commandant and of his officers have been performed in a satisfactory manner.

The number of prisoners in confinement June 30, 1892, was 395; the number received during the year, 361; and the number lost by discharge, etc., 298, leaving 458 in confinement June 30, 1893, an increase of 63.

The provost guard numbers 99 men, leaving 26 vacancies, which it is desirable should be filled by voluntary transfers from the line of the Army.

The appropriation for the year ended June 30, 1893, was $80,080, of which $72,027.40 was expended; this amount includes the expenditure of $930 for donations of $5 each to 186 prisoners released from confinement at Alcatraz Island, Cal., and other military posts, leaving the actual expenditures of the prison $71,097.40, a decrease in expense with an increase of 63 prisoners, showing clearly the economic administration of the affairs of that institution. In addition to the donations of money above mentioned, the prison furnished 235 suits of civilian clothing for prisoners released from confinement at military posts.

Under the authority of the Secretary of War, the change from the dormitory to the cellular system has been steadily going on, and there are now 400 cells at the prison and 44 more in course of construction.

The yield of the prison farm was larger than the preceding year, and was as follows: Two thousand four hundred bushels of corn; 2,244 bushels of potatoes; 65,999 heads of cabbage, and 3,651 bushels of various other kinds of vegetables, which, added to the regular rations, provided an ample variety of good food.

The prison-mess fund had $2,233.30 to its credit June 30, 1892. The amount saved during the year from the rations was $7,933.95, and the amount expended was $7,826.28, leaving $2,342.97 on hand June 30, 1893.

The various industries were carried on in a satisfactory manner and the prisoners appear to have been usefully employed.

Some of the principal articles manufactured during the year were 28,267 pairs of shoes, 174 mess tables, 1,594 mess stools, 748 sets of harness, 4,683 tin boilers, steamers, coffeepots, teakettles, stew pans, etc., 14,790 joints of stovepipe and elbows, 20,000 corn brooms, 50 coats, 320 pairs of trousers, and 45 shirts.

The total number of days of skilled labor performed by the prisoners was 47,127, and the number of days of unskilled labor 78,364. Of this 27,755 days of skilled labor and 25,647 of unskilled labor were performed for the quartermaster's department, amounting in value to $22,853.95.

It is also noted that 90 cords of wood and 19,000 feet of lumber were cut by the prisoners and 160,000 bricks made for use at the prison.

The prision fund (made up from various earnings of the prisoners' labor and from the sale of miscellaneous material) amounted to $1,590.57 and was turned in to the United States Treasury.

Thirteen prisoners escaped and 11 were captured during the year. The large number recaptured is believed to be due to the increase of the reward from $30 to $60.

The report of the attending surgeon shows that one prisoner died during the year and that one member of the guard committed suicide.

Special attention has been given to the night school, and much has been done to afford prisoners such educational advantages as are possible, with the gratifying result that the number of scholars has

increased from 100 to 236—a decided step in the direction of making the prison a true reformatory.

DESERTION.

The number of desertions from the Army reported as having occurred during the fiscal year ended June 30, 1893, is 1,682, an increase of 300 over the number reported for the preceding year.

This increase has been attributed in part, in some of the reports, to the widespread dissatisfaction in the ranks resulting from the law which, by limiting the possible length of service to ten years, deprives the enlisted men of the future advantages which they had the right to expect were guaranteed to long and faithful service. This view is strengthened, in my opinion, by the fact that the reported increase is almost evenly distributed among seven of the eight military departments; in the department of California alone is a decrease reported.

While the gravity of desertion is fully appreciated, and it is held that punishment for this military crime should both be swift and adequate, I am nevertheless of opinion that the morale of the rank and file of the Army is undoubtedly good and that its members will bear comparison with an equal number of men of the same class in other occupations and pursuits.

DISCHARGES.

Section 2 of the act to prevent desertions from the Army, etc., approved June 16, 1890, reads as follows:

> SEC. 2. That enlistments shall continue to be made for five years, as now provided by law: *Provided*, That at the end of three years from the date of his enlistment every soldier, whose antecedent service has been faithful, shall be entitled to receive a furlough for three months, and that, in time of peace, he shall at the end of such furlough be entitled to receive his discharge upon his own application: *Provided further*, That soldiers discharged under the provisions of this section shall not be entitled to the allowances provided in section 1290 of the Revised Statutes.

While section 4 of the same act, permitting enlisted men to purchase their discharge in time of peace, benefits both the Army, by eliminating from its ranks men unsuited for its life, and the individual, by offering him an honorable means of severing his connection with a service for which unfitted, section 2, on the contrary, benefits the individual at the expense of the Army, and, practically, offers a bonus to good men to leave the service after a reduced term. It was thought that the indulgence of a three-months' furlough after three years' service would generally operate in securing the continuance of the man in the military service. This assumption is disproved by the fact that, of 939 men so discharged in 1891, 1,452 in 1892, and 1,573 in 1893—a total of 3,964—only 94 men in 1892 and 453 during the past fiscal year sought reëntry into the army. The total number (547) offering themselves for further military service was only a fraction over 13 per cent of the whole number discharged under the provisions of the law. It is evident, therefore, that as a means of inducing men to continue in the military service the law lacks potency, and that its greatest effect is to entail on the Army the expense incident to filling the vacancies in the ranks created by the discharge of three-years' men. Excluding all consideration in regard to faithful antecedents, the average number of men during the past three years who were entitled to claim discharge was 3,329, and the percentage of successful applicants, which in 1891

was 29, advanced to 41 in 1892 and reached 49 during the past fiscal year.

Carefully prepared statistics place the cost of a recruit at depot, exclusive of clothing and subsistence, at $18, and that of a recruit delivered at regiment, after three months of instruction at depot, at $165. The 1,573 men discharged after furlough during the fiscal year ended June 30, 1893, received, say, $50 for pay and allowances during such furlough, or a total charge of $88,650 against the military appropriations. The first cost of enlisting an equal number of recruits would be $28,314, or, if the recruits are kept three months at depot before being sent to the regiments needing them, $259,545.

The effect of the law, as it now stands, is to take good men from the ranks at the end of three years (and then to give them three months' furlough, during which time their places can not be filled and their pay runs on) and to retain bad men for five years.

For these reasons and with a view to the best interests of the Army and of strict economy in military expenditures, I beg to recommend the repeal of section 2 of the act of June 16, 1890, and that the term of enlistment be fixed at three years, so that bad men as well as good may be discharged alike at its expiration; and that the term during which an enlisted man may reënlist, with increased pay, be established at three months instead of one, as now provided by law. The effect of this will be to give to the soldier his three months' absence, without expense to the Government and without burdening the rolls, as at present, and to enable him at its expiration to reënlist, with pay, as though he had been continuously in service.

FRAUDULENT ENLISTMENT.

Until the date of the act of July 27, 1892, declaring fraudulent enlistment a military offense, punishable under the sixty-second article of war, no legal means existed to punish the men—undesirable, if not worthless—who forced themselves in the ranks by concealment of disqualifying facts or defects.

The "identification card" system of the surgeon-general's office has proved an excellent means of detection and the act, above cited, has provided legal method of prevention. Under the working of both the system and the law 301 men were dishonorably discharged during the past year for fraud perpetrated by them in their enlistment. As the number of men discharged for the same cause during the preceding year was 394, it is evident that fewer men of that obnoxious class found their way in the ranks of the Army, and, while it can not be ascertained how many were led to keep away by fear of the law, it is confidently hoped that its deterrent nature will, as it becomes more and more generally known by the representations of recruiting officers, eventually eliminate that most demoralizing element from the ranks through fear of an almost inevitable detection, to be followed by swift and condign punishment.

REËNLISTMENTS.

The act approved February 27, 1893, making appropriations for the support of the Army, contains the following clause:

> And, hereafter, in time of peace * * * no private shall be reënlisted who has served ten years or more, or who is over 35 years of age, except such as have already served as enlisted men for twenty years or upward.

While the theoretical object of the law was undoubtedly to disseminate military knowledge among the people by limiting service in the ranks of the Army to ten years, practically, the end in view can never be reached by that means, for many reasons, two of which are the voluntary system of recruiting the ranks and the insignificant relation, for the purpose, of the number of enlisted men in the Army to a population of 70,000,000 people. This provision of law, moreover, is directly antagonistic to the best interests of the military service and has been promotive of more dissatisfaction than any measure that has been introduced for years. Its effect is to discourage enlistments, reduce reënlistments after five years, and cause, in the near future, the bulk of the Army to consist of inexperienced young men instead of, as it should be, well-trained soldiers.

Many petitions have been received from every part of the Army, signed by officers and men, urging the repeal of the obnoxious clause of the law cited above, for the following reasons:

(1) Because the men enlisted under laws guaranteeing them an honorable status and reasonable support after thirty years' service, or admission into the Soldiers' Home after twenty years or on discharge for disability incurred in the service. For the support of the Home a monthly reduction has been made in their pay during their entire service. Both of these promises—moral contracts—are broken by the present law.

(2) The law goes counter to all experience in denying the value of special training. Any private enterprise adopting such a plan would court loss and disaster, and like results must follow its adoption in the Army.

(3) The inevitable result of the enforcement of the law will be to fill the ranks with fickle men of roving disposition and drive away men fond of the military profession.

The points made in these petitions are well taken and are fully concurred in. The law, however well intended in theory, is positively hurtful to the Army as well as unjust to the men in the ranks.

It is harmful to the Army because it tends directly to eliminate from the ranks a class of men thoroughly trained, imbued with military spirit, and of good character, for otherwise they would not have been retained. While a few veterans in a company, by their presence and example, teach the new men the important lesson of obedience, fidelity, and intelligent performance of duty, it takes a long time to make good soldiers of a company composed entirely of recruits. The great value of veteran regulars was thoroughly shown at the outbreak of the civil war. The positive injustice it works to the men in the ranks is clearly pointed out in the first point of the petitions. In addition to all this the law, if unrepealed, will entail increased expenses for keeping the ranks full. The statistics of the Army since 1880 show an average presence in the ranks of 2,772 men with a service of ten and less than twenty years, and if this class of trained soldiers is not to be permitted to continue in the service the replacement of the men necessarily means an increase of the recruiting expenses.

The best interests of the service, justice to the men in the ranks, and economy in expenditures alike demand the repeal of the clause in the law of February 27, 1883, which forbids the reënlistment of men after ten years' service.

PAY OF NONCOMMISSIONED OFFICERS.

The question of proper and reasonable pay commensurate with the responsible duties devolving on the noncommissioned officers of the Army is deemed by me one of such vital importance to the military serv-

ice as to fully justify again presenting the matter for the favorable consideration of the War Department and of Congress.

It is true that, with regard to the first sergeants and sergeants, Congress has partially recognized the force of the recommendations heretofore made, and by the act of February 27, 1893, has increased the pay of the former from $22 to $25 and that of the latter from $17 to $18; but this slight increase, while justly due to the two classes of noncommissioned officers benefited, disturbs the universally accepted rule that rank or position, by reason of the relative importance of rank and duties, shall receive proportionate compensation. Military rank without adequate pay is belittled and robbed of much of its proper value. In the lower military hierarchy the sergeant-major heads the noncommissioned officer class, and justly so. His duties are both important and responsible, and the position demands the highest type of the enlisted man in intelligence, acquirements, and soldierly bearing, and yet his present pay is $2 less than that of a first sergeant, his military subordinate. I earnestly recommend that the whole subject be again brought to the attention of Congress with a view to the establishment of a just scale of remuneration for each and all of the several grades of noncommissioned officers. As I had the honor to state in my last report: "Such a measure is demanded alike by regard for the greatest efficiency of the Army, justice to the men whose pay is inadequate to their rank and duties, and for the creation of a soldierly rivalry among the enlisted men in the ranks to earn advancement to even the lowest grade in that honorable class."

POST LYCEUMS.

The reports received evidence creditable and sustained progress in the course of instruction, and that it has been followed during the past year with commendable zeal in professional study. The publication of the best monographs, having regard to both the importance of the subject selected and the lucidity and force of treatment, would, it is not doubted, act not only as a powerful stimulus to study and research in the broad field of military science, but also prove of great interest to the entire service. And I beg, therefore, to recommend that copies of these papers be hereafter required to be forwarded to this office and that the most meritorious be published to the Army.

POST EXCHANGES.

The post exchange system continues to progress satisfactorily, and notwithstanding periodical misrepresentations assailing it, is considered by the majority of officers, including post commanders, as having a decidedly beneficial influence on the discipline and morals of the rank and file of the Army. There is no reason to doubt that, as time and experience indicate what additional measures should be adopted in order to perfect the management and conduct of post exchanges, the system will be regarded more and more as a happy substitute for the old post-trader establishment with its train of almost ineradicable evils, and that it will fully realize the benefits anticipated at its adoption.

POST LAUNDRIES.

As the enlisted man of the Army is now required to wear many more articles of clothing requiring washing than formerly and under im-

proved hygienic conditions in barracks is furnished sheets and pillow-cases, it follows as a matter of course that his bill for washing of white blouses, trousers, linen collars, and bed furniture is much heaver than formerly, and that, receiving no increase in pay or allowances, the burden of increased expenditures falls heavily upon him, and this more especially in southern latitudes, where a more frequent washing of the above articles is an imperative necessity. The troops are required to keep the authorized duck clothing and bed furniture in neat and clean condition, and this necessary requirement involves a considerable increase of the monthly wash bill. In justice to the men this expenditure should be reduced to the minimum, and I therefore recommend that as rapidly as possible post laundries, under proper management, be established at all permanent posts.

The law prohibits company laundresses, so that the men are compelled to get their laundry work done the best they can, and it seems proper that the Government should afford them all possible facilities, at the least expense to the men, for presenting a neat and soldierly appearance on all occasions. This condition involves not only the comfort but the health of the troops.

RECRUITING SERVICE.

The manner of conducting the recruiting service, general and special, during the past year has not materially differed from that explained in the last two annual reports of the Adjutant-General; but special efforts have been made during the greater part of the year, by means of more systematic advertising and increased personal effort on the part of recruiting officers, to secure recruits in greater number without relaxing in any degree the high standard of qualifications required.

GENERAL RECRUITING.

The superintendent of the general service has his headquarters at New York City, and depots for the collection and instruction of recruits have been continued at Davids Island, New York Harbor, and Columbus Barracks, Ohio, for infantry and heavy artillery, and at Jefferson Barracks, Mo., for cavalry and light artillery.

October 1, 1892, recruiting rendezvous were in operation at the following places: Three in the city of Chicago, Ill.; two, each, in the cities of Boston, New York, and Philadelphia; and one, each, at Springfield, Mass., New Haven, Conn., Albany, Brooklyn (a branch of New York City), Buffalo, and Rochester, N. Y.; Camden and Newark, N. J.; Harrisburg, Altoona, and Pittsburg, Pa.; Cincinnati and Cleveland, Ohio; Evansville, Fort Wayne, Indianapolis, and Terre Haute, Ind.; Springfield, Ill.; Detroit and Grand Rapids, Mich.; Milwaukee, Wis.; Davenport, Iowa; St. Paul and Minneapolis, Minn.; St. Louis, Mo.; Louisville, Ky.; Nashville, Chattanooga, and Knoxville, Tenn.; Port Gibson, Miss.; Wheeling, W. Va.; Baltimore, Md.; Washington, D. C.; San Francisco, Cal.; and Seattle, Wash.

In November, 1892, the rendezvous at Altoona, Pa., and Port Gibson, Miss., were transferred to Toledo, Ohio, and Memphis, Tenn., respectively, and in May, 1893, a rendezvous was opened in Lynchburg, Va.

Rendezvous were closed during the year as follows: At Terre Haute, Ind., and Davenport, Iowa, in February, 1893; at Memphis, Tenn., in March, 1893; at Wheeling, W. Va., Fort Wayne, Ind., and Springfield, Ill., in May, 1893; and one, each, at Boston and Philadelphia in June,

1893. In connection with the regular rendezvous, temporary branch rendezvous were conducted from time to time, as circumstances required, until August, 1893, when all temporary branches were closed.

During the month of August it became necessary, owing to the largely increased number of applicants for enlistment, undoubtedly due, in a great measure, to the general business depression, to place restrictions upon recruiting for the general service and to instruct the recruiting officers in the various cities to make careful selection, from the best class of applicants, of the most promising material, with a view to securing an exceptionally fine class of recruits.

SPECIAL RECRUITING.

The departmental, the ordinary regimental, and the engineer recruiting services, which are conducted at military posts without expense to the recruiting appropriation, have continued to furnish a considerable portion of the recruits required; but it is remarked that the enlistments without expense to the recruiting fund for the fiscal year ended June 30, 1893, were 870 less than during the preceding fiscal year.

The special regimental recruiting service, which seeks its recruits through the efforts of traveling recruiting parties detailed by the respective regimental commanders to operate within a certain district or territory allotted to each regiment, has been prosecuted with renewed vigor and marked success. During the fiscal year ended June 30, 1893, 8 cavalry regiments, the 5 artillery regiments, the light artillery battalion, and 16 infantry regiments (30 organizations in all), had recruiting parties in the field, maintaining rendezvous for a greater or less time in 270 different places, besides actively canvassing the country surrounding these rendezvous. As a result, 1,590 recruits were enlisted during the year, the largest number yet obtained by this means in any one fiscal year. It is apparent from the foregoing that the special regimental recruiting service has become indispensable as one of the methods to be relied upon in recruiting the Army, and that it is the duty of regimental commanders, whenever circumstances will permit, to make earnest efforts to supply a portion of the recruits required by their regiments by this system of recruiting, which is fully explained in Circulars No. 7 of 1892 and No. 21 of 1893 from this office.

INDIAN ENLISTMENTS.

The whole number of Indian soldiers enlisted up to June 30, 1893, was 963, of whom 126 were enlisted during the fiscal year ending with that date. During the past year the members of four Indian companies whose organization had not been completed have been discharged and these Indian organizations discontinued. A number of other discharges of Indian soldiers have also been made for various causes under the provisions of existing law. There are now in service 15 Indian companies, viz: 6 troops of cavalry and 9 companies of infantry.

RESULTS.

The recruits enlisted during the fiscal year ended June 30, 1893, were sufficient to meet all current losses and, besides, to add 600 men to the strength of the Army. The total number of enlistments in the

Army for the year ended June 30, 1893 (excluding those not embraced in the legal limit of 25,000 men), was 9,074, classified as follows:

For the general recruiting service	5,107
For the departmental recruiting service	865
For the special regimental recruiting service	1,590
For the engineer battalion	93
	7,655
For regimental detachments, etc.	1,419
Total	9,074

Of the 9,074 accepted recruits, 6,306 were native born and 2,768 of foreign birth; 8,151 were white, 797 colored, and 126 Indians.

The reports show that the recruiting officers making the 7,655 enlistments embraced in the first four items of the foregoing list rejected 19,083 applicants (71 per cent of the whole number seeking enlistment) as lacking the necessary qualifications—either physical, mental, or moral—a clear indication that, as a rule, the officers charged with the responsible duty of recruiting have taken proper precautions to prevent the enlistment of men unfitted from any cause for the duties of a soldier.

The difficulties attending the enlistment of men fulfilling the exacting conditions of the recruiting regulations may be inferred from the large percentage of applicants for admission to the ranks of the Army who have been rejected during the year; but, notwithstanding careful application of the most rigorous tests, many undesirable men have succeeded in entering the service. The purpose of this office, however, has been to draw recruits from the body of the people and thereby cull men, not only endowed with superior physical qualifications, but who would add respectability to the squad room and bring a large degree of conscience to the performance of their duties.

In pursuance of this aim several experimental methods have been practically investigated and, among others, systematic newspaper advertising has been extensively employed. In one instance, a recruiting district in New England, embracing a population of more than three millions, was allotted to a single regiment, and a general advertisement inserted in 38 newspapers setting forth the necessities of the Army and the advantages of enlisting therein. The expectation of favorable results, based upon the idea of a small number of enlistments at a large number of places, was entirely disappointed, for three months' persistent effort and continuous advertising resulted in the enlistment of only 7 men. In the West a similar experiment was even more futile, as an audience of quite five millions, under like conditions, yielded no recruits. It is not the purpose of this report to attempt to establish a connection between these exceedingly discouraging results and their primary causes further than to invite attention to the fact, which has been well demonstrated, that the newspaper press, as a material means of assisting in the recruitment of the Army, has not proved a success.

Respectfully submitted.

R. WILLIAMS,
Adjutant-General.

Maj. Gen. JOHN M. SCHOFIELD,
Commanding the Army.

MILITARY PRISON REPORTS.

COMMANDANT'S OFFICE, UNITED STATES MILITARY PRISON,
Fort Leavenworth, Kans., July 25, 1893.

SIR: I have the honor to transmit herewith annual reports of the prison surgeon, chaplain, executive officer, commissary, commanding officer of the guard, and prison quartermaster, together with the various tabulated statements, showing the number of prisoners received, discharged, etc., the offenses for which tried, age, nativity, occupation, etc.; also the amount of work performed by them.

Since my last report the following changes in the officers on duty at the prison have taken place: Capt. F. Von Schraeder, assistant quartermaster (promoted from first lieutenant, Twelfth Infantry), relieved and replaced by First Lieut. George B. Davis, Fifth Infantry, since transferred to the Fourth Infantry.

The work of improving the prison and its surroundings has steadily progressed during the year just passed, and the following are among the chief improvements made:

(1) New floor laid on second floor of new building.
(2) New floor laid on upper floor of building No. 1.
(3) New floors laid on first and second floors of building No. 2.
(4) New floor laid in guard room at prison entrance.
(5) Floors repaired in guard's kitchen and dining room; also in prison bakery, and wherever necessary.
(6) Vitrified brick floor laid in prison stables.
(7) Ventilator shafts in prison dormitories, connecting with each floor, were placed and are nearing completion.
(8) Iron ventilators were placed in dry room of laundry.
(9) New system of ventilation, under plans of the prison surgeon, to ventilate the three floors of the new building which contains the dormitories over the prisoners' mess hall, now in course of construction.
(10) Galvanized iron hoods placed over cooking vessels in kitchens of guard and prisoners, to carry off surplus and escaping steam.
(11) New washbowls placed in guard's wash room.
(12) New wash sinks placed on first and second floors of building Nos. 1 and 2 for prisoners' use.
(13) A new rotary bake oven was placed in the prisoners' kitchen, for the baking of meats, etc.
(14) New wash and earth closet room, constructed for the use of sick in guard's ward of hospital.
(15) New flagstones laid in bakery.
(16) New raised tin roof put on stables of commandant and surgeon.
(17) New raised tin roof put on shop building.
(18) Interior of chapel remodeled; old ceiling taken off and new one put up close to the rafters, raising roof about 8 feet, finished off with hard wood, oiled. Window cut in northwest end. New wainscoting. The necessary painting and calcimining done. New pulpit furniture manufactured.
(19) Electric lights placed in new schoolroom, also new desks, affording facilities for 250 scholars.
(20) Brick walk laid from prison to quarters occupied by enlisted men and employés north of prison and along both sides of village street.
(21) Culverts made and drainage of grounds perfected around Missouri Pacific depot.
(22) All cisterns cleaned.
(23) All the gutters repaired.

(24) Open privies at quarters filled up and replaced by boxes.
(25) All necessary repairs made to drainage system, to steam, and to water supply.
(26) All necessary repairs, painting, calcimining, etc., done to all buildings.
(27) Forty-four new iron cells built in building No. 1.
(28) Forty-four new iron cells built in building No. 2.
(29) Ninety new iron cells built in building No. 4.
(30) All steam heating pipes in prison yard placed in tunnels.
(31) Water supply extended north of prison yard for use in case of fire.
(32) Roads on the reservation, outside the immediate post, repaired; macadamized road to new quarry partly finished.

The following exhibit shows the appropriations and expenditures therefrom during the fiscal year:

Items.	Appropriated.	Expended.	Balance.
Subsistence	$20,000	$17,866.87	$2,133.13
Tobacco	300	300.00	.....
Forage and hay for bedding	2,500	1,856.39	643.61
Stationery	1,000	999.87	.13
Clothing and donations*	8,000	7,955.70	44.30
Medical supplies	1,500	1,499.93	.07
Advertising	200	38.40	161.60
Apprehension of escaped prisoners	780	660.00	120.00
Pay of employés and extra-duty men	16,800	14,282.85	2,517.15
Fuel and general supplies	20,000	19,999.63	.37
Buildings	4,000	4,000.00	.....
Transportation of discharged prisoners	5,000	2,567.76	2,432.24
Total	80,080	72,027.40	8,052.60

*Two hundred and sixty dollars of amount expended for donations was disbursed at Alcatraz Island, Cal., in payment of donations to prisoners released from confinement at that place.

In addition to the above $670 were expended in payment of donations to prisoners discharged at various posts.

Of the sum $72,027.40 expended during the year, $930 were for donations and $2,567.76 for transportation of prisoners released from confinement at the prison, which amount, being deducted, leaves as the expenditure of the prison proper $68,529.64, against $72,687.90 expended in the fiscal year 1892, $73,027.06 in the fiscal year 1891, $79,753.35 in the fiscal year 1890, and $79,818.92 in the fiscal year 1889.

Amount of appropriation (sundry civil bill)	$79,800.00
Appropriated in deficiency bill approved March 3, 1893	280.00
Total	80,080.00
Expenditures	72,027.40
Balance unexpended	8,052.60

Of this balance $2,432.24 is retained for the purpose of paying accounts not yet presented for payment for transportation of discharged prisoners.

Received from Treasury during the year		$74,930.00
Expended at prison	$71,767.40	
Turned into Treasury July 8, 1892	730.36	
Retained for transportation accounts	2,432.24	
		74,930.00

Number of donations sent to posts	134	
Donations paid by authorities at Alcatraz Island, Cal	52	
Donations to prisoners released at prison	281	
Total number of donations	467 at $5	=$2,335.00
Citizens' suits sent to posts during the year	235	

Receipts during year:
By sale of condemned prison property (hospital) turned into Treasury December 28, 1892 ..... 1.10

From labor of prisoners and sales of material the following amounts were received during the year, and the amount was covered into the Treasury on June 30, 1893:

By prisoners' labor	$1,373.60
Sale of rag carpet and mats	89.56
Sale of old barrels, cans, scrap iron, etc	127.41
Total	1,590.57

Property taken up on returns of property during the year:

Made by prison labor	bricks..	160,000
Cut on prison grounds:		
Soft wood	cords..	90
Oak lumber	feet..	7,000
Cottonwood lumber	do...	12,000

The products of the prison farm during the year were as follows:

Corn, 2,400 bushels; potatoes, 2,244 bushels; beans, 296 bushels; pease, 58 bushels; onions, 330 bushels; parsnips, 585 bushels; beets, 478 bushels; turnips, 230 bushels; radishes, 60 bushels; lettuce, 85 bushels; sweet potatoes, 475 bushels; carrots, 364 bushels; cucumbers, 370 bushels; tomatoes, 320 bushels; 1,800 melons, and about 65,000 cabbages.

This year the following acreage has been planted:

Seventy-five acres of corn, 50 of potatoes, 17 of beans, and about 20 of other vegetables, such as cabbage, onions, carrots, parsnips, beets, turnips, peas, etc.

The bottom lands on the prison farm have also been cleared during the year and 90 cords of soft wood, 7,000 feet of oak lumber and 12,000 feet of cottonwood lumber represent the result of such clearing.

The report of the prison quartermaster gives a detailed statement of all the work performed for the quartermaster's department in the various shops of the prison, and shows the price of each article manufactured. The boots and shoes turned out during the past year seem to have given general satisfaction, as very few complaints have been received.

Some embarassment was experienced on account of the suspension of work in the shoe shop during August, and much delay was caused in beginning the manufacture of the new calfskin shoes by a stoppage in the continuous teaching of new hands. The work is now progressing favorably and the prison will soon be able to turn out about 1,000 pairs per week, with a force of 114 prisoners.

Orders have been received to manufacture 30,000 pairs of these shoes during the fiscal year 1894.

It has been of decided benefit to the prison to have this amount of skilled labor to perform, admitting of the teaching of a trade to a large number of prisoners.

When labor in the shoe shop was suspended the inspector and two foremen were discharged, and only one foreman has since been employed, making a reduction of $100 per month in the manufacture of shoes.

Attention is invited to the accompanying reports of the prison surgeon, chaplain, executive officer, commissary officer, and guard commander.

The health of the prison has been good, despite the fact that a larger number of cases have been treated for various diseases due to temporary causes. Only one death occurred among the prisoners, and one in the guard (the latter a case of suicide). Credit is due the prison surgeon for careful attention to all patients.

The report of the executive officer shows that the discipline of the prisoners has been improved by the cellular system, though it has resulted in more attempts to escape. Thirteen escapes occurred and eleven recaptures. (One capture has been made since the end of the fiscal year.) This remarkable record of recaptures is due largely to the increase of the reward from $30 to $60.

I again invite attention to the recommendation that trial by summary courts be extended to prisoners, the reason for which has been given in former years.

The reports of both the executive officer and guard commander show that the discipline of the guard has been excellent.

The report of the prison commissary shows that the prisoners have been supplied with ample, good and well-cooked food.

While the change from dormitory to cellular system has proved beneficial, the unexpectedly large increase in the number of prisoners has prevented the keeping of all prisoners in cells, though the number of cells has been increased to 400, which were deemed ample at the time the change was instituted. The number of prisoners at the close of the last fiscal year was 390, while the number at the end of this fiscal year had reached 458, and at the present date there are 486 prisoners. So large an increase has compelled a recommendation that the sending of prisoners be suspended

until more cells can be constructed. A new floor of 44 cells will be begun as soon as material is procured and will be completed as soon as possible.

The report of the prison chaplain shows that the moral and educational instruction of prisoners have received more than ordinary care and attention with promise of the best results.

Two changes in the prison have been completed during the fiscal year which are of sufficient importance to merit particular mention, and which bring the military prison into line with modern progress in prison reform.

The first is the completion of four hundred cells making possible the separation of prisoners when not at work and thereby adding greatly to the discipline. Under the system of dormitories, there was no possibility of preventing the contamination of the good with the evil class of prisoners.

This will become much more important should the practice prevail of confining in this prison criminals convicted of civil offenses such as theft which have generally been sent to State penitentiaries.

Without such separation which is advocated by all reformers for all classes of prisons, this institution could not possibly be regarded as a true reformatory such as it was undoubtedly intended by the law that the military prison should be. Hereafter the reformatory idea can be carried out with every opportunity for success.

The second change consists in the institution of night schools, five nights in the week, and the increase of the number of scholars from 100 to 250.

Heretofore the school was composed of 100 scholars with two hours' recitation on Sunday. The former schoolroom admitted of no more than 100 scholars. On the occasion of the visit of the honorable, the Assistant Secretary of War, he expressed a desire that the school facilities should be increased. Accordingly a larger room was prepared and 125 double desks were purchased and placed in the new room. The new conditions took effect on the 26th of June and bid fair to be a complete success.

At the time of the institution of a school in the prison to be taught by prisoners under the superintendence of the prison chaplain it was considered a doubtful experiment but proved reasonably successful from the start and it seems certain that the night schools will prove even more successful.

It is believed that henceforth the Military Prison will offer educational advantages equal to those of most of the best prisons. With the increased facilities it is hoped that all prisoners, who are not mentally deficient, will be enabled to pass through the course of study required, when the term of confinement is not too limited.

Under the orders of the War Department, the commandant attended the Congress of the National Prison Association, at Chicago, rendered the report as chairman of the standing committee on prison discipline, was elected one of four vice-presidents, and was reëlected a director of the association.

The officers of the prison have executed their various and difficult duties with praiseworthy zeal, fidelity, and intelligence. Without such active and earnest coöperation it would be impossible to maintain the high standard of discipline which the Military Prison has reached as judged by the commendations of the authorities, and of such wardens as have occasionally visited the institution.

Very respectfully, your obedient servant,

J. W. POPE,
Captain and A. Q. M., U. S. Army, Commandant.

The ADJUTANT-GENERAL, U. S. ARMY,
Washington, D. C.

OFFICE OF THE ATTENDING SURGEON, U. S. MILITARY PRISON,
Fort Leavenworth, Kans., July 10, 1893.

SIR: I have the honor to submit the following report for the year ending June 30, 1893.

The following tabular statement shows the number admitted to the sick report during the year, with mean strength and disposition of cases.

The statement shows an increase both in the number of admissions and in the average daily percentage of sick to mean strength over that of former years. These increases were largely due to the outbreaks of mumps and epidemic influenza, and the retention on the sick report for a long period of a number of chronic cases.

Mean strength and disposition of cases.

	Mean strength.	Remaining on sick report June 30, 1893.	Admitted to the sick report.		Total admitted.	Returned to duty.	Discharged on surgeon's certificate of disability.	Transferred to the Government Asylum (insane).	Died.	Total disposed of.	Remaining on sick report June 30, 1893.	Average daily percentage of sick to mean strength.
			For disease.	For injury.								
Commissioned	8	.....	6	.....	6	6	.....	.....	.....	6	.....	2.26
Enlisted	109	2	58	11	69	67	1	1	*1	70	1	3.56
Military prisoners	407	7	347	59	406	396	1	.....	1	398	15	3.23

*Suicide.

Among the prisoners, diseases of the digestive organs, as has always been the case at this prison, have occurred more frequently than any other class of diseases, 20 per cent of the admissions having been of this class, of which 75 per cent were for diarrhea alone.

The next most frequent disease met with was abscess, which was accountable for nearly 10 per cent of the admissions. A large proportion of these cases were of the sheaths of the tendons of the fingers, among men who were put at work in the shoe shop, evidently the result of contusion on tissues unaccustomed to this kind of work.

Boils and carbuncles furnished 7 per cent of the admissions, as did also colds and catarrhal affections of the respiratory organs.

Mumps and follicular tonsilitis were each responsible for 6 per cent of the admissions, while epidemic influenza and rheumatism each account for 5 per cent.

Malarial diseases came next in frequency, a little over 4 per cent of the admissions being of this class.

Four cases of typhoid fever occurred among the prisoners, constituting a little less than 1 per cent of the admissions. Pneumonia occurred but once.

Wounds and injuries, the greater number of which were slight in character, constituted a little over 13 per cent of the admissions.

The remaining 16 per cent were for various other diseases.

One prisoner, who was suffering from pulmonary consumption, was discharged on surgeon's certificate of disability, and one prisoner died of acute peritonitis.

A far greater number than those admitted to the sick report, but whose illness did not incapacitate them from work, were under treatment during the year; the monthly average of such was 250.

Among the guard catarrhal diseases of the respiratory organs and affections of the digestive system were the most frequent causes for admission to the sick report, each class constituting 20 per cent.

Wounds and injuries were the next in frequency, 16 per cent of the admissions being due to these.

Alcoholism, and diseases and injuries resulting from alcohol, constituted 10 per cent of the admissions. But two cases of venereal diseases appeared on the sick report during the year.

Mumps and epidemic influenza affected the command to about the same extent as the prisoners, while malaria occurred but once.

One death (from suicide) took place, and one member of the provost guard was transferred to the Government Insane Asylum.

The detail of privates of the Hospital Corps as nurses in place of prisoners has resulted not only in the maintenance of better discipline in the hospital wards, but has also resulted in better service to the sick.

Hospital Stewards Cabell and McGloin have been faithful and diligent, and have performed all the numerous duties which have fallen to them in an intelligent and efficient manner.

As regards the hygiene of the prison, embracing the drainage and sewerage, the clothing and food, the sanitary condition of the buildings and quarters, and other conditions affecting the health of the command and prisoners, attention is respectfully invited to the sanitary report, with recommendations contained therein, submitted by me in compliance with G. O. No. 5, c. s., A. G. O.

The dormitories, buildings, grounds, and stables are maintained in a scrupulously cleanly condition by a rigid system of policing.

Very respectfully, your obedient servant,

CHAS. RICHARD,
Captain and Assistant Surgeon, U. S. Army, Attending Surgeon.

The PRISON ADJUTANT.

CHAPLAIN'S OFFICE, U. S. MILITARY PRISON,
Fort Leavenworth, Kans., June 30, 1893.

SIR: I have the honor to submit herewith my report for the fiscal year ending to-day.

Although much of my work has been of a character which precludes its tabulation upon paper, I present the required statistics and add a few statements concerning the four departments assigned to my care.

(*1*) *Chaplain's department.*—Sunday services have been conducted regularly with an attendance that has been gratifying, considering the fact that no compulsion has been used to secure it. The evidence of good results has not been wanting, although reliable statistics are more nearly impossible of procurement than in any other field of religious or moral endeavor. The sincerity of the prisoner's profession and the strength of his purpose can only be known when the period of his confinement is over and he faces those opportunities for wrongdoing which prison restraint had made impossible.

In temperance and religious work I have modified former methods so as to reduce to a minimum the cases of reformation in which opportunity is given for publicity. A more or less public profession is necessary for the hypocrite, else there is little inducement for him to act. It has been my aim to preach a gospel that demands an acknowledgment of wrongdoing and restitution therefor as the first step to reformation; to present worthy ideals and to emphasize the hopefulness which gave character to the ministry of the Master as He sought the salvation of erring men.

We are sure to hear of the bad men who go out from us, because their names besmirch the columns of those newspapers which pander to the public taste for filth. Many of the good men, at the time of discharge, shake the prison dust from their feet and sever so completely their relation to the place and all connected with it that they may never be reminded of their sojourn here. How many there may be of such, only the recording angel knows.

The chapel has been immensely beautified and improved, rendering it more suitable for a place of worship. The very character of the room now gives it an educational and uplifting influence, and the completion of present plans will leave nothing more to be desired.

On all legal holidays I have arranged some educational service or entertainment.

In December, I attended the Prison Congress at Baltimore, by order of the War Department, and can not speak too highly of the advantage afforded me for gaining information from the chaplains and wardens there assembled, in relation to the reformatory aspect of my work. If, as the War Department has announced in our prison regulations, the reformation of prisoners is the thing to be kept constantly in view, it seems to me that the Department owes it to the men confined here, that their chaplain, whose work is distinctively reformatory, should regularly be enabled to attend these convocations of specialists and make himself second to none in knowledge and ability along this line. The expense is small when compared to the advantage to be gained.

I have been unable to make regular hospital visitations or to do much personal work among prisoners, owing to a press of duties in other departments.

(*2*) *Library department.*—Mainly by purchase from the mess fund, and partly by private benefaction, 371 volumes have been added during the year, making the total number now on hand 3,757.

The small circulation noted in the accompanying table for the beginning of the fiscal year was due to the fact that the entire library was being reclassified and numbered, and only a limited number of books could be given out. The circulation, however, reached 1,258 for April, and 10,442 during the year. A study of the table will show what subjects have been preferred. Many of the books have been rebound, and the character of the work reflects credit upon the present binder. But the wear and tear of the library has been so great that the force employed in the bindery can not prevent an accumulation of unserviceable books. From 600 to 800 volumes at present need rebinding and are withheld from circulation.

I have sent out appeals by the thousand to editors and others for donations of papers and magazines, and although not more than 10 per cent have contributed, the responses received have been most generous and practical. Many of the leading

publishers of the country have offered half-rates for the benefit of the prisoners, and if, in the future, a moderate sum from the mess fund can be expended for magazines and papers that can not otherwise be secured, as well as for books, our tables can be supplied with standard publications whose perusal would be most beneficial.

(3) *Educational Department.*—The number of graduates, 22, is smaller than in former years, but the examination has been more rigid.

I have tabulated only the attendance under the former plan of Sunday sessions, and an enrollment limited to 100, but on June 26 the suggestion I had the honor to make to the Assistant Secretary of War during his inspection of this department, concerning enlargement, etc. (a recommendation made also in my last annual report), came into practical operation. Upon that date there was turned over for my use a larger room, splendidly lighted by day or by night, well ventilated, and perfect in all its appointments, in which were placed patent desks for 250 men. Night sessions were then instituted, from 7 to 8 o'clock each evening, except Saturday and Sunday. The advantage of the new plan is quite apparent, and the increased interest of the men in their studies is marked. I am now able to secure for teachers the best qualified men in the prison from among the clerks and others who frequently could not be spared on Sunday. I am also able to give to every man upon the night after his entry into the prison a thorough examination to determine his classification. That the interest in study can be better sustained by daily sessions than by the lapse of a week between school hours, scarcely needs to be mentioned.

It is hoped that the present rudimentary curriculum may soon give place to something more advanced. This does not, however, seem feasible at present, in view of the fact that of 236 men now in school, 126 are in the primary grades, and 41 in the intermediate, and that there are in the prison about 165 men who need to go to school, but for most of whom I am unable to furnish seats. Of the latter class, at present crowded out of school, 99 belong to the primary grades and 36 to the intermediate.

Beyond the changes already made in prison regulations, I beg to withhold my recommendations for a supplemental report, when I shall have been able to measure the time required for the completion of the course and to test certain plans before submitting them for approval.

(4) *Mail department.*—The careful reading of 12,599 letters, oftentimes between the lines for hidden meanings, and more frequently with the aid of glasses to render "crow-tracks" more intelligible, and with "guessing-cap," to determine what the various systems of orthography might be designed to mean; and the close inspection of 34,788 newspapers (47,387 pieces of mail, in all) to see that nothing immoral or improper, and no message or contraband article may be found in them, has been, perhaps, as important a task, viewed from the standpoint of discipline, as that performed by any official of the prison, and one that has consumed a vast amount of time, patience and vital force.

It has taken hours which might profitably have been devoted to the other departments of my work, and has, unfortunately, involved me in the work of discipline, with which a chaplain, if he would do his legitimate work among the prisoners, should have nothing to do. That it has seriously interferred with the freedom of my work as a clergyman, I have had frequent evidence. The work is so vitally related to the discipline of the prison, that I fully concur in the views of the present executive officer, with whom I have had to be in daily conference, that the inspection of mail logically belongs to his office.

I desire to record my gratitude to the officers and ladies of the prison and the post, as well as to the friends from Leavenworth, who have given me valuable coöperation. To the commandant I am particularly obligated for the moral and material support he has granted me, and for the very generous treatment which my official requests have uniformly received. I wish to emphasize this expression of gratitude personally and in the name of the men whom it is my privilege to serve.

Very respectfully, your obedient servant,

CHARLES C. PIERCE,
Post Chaplain, U. S. Army, Prison Chaplain.

The PRISON ADJUTANT.

ACTING ASSISTANT QUARTERMASTER'S OFFICE,
UNITED STATES MILITARY PRISON,
Fort Leavenworth, Kans., July 7, 1893.

SIR: I have the honor to submit the following report of the work of this office during the fiscal year ending June 30, 1893:

SHOE SHOP.

There were employed in this shop one inspector at $116.66 per month, and one

instructor at $100 per month, and prisoners varying in number from 25 to 110, amounting to 13,788½ days' labor at 50 cents per day. Total value of labor, $9,127.51.

There were manufactured during the year:

3 pairs officers' regulation boots, average cost per pair	$7.12
14,507½ pairs shoes, campaign, sewed, average cost per pair	1.79
13,760 pairs shoes, calfskin, hand sewed, average cost per pair	1.84

Operations in this shop were suspended during the month of August, 1892.

CARPENTER SHOP.

In this shop from 2 to 5 prisoners have been employed in the manufacture of stores for the quartermaster's department.

Total number of days, 731½, at 50 cents per day, $365.75.

The following articles were manufactured at the average cost set opposite each article:

174 mess tables	$5.00
1,594 mess stools	.33
14 company field desks	7.05

HARNESS SHOP.

There have been employed in this shop 1 foreman at $100 per month and from 4 to 12 prisoners, or 2,838 days' labor at 50 cents per day. Total value, $2,619.

There were manufactured during the year at the average cost set opposite each:

275 S. S. harness, ambulance, wheel	$15.79
273 S. S. harness, ambulance, lead	13.43
38 S. S. harness, wagon wheel	18.38
10 S. S. harness, wagon, lead	9.27
12 S. S. harness, ambulance, wheel, light	14.77
12 S. S. harness, express, wheel	26.39
128 S. S. harness, cart	15.26
12 pairs lines, 4-horse	2.02
33 pair lines, 2-horse	1.47
6 sets lines, cart	1.13
6 lines, jerk	1.63
48 bridles, ambulance	1.80
24 bridles, wagon	1.59
623 straps, halter	.27
412 straps, hames	.27
127 straps, breast	.43
4 straps, pole	1.71
6 straps, holdback	.15
2 straps, hip for cart harness	.85
2 straps, breeching	2.40
318 halters	.88
48 traces, ambulance	1.65
20 hame tugs	.79
1 shaft girth	.62
136 aparejos and pack saddles (repaired)	13.69

TIN SHOP.

There were employed in the tin shop 1 foreman at $100 per month and 2 to 8 prisoners, or 1,734 days' labor at 50 cents per day. Total value, $2,067.

The following articles were manufactured at the average cost set opposite each:

557 tin wash boilers, A. R	$1.30
128 tin coffee boilers, A. R	.74
541 tin teakettles, A. R	.59
24 tin steamers, A. R	.31
111 tin pot covers, A. R	.12
177 sheet-iron bakepans, A. R	.38
1,039 tin boilers, square	1.63
59 tin boilers, square, with faucets	2.26
116 tin boilers, round	1.46
30 tin boilers, wash	1.56
264 tin boilers, round, with faucets	1.91
114 tin boilers, coffee	.68

28 tin boilers, vegetable and rice	$0.84
59 tin steamers, square	.85
390 tin coffee pots	.38
24 tin stewpans	.25
78 tin dishpans	.58
40 tin saucepans	.44
32 tin teapots	.26
170 tin dippers	.39
702 sheet-iron bakepans, assorted	.38
11,700 joints sheet-iron stovepipe, common	.11
1,894 joints sheet-iron elbows, common	.14
30 joints sheet-iron T joints	.28
193 joints sheet-iron stovepipe, common, taper	.13
50 joints sheet-iron elbows, common, taper	.20
3 joints Russian iron stovepipe	.47
1 joint Russian iron stovepipe elbow	.34
919 stovepipe collars	.06
136 flue stoppers	.08
40 flue thimbles	.05
3 camp stoves, with furniture	12.47
6 drums, Russian iron	2.57

BROOM SHOP.

There were employed in the broom shop from 2 to 5 prisoners, or 1,120½ days, at 50 cents per day. Total value, $560.25.

The following articles were manufactured at the average cost set opposite each:

2,000 corn brooms	$0.16
71 rope mats	.85

BLACKSMITH SHOP.

There were employed in the blacksmith shop from 1 to 3 prisoners, or 155 days' labor, at 50 cents per day. Total value, $77.50.

Manufactured during the year:

100 sets legs and braces for mess tables.
5,500 iron rods for mess stools.

TAILOR SHOP.

There were employed in the tailor shop from 1 to 3 prisoners, or 435 days, at 50 cents per day. Total value, $217.50.

The following articles of clothing were manufactured for issue to prisoners in confinement at Alcatraz Island, California:

50 coats	$2.11
320 pairs trousers	1.67
45 shirts	1.30

The following labor was performed by prisoners for the post quartermaster, Fort Leavenworth, Kans., including labor on assembly hall:

6,952½ days' skilled labor, at 50 cents per day	$3,476.25
25,647 days' unskilled labor, at 35 cents per day	8,976.45
Total	12,452.70

TOTAL LABOR.

The total amount of skilled labor employed by the quartermaster's department was 27,755 days, at 50 cents per day	$13,877.50
The total amount of unskilled labor, consisting of that done by prisoners turned over to the post quartermaster, Fort Leavenworth, Kans., as laborers, was 25,647, at 35 cents per day	8,976.45
Total	22,853.95

RECEIPTS.

Sale of scrap leather, copper, and sacks for packing	$469.00
Sales to officers of fuel, forage, and mineral oil	767.64
Sales to officers of clothing and equipage	218.30
Sales to officers of miscellaneous clothing and equipage	10.50
Sales to officers of miscellaneous quartermaster's stores	23.10
Sales of condemned property, clothing, and equipage	1.30
Sales of condemned property, quartermaster's stores	4.50
Total	1,494.34

EXPENDITURES.

The disbursements of the quartermaster's department during the fiscal year were as follows:

Paid out of the appropriations for fiscal year 1892–'93:	
Regular supplies (tinware, etc.)	$6,383.86
Incidental expenses (clerical services, etc.)	1,985.25
Army transportation (harness, field desks, etc.)	6,062.28
Clothing and equipage (shoes, etc.)	10,316.16
Total	24,747.55
Paid out of appropriations for fiscal year 1891–'92:	
Regular supplies	4,542.12
Army transportation	767.68
Clothing and equipage	4,046.98
Barracks and quarters	2,124.06
Total	11,480.84
Total disbursements	36,228.39

There have been transported from this prison to general depots of the quartermaster's department and to various points 340,968 pounds of freight, for which 601 bills of lading were issued.

There have been 393 transportation requests issued, covering transportation of 276 prisoners returning to last place of enlistment and 267 escorts returning to their proper stations.

Very respectfully, your obedient servant,

GEORGE B. DAVIS,
First Lieutenant, Fifth Infantry, A. A. Q. M.

The ADJUTANT, U. S. MILITARY PRISON.

OFFICE OF EXECUTIVE OFFICER, U. S. MILITARY PRISON,
Fort Leavenworth, Kans., July 10, 1893.

SIR: I have the honor to submit the following report for the year ending June 30, 1893:

In my inspections I have found the police of the prison buildings and grounds to be excellent. The discipline of the prison has been good. As a result of the completion of sufficient cells to accommodate all except paroled prisoners it has been practicable to enforce the prison rules in regard to discipline more uniformly. That this has made confinement in the military prison more of a punishment is evidenced by the many attempts to escape during the past year on the part of long-time men and some of the hard cases. As soon as the privileges of the yard are limited to the first class it will be possible to prevent much of the plotting to escape, etc., that is now done while prisoners of all classes are allowed to get together in the yard.

During the year thirteen prisoners succeeded in making their escape—five from the prison proper and the remainder from outside, one of these being a paroled man. Of this number three made each two escapes. Nine of these men were recaptured; also two who had escaped in previous years. Several plots to escape have been detected and frustrated. The discipline of the provost guard is excellent. The men perform their duties, as a rule, in an excellent manner, and are well instructed; their arms are in good condition, and their clothing, general appearance, and behavior, both on and off duty, are excellent.

The number of trials by summary courts of members of the guard during the year was fifty; during the previous year it was fifty-seven.

The civilian foremen and other employés I have found to be prompt and attentive to their duties.

I would respectfully renew my recommendation of previous years, that the jurisdiction of the summrry court be extended to prisoners.

Very respectfully, your obedient servant,

B. H. GILMAN,
Captain, Thirteenth Infantry, Executive Officer.

The PRISON ADJUTANT.

OFFICE OF ACTING COMMISSARY OF SUBSISTENCE,
U. S. Military Prison, Fort Leavenworth, Kans., July 6, 1893.

SIR: I have the honor to submit the following report of this office, fiscal year ending June 30, 1893:

The number of rations issued during the year was as follows:

To prisoners	148,857
To civilian employés	1,925
Total number of rations	150,792
Daily average number of prisoners	407 $\frac{102}{365}$
Daily average number of civilian employés	7
Average cost for rations (daily) ..... cents	12
Total cost of rations	$17,866.87

The ration in bulk is as follows: Pork, 1,630 pounds; rice, 1,375 pounds; pease, 4,505 pounds; beef, 113,814 pounds; salt, 6,150 pounds; pepper, 242 pounds; soap, 2,410 pounds; vinegar, 987 gallons; flour, 200,615 pounds; beans, 3,975 pounds; coffee, 3,950 pounds; tea, 649 pounds; sugar, 13,985 pounds; candles, 20 pounds.

In addition, dried pease, hominy, barley, and potatoes purchased from the mess fund, and a variety of vegetables raised on the prison farm.

The food is well cooked, each prisoner having an abundance, and ample time is allowed for eating.

Last February a new rotary oven was placed in the kitchen at a cost of $768, and two new steam boilers have been contracted for, to be delivered this month, costing $135 each.

The mess outfit is in very good condition. The greater part of the ration was purchased from the subsistence department. Proposals were sent to various merchants inviting bids on tea, coffee, and sugar. Their prices on the different articles being cheaper than those of the subsistence department, they were accepted.

The number of pounds of tobacco issued to prisoners engaged on special or excessive hard labor during the year was 841¼ pounds, the value of which was $300.

I am assisted in my duties by Commissary Sergeant George Wentzel, whom I consider a most efficient and excellent noncommissioned officer, and it is due to his great care in making the issues that the wastage has been reduced to a minimum, thereby increasing the money value of the savings.

At the close of the fiscal year there was a balance on hand and in my possession of $2,342.97 belonging to the prison mess fund of which I am treasurer.

Very respectfully, your obedient servant,

R. M. BLATCHFORD,
First Lieutenant, Eleventh Infantry, Prison Commissary.

The PRISON ADJUTANT.

OFFICE OF COMMANDING OFFICER PROVOST GUARD,
U. S. Military Prison, Fort Leavenworth, Kans., July 10, 1893.

SIR: I have the honor to submit the following report on the provost guard, for the year ending June 30, 1893; the strength of the guard at my last report was 107 enlisted men. During the past year the following changes have taken place:

Gain.

Enlisted in guard	5
Reënlisted in guard	10
By transfer	11
Recruits from depots	2
Total	28

Loss.

Discharged expiration of term of service	17
Discharged for disability	2
Discharged by order	7
Discharged by sentence of court-martial	3
Transferred	3
Deserted*	2
Died	1
Retired	1
Total	36

Recruiting.—For the past year the guard has been recruited principally by voluntary transfer from the line, but on account of existing vacancies it became necessary a few days ago to request that ten men be assigned from recruiting depots, who have served one enlistment, character "Excellent."

Past experience has shown, however, that this method of recruiting the guard does not give as good results as by voluntary transfer of soldiers from the line, and I would recommend its use only as a last resort, for but very little can be learned from a soldier's discharge as to his qualifications for the duties required of him at this prison.

Discipline.—During the year I have visited the working parties daily, as required by prison regulations, and with a very few exceptions have found the members of the guard attentive to their duties and carefully guarding the prisoners under their charge. The discipline of the guard is excellent. The noncommissioned officers have shown themselves to be efficient, reliable, and painstaking in the performance of their duties.

Quarters.—The quarters are excellent, large, and well ventilated.

Amusement of guard.—The guards' amusement room is fitted up with a billiard and pool table, a stock of cigars and tobacco, and plenty of good reading matter, and is a great source of pleasure to them during recreation hours; the profits arising therefrom are used in improving the mess.

Messing of guard.—During the past year $2,182.61, arising from savings on the ration, profits from amusement room, and board from civilian employés, have been expended for the improvement of the mess, which, together with the vegetables received from the prison garden, has enabled the guard to have nearly everything that the market affords.

Company fund.—The amount of company fund is $412.55.

Arms.—The guard is armed with Colts revolvers and Spencer repeating shotguns. The Parker and English guns formerly in use have been replaced during the year by the Spencer repeating shotgun.

Very respectfully, your obedient servant,

FREDERICK PERKINS,
First Lieutenant, Eighth Infantry, Commanding Provost Guard.

The PRISON ADJUTANT.

UNITED STATES MILITARY PRISON,
Fort Leavenworth, Kans., July 25, 1893.

Number of prisoners in confinement on the 30th day of June, 1893, 458.

Of the number of prisoners confined there were sentenced from the different regiments as follows:

Cavalry: First, 21; Second, 6; Third, 16; Fourth, 2; Fifth, 11; Sixth, 19; Seventh, 20; Eighth, 15; Ninth, 5; Tenth, 5; making a total from the cavalry arm of 120.

Artillery: First, 15; Second, 15; Third, 11; Fourth, 19; Fifth, 3; making a total from the artillery arm of 63.

Infantry: First, 2; Second, 9; Third, 12; Fourth, 1; Fifth, 9; Sixth, 7; Seventh, 24; Eighth, 10; Ninth, 4; Tenth, 11; Eleventh, 2; Twelfth, 16; Thirteenth, 6; Fourteenth, 3; Fifteenth, 8; Sixteenth, 6; Seventeenth, 7; Eighteenth, 9; Nineteenth, 4; Twentieth, 8; Twenty-first, 11; Twenty-second, 15; Twenty-third, 5; Twenty-fourth, 4; Twenty-fifth, 12; making a total from the infantry arm of 205.

Battalion of Engineers, 3; Hospital Corps, U. S. A., 2; Provost Guard, G. S., U. S. A., 1; Ordnance Department, 4; general non-commissioned staff, 1; recruits, mounted service, 20; recruits, general service, 39; the whole making a grand total of 458.

*One deserted while en route to join guard, leaving strength of guard on June 30, 1893, 99 enlisted men.

Of the number of prisoners confined there were sent from the different departments as follows: War, 73; Atlantic, 6; Missouri, 96; Platte, 66; Dakota, 70; Texas, 39; East, 89; Columbia, 2; Arizona, 17; the whole making a total of 458.

The following represents the various charges upon which the prisoners were tried and sentenced: Desertion, 276; desertion and desertion, 10; desertion, desertion and seventeenth article of war, 1; desertion, desertion and fiftieth article of war, 1; desertion, desertion and sixtieth article of war, 1; desertion, desertion and sixty-second articles of war, 4; desertion, desertion, sixty-second and sixty-second articles of war, 1; desertion, desertion, seventeenth, sixtieth, and sixty-second articles of war, 1; desertion, desertion and desertion, 2; desertion, desertion, desertion, desertion and sixty-second article of war, 1; desertion and seventeenth article of war, 22; desertion and twentieth article of war, 1; desertion and thirty-second article of war, 1; desertion and fiftieth article of war, 1; desertion and fifty-first article of war, 1; desertion and sixtieth article of war, 5; desertion and sixty-second article of war, 26; desertion and theft, 3; desertion, seventeenth and fortieth articles of war, 1; desertion, seventeenth and sixtieth articles of war, 2; desertion, seventeenth and sixty-second articles of war, 7; desertion, seventeenth article of war and theft, 1; desertion, twentieth and sixty-second articles of war, 1; desertion, fifty-first and sixty-second articles of war, 1; desertion, sixtieth and sixty-second articles of war, 3; desertion, sixtieth article of war and theft, 1; desertion, sixty-second and sixty-second articles of war, 1; desertion, sixty-second article of war and theft, 2; desertion, sixteenth, seventeenth and sixtieth articles of war, 1; desertion, seventeenth, fortieth and forty-second articles of war, 1; desertion, twenty-first and sixty-second articles of war and theft, 1; desertion, seventeenth, thirty-second, thirty-third, and sixty-second articles of war, 1; desertion, seventeenth, sixty-second, sixty-second, and sixty-second articles of war, 1; violation sixtieth article of war, 5; violation sixty-second article of war, 40; violation seventeenth article of war and theft, 2; violation twentieth and sixty-second articles of war, 2; violation twenty-first and sixty-second articles of war, 8; violations twenty-fourth and sixty-second articles of war, 1; violation thirty-third and sixty-second articles of war, 1; violation thirty-ninth and fortieth articles of war, 1; violation sixty-second and sixty-second articles of war, 4; violation sixty-second article of war and theft, 1; violation seventeenth, thirty-second, and sixty-second articles of war, 2; violation seventeenth, thirty-third, and sixty-second articles of war, 1; violation seventeenth and sixty-second articles of war and theft, 1; violation thirty-second, thirty-third, and sixty-second articles of war, 1; violation fortieth, sixtieth and sixty-second articles of war, 1; violations sixty-second, sixty-second and sixty-second articles of war, 1; violation twenty-first, twenty-first and thirty-second articles of war and theft, 1; violation fifty-first, sixty-second, sixty-second and sixty-second articles of war, 1; theft, 1; the whole making the grand total of 458.

The following are the terms of sentences and number of prisoners undergoing confinement under each term: Six months, 4; seven months, 1; eight months, 1; one year, 86; one year and one month, 1; one year and three months, 1; one year and five months, 1; one year and six months, 88; one year and seven months, 1; one year and eleven months, 1; two years, 80; two years and three months, 1; two years and six months, 123; two years and nine months, 1; two years and ten months, 1; three years, 19; three years and six months, 19; four years, 7; four years and six months, 2; four years and nine months, 1; five years, 12; five years and six months, 1; six years and six months, 2; seven years, 2; seven years and six months, 1; eight years, 1; the whole making a grand total of 458.

The approximate ages of the prisoners confined in the prison are shown by the following: Between nineteen and twenty years, 27; between twenty and twenty-five years, 249; between twenty-five and thirty years, 140; between thirty and thirty-five years, 33; between thirty-five and forty years, 5; between forty and forty-five years, 3; between forty-five and fifty years, 1; total, 458.

Of the prisoners confined here the nativity as claimed by them is as follows: United States, 349; Ireland, 41; Germany, 26; England, 14; Canada, 13; Scotland, 5; Sweden, 3; Austria, 2; Norway, 1; Denmark, 1; Switzerland, 1; East Indies, 1; Jamaica, 1; total, 458.

The following occupations are represented: Actors, 2; bakers, 6; barbers, 21; bartenders, 1; belt-makers, 1; blacksmiths, 11; bookbinders, 1; bookkeepers, 5; brakeman, 3; brass-finishers, 1; brass molders, 1; bricklayers, 3; broom-makers, 4; brush molders, 1; butchers, 6; cabinet-makers, 1; candy-makers, 1; carpenters, 18; carpet-weavers, 1; carriage-makers, 1; chair-makers, 1; chemists, 1; clerks, 26; cigar-makers, 2; coachmen, 1; collar-makers, 1; cooks, 7; coopers, 3; cotton-weavers, 1; curriers, 1; drug clerks, 1; engineers, 3; farmers, 16; firemen, 22; furriers, 1; gardeners, 4; glass-blowers, 1; harness-makers, 4; hatters, 1; hostlers, 10; iron-molders, 1; laborers, 84; linemen, 1; lithographers, 1; machinists, 7; masons, 1; miners, 8; morocco-finishers, 1; molders, 8; musicians, 5; nail-workers, 1; nickel-platers, 1; painters, 36; paper-hangers, 1; pressmen, 1; printers, 4; plumbers, 4; puddlers, 2; railroad men, 1; rolling-mill men, 1; rubber-workers, 1; saddlers, 1; sailors, 11;

salesmen, 1; shoemakers, 19; soldiers, 1; spinners, 1; steam and gas fitters, 1; stenographers, 1; stonecutters, 2; tailors, 14; teamsters, 25; telegraph-operators, 2; tinsmiths, 2; upholsterers, 2; waiters, 4; weavers, 2; wire-drawers, 1; wood-turners, 1; wool-spinners, 1. Total, 458.

Annual report of alterations in prisoners and prison labor performed at the U. S. Military Prison, Fort Leavenworth, Kans., during the fiscal year ending June 30, 1893.

Date.	In prison.		Gain.			Loss.							
						Discharged.							
	Aggregate.	Aggregate last report.	By transfer.	From escape.	Aggregate.	Expiration sentence.	By order.	On surgeon's certificate.	Transferred to provost guard.	Died.	Escaped.	Aggregate.	Sentences mitigated.
July 31, 1892	377	381	17	.....	17	31	3	.....	1	....	....	35	....
August 31, 1892	369	377	15	.....	15	21	2	.....	.....	....	....	23	6
September 30, 1892	373	374	25	.....	25	19	1	1	.....	....	....	21	6
October 31, 1892	380	381	35	.....	35	24	4	.....	.....	....	2	28	3
November 30, 1892	384	377	31	1	32	24	2	.....	.....	....	....	28	3
December 31, 1892	393	389	32	.....	32	19	4	.....	.....	....	7	23	....
January 31, 1893	397	393	25	4	29	16	2	.....	.....	....	....	25	1
February 28, 1893	438	409	56	3	59	17	1	.....	.....	....	....	18	8
March 31, 1893	438	411	19	.....	19	16	3	.....	.....	....	....	19	2
April 30, 1893	462	398	50	.....	50	24	....	.....	.....	1	1	26	3
May 31, 1893	463	412	26	.....	26	25	....	.....	.....	....	....	25	5
June 30, 1893	458	395	19	3	22	24	....	.....	.....	....	3	27	6
Total	4,932	4,697	350	11	361	260	22	1	1	1	13	298	43

RECAPITULATION.

In prison June 30, 1892	39
Received since	36
Total	756

LOSS.

Discharged:		
Expiration of sentence	260	
By order	22	
On surgeon's certificate	1	
Transferred to provost guard	1	
Died	1	
Escaped	13	
Total		298
Remaining in prison June 30, 1893		458

Prison labor performed.

During—	Labor performed for Quartermaster's Department.								
	For depot and post quartermasters.		Manufacturing department.						
	Number of days skilled.	Number of days unskilled.	Number of days shoe shop.	Number of days harness shop.	Number of days tin shop.	Number of days broom shop.	Number of days carpenter shop.	Number of days tailor shop.	Number of days blacksmith shop.
July, 1892	586.5	2,550	401	411	153	139	53	63	.....
August, 1892	471	2,626	.....	421	207.5	151	70	97	20
September, 1892	407	2,209	326	305	135	110	46	35	.....
October, 1892	500.5	1,733	666	224	132.5	81	46.5	45	.....
November, 1892	491	2,293.5	672.5	202	98	139	47.5	.....	.....
December, 1892	540.5	2,379	807	194	116	109	62	30	.....
January, 1893	621	1,776	845	180	164	81	56	.....	.....
February, 1893	686	1,375.5	901.5	178	140	76	54.5	.....	75
March, 1893	721	1,900	1,765.5	190	161	87	82	50	60
April, 1893	623	1,636.5	2,356.5	197	143	66	31	.....	.....
May, 1893	646	2,604.5	2,701.5	172	130	41	63	65	.....
June, 1893	659	2,564	2,346	164	154	40.5	120	50	.....
Total	6,952.5	25,647	13,788.5	2,838	1,734	1,120.5	731.5	435	155

Prison labor performed—Continued.

During—	Total labor performed for Quartermaster's Department.		Labor performed for prison.		Total days' labor.		
	Number of days skilled.	of days unskilled.	Number of days skilled.	Number of days unskilled.	Number of days skilled.	Number of days unskilled.	Aggregate number of days' labor.
July, 1892	1,806.5	2,550	1,442.5	4,258	3,249	6,808	10,057
August, 1892	1,437.5	2,626	1,484.5	4,714	2,922	7,340	10,262
September, 1892	1,364	2,209	1,628	4,511	2,992	6,720	9,712
October, 1892	1,695.5	1,733	1,514.5	4,339	3,210	6,072	9,282
November, 1892	1,650	2,293.5	1,517.5	3,995	3,167.5	6,288.5	9,456
December, 1892	1,858.5	2,379	1,739.5	4,576.5	3,598	6,955.5	10,553.5
January, 1893	1,947	1,776	1,694	4,699	3,641	6,475	10,116
February, 1893	2,111	1,375.5	1,439.5	4,303	3,550.5	5,678.5	9,229
March, 1893	3,116.5	1,900	1,849	4,422	4,965.5	6,322	11,287.5
April, 1893	3,416.5	1,636.5	1,772	4,305	5,188.5	5,941.5	11,130
May, 1893	3,818.5	2,604.5	1,606	4,148	5,424.5	6,752.5	12,177
June, 1893	3,533.5	2,564	1,685	4,446.5	5,218.5	7,010.5	12,229
Total	27,755	25,647	19,372	52,717	47,127	78,364	125,491

Average number of prisoners employed daily throughout the year of 306 working days:

Mechanics	154.00
Laborers	256.09
Total	411.09

Average number of prisoners in confinement per month, 408½.

ROSTER OF THE UNITED STATES MILITARY PRISON.

OFFICERS.

(1) Capt. J. W. Pope, A. Q. M., U. S. Army, commandant; (2) Capt. C. Richard, assistant surgeon, U. S. Army, prison surgeon; (3) Chaplain C. C. Pierce, U. S. Army, prison chaplain; (4) Capt. B. H. Gilman, Thirteenth Infantry, Executive Officer; (5) First Lieut George H. Sands, Sixth Cavalry, prison adjutant; (6) First Lieut. R. M. Blatchford, Eleventh Infantry, prison commissary; (7) First Lieut. F. Perkins, Eighth Infantry, commanding provost guard; (8) First Lieut. G. B. Davis, Fourth Infantry, prison quartermaster.

ENLISTED MEN.

(1) Commissary Sergt. G. Wentzel, U. S. Navy; (2) Hospital Steward H. C. Cabell, U. S. Army; and 3 privates, Hospital Corps.

PROVOST GUARDS, GENERAL SERVICE, U. S. ARMY.

First Sergt. J. Yon. Sergt. P. Collins, Sergt. H. Bannon, Sergt. C. F. Miller, Sergt. E. Edwards, Sergt. W. C. Hill, Sergt. J. Harrington, Sergt. J. Carmichael, Corpl. W. E. Garnett, Corpl. J. M. Purcell, Corpl. O. A. R. Barany, Corpl. R. Shiels, Corpl. E. Hull, Corpl. H. Sullivan, Corpl. C. S. Saylor, Corpl. P. Connell, and 83 privates.

CIVILIAN EMPLOYÉS.

J. C. Ripley, chief clerk of the prison; J. M. Allen, chief clerk of the quartermaster's department; Geo. Cook, clerk, adjutant's office.

PRISON EMPLOYÉS.

J. H. Case, foreman, carpenter shop; N. Mayer, foreman, blacksmith shop; R. H. Kingsley, engineer; J. F. Carroll, foreman, stonemasons; A. P. Schlag, foreman, tailor shop; W. Kelley, T. Kelly, L. Young, L. D. Sanders, J. Crawley, teamsters; J. Buckley, J. Leonard, watchmen; W. McGlinn, gardener.

QUARTERMASTER EMPLOYÉS.

J. McGowan, inspector; L. M. Nute, foreman instructor in shoe shop; H. H. Bohen, foreman tinner; A. Schiefer, foreman harness-maker; W. Jackson, forage-master.

Respectfully submitted.

J. W. POPE,
Captain and A. Q. M., U. S. Army, Commandant.

B.—*Position and distribution of troops by Departments, taken from*

POSTS.	SITUATIONS.	COMMANDING OFFICER.	GARRISONS.		PRESENT.				
			Number of companies.	Regiments.	General officers.	Aides-de-camp.	Adjutant-General's Department.	Inspectors-General.	Bureau of Military Justice.
DEPARTMENT OF THE EAST.									
Headquarters	Governors Island, New York.	Maj. Gen. O. O. Howard	--	Department staff.	1	2	1	1	1
Fort Preble, Me	Portland	Capt. R. M. Rogers, 2d Art.	1	2d Art	--	--	--	--	--
Fort Warren, Mass	Boston Harbor	Maj. Wm. Sinclair, 2d Art.	2	2d Art	--	--	--	--	--
Fort Adams, R. I	Near Newport	Col. Richard Lodor, 2d Art.	4	2d and 4th Art.	--	--	--	--	--
Fort Trumbull, Conn.	New London	Capt. J. H. Calef, 2d Art.	1	2d Art	--	--	--	--	--
Fort Columbus, N. Y.	Governors Island	Maj. W. L. Haskin, 1st Art.	3	1st Art	--	--	--	--	--
Fort Hamilton, N. Y.	New York Harbor	Col. L. L. Langdon, 1st Art.	4	1st Art	--	--	--	--	--
Fort Niagara, N. Y.	Youngstown	Col. Horace Jewett, 21st Inf.	3	21st Inf	--	--	--	--	--
Fort Ontario, N. Y.	Oswego	Capt. A. H. Bowman, 9th Inf.	1	9th Inf	--	--	--	--	--
Fort Porter, N. Y.	Buffalo	Maj. J. W. Powell, 21st Inf.	2	21st Inf	--	--	--	--	--
Fort Schuyler, N. Y.	Throggs Neck	Capt. F. C. Grugan, 2d Art.	2	2d Art	--	--	--	--	--
Fort Wadsworth, N. Y.	New York Harbor	Lt. Col. A. C. Wildrick, 1st Art.	3	1st Art	--	--	--	--	--
Fort Wood, N. Y.	Bedloes Island	Capt. A. M. Wetherill, 6th Inf.	1	6th Inf	--	--	--	--	--
Madison Barracks, N. Y.	Sacketts Harbor	Col. C. G. Bartlett, 9th Inf.	6	9th Inf	--	--	--	--	--
Plattsburg Barracks, N. Y.	Plattsburg	Capt. M. C. Foote, 9th Inf.	1	9th Inf	--	--	--	--	--
Fort McHenry, Md.	Baltimore	Maj. G. P. Rodney, 4th Art.	3	4th Art	--	--	--	--	--
Washington Barracks, D. C.	Washington	Col. H. W. Closson, 4th Art.	5	3d and 4th Art.	--	--	--	--	--
Fort Monroe, Va.	----------	Lt. Col. R. T. Frank, 2d Art.	8	1st, 2d, 3d, 4th, and 5th Art.	--	--	--	--	--
Fort Myer, Va.	Near Washington	Lt. Col. G. V. Henry, 7th Cav.	4	1st, 7th, 8th, and 9th Cav.	--	--	--	--	--
St. Francis Barracks, Fla.	St. Augustine	Col. N. W. Osborne, 5th Inf.	2	5th Inf	--	--	--	--	--
Fort McPherson, Ga.	Atlanta	Col. L. L. Livingston, 3d Art.	8	3d Art and 9th Inf.	--	--	--	--	--
Jackson Barracks, La.	New Orleans	Lt. Col. W. R. Kellogg, 5th Inf.	2	5th Inf	--	--	--	--	--
Mount Vernon Barracks, Ala.	Mount Vernon	Maj. G. B. Russell, 5th Inf.	3	5th and 12th Inf.	--	--	--	--	--
Newport Barracks, Ky.	Newport	Maj. W. M. Wherry, 6th Inf.	1	6th Inf	--	--	--	--	--
Fort Thomas, Ky.	Near Newport	Col. M. A. Cochran, 6th Inf.	6	6th Inf	--	--	--	--	--
Key West Barracks, Fla.	----------	Capt. James O'Hara, 3d Art.	1	3d Art	--	--	--	--	--
Total, Department of the East			77		1	2	1	1	1
DEPARTMENT OF THE MISSOURI.									
Headquarters	Chicago, Ill	Maj. Gen. N. A. Miles		Department staff.	1	3	..	1	1
Fort Sheridan, Ill.	Highwood	Col. R. E. A. Crofton, 15th Inf.	11	7th Cav., 1st Art. and 15th Inf.	--	--	--	--	--

the latest returns on file in the Adjutant-General's Office, 1893.

PRESENT.																				ABSENT.						AGGREGATE.		
Quartermaster's Department.	Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Colonels.	Lieutenant-colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and regimental staff officers.	Captains.	Subalterns.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.
5	1	1	5	...	...	...	...	1	...	2	...	...	...	1	19	22	41	...	...	...	...	...	...	22	19	41
...	...	1	...	...	...	...	...	...	...	1	...	...	...	2	59	4	63	...	...	...	1	1	1	5	59	64
...	...	1	...	...	...	...	...	...	1	2	...	...	...	3	123	7	130	...	...	...	3	3	3	10	123	133
...	...	2	...	...	...	...	1	...	1	4	...	1	1	7	269	17	286	...	...	...	5	5	5	22	269	291
...	...	1	...	...	...	...	...	...	...	1	...	...	...	2	62	4	66	...	...	..	1	1	1	5	62	67
...	...	2	...	...	...	...	...	...	1	3	...	...	...	6	175	12	187	...	...	...	3	3	3	15	175	190
...	...	2	...	...	...	...	1	...	...	3	...	1	1	9	271	17	288	...	...	1	3	4	4	21	271	292
...	...	1	...	...	...	...	1	...	...	3	...	1	1	4	190	11	201	...	...	1	4	5	5	16	190	206
...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	61	3	64	...	...	...	1	1	1	4	61	65
...	...	1	...	...	...	...	...	...	1	2	...	...	...	3	114	7	121	...	...	...	1	1	1	8	114	122
...	...	1	...	...	...	...	...	...	1	2	...	...	...	3	123	7	130	...	...	...	3	3	3	10	123	133
...	...	1	...	...	...	...	...	1	1	2	...	...	...	6	179	11	190	1	....	1	3	5	5	16	179	195
...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	61	3	64	...	...	...	...	...	...	3	61	64
...	...	1	...	...	...	...	1	...	1	5	...	1	1	9	325	19	344	...	....	2	3	5	5	24	325	349
...	...	2	...	...	...	...	...	...	...	1	...	...	...	1	60	4	64	...	...	...	1	1	1	5	60	65
...	...	1	...	...	...	...	...	...	1	2	...	...	...	4	172	8	180	...	....	1	5	6	6	14	172	186
...	...	2	...	...	...	...	1	...	1	5	...	1	1	10	309	21	330	...	...	...	5	5	5	26	309	335
1	1	2	...	...	...	1	...	1	2	7	...	...	...	24	456	39	495	...	....	1	...	1	1	40	456	496
...	...	1	...	...	...	...	...	1	...	4	...	...	...	7	262	13	275	...	...	...	...	...	...	13	262	275
...	...	1	...	...	...	...	1	...	...	1	...	1	1	2	128	7	135	...	....	3	6	9	9	16	128	144
...	...	1	...	...	...	...	1	1	1	6	...	1	1	14	482	26	508	1	....	2	9	12	12	38	482	520
...	...	1	...	...	...	...	...	1	...	2	...	...	...	3	113	7	120	...	...	...	1	1	1	8	113	121
...	...	1	...	...	...	...	...	...	1	3	...	...	...	4	172	9	181	...	...	...	2	2	2	11	172	183
...	...	...	...	...	...	...	...	...	1	1	...	...	...	1	63	3	66	...	...	...	1	1	1	4	63	67
...	...	2	...	...	...	...	1	1	...	5	...	1	1	11	384	22	406	...	....	3	5	8	8	30	384	414
...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	56	3	59	...	...	...	1	1	1	4	56	63
6	2	30	5	...	...	1	8	7	14	70	...	8	8	141	4,688	306	4,994	2	....	15	67	84	84	390	4,688	5,078
2	1	2	4	1	...	...	...	...	1	3	...	...	...	....	19	20	39	...	...	...	...	...	...	20	19	39
1	...	3	...	...	...	1	1	1	2	13	...	1	1	21	608	45	653	...	...	...	2	2	2	47	608	655

B.—*Position and distribution of troops by Departments, taken from the*

POSTS.	SITUATIONS.	COMMANDING OFFICER.	GARRISONS.		PRESENT.				
			Number of companies.	Regiments.	General officers.	Aides-de-camp.	Adjutant-General's Department.	Inspectors-General.	Bureau of Military Justice.
DEPARTMENT OF THE MISSOURI—cont'd.									
Fort Brady, Mich....	Sault Ste. Marie	Lt. Col. C. A. Wikoff, 19th Inf.	3	19th Inf.....	..	..	..	..	..
Fort Mackinac, Mich.	Michilimackinac Island.	Maj. E. M. Coates, 19th Inf.	1	19th Inf.....	..	..	..	..	..
Fort Wayne, Mich...	Detroit	Col. Simon Snyder, 19th Inf.	4	19th Inf.....	..	..	..	..	..
Fort Leavenworth, Kans.	.....	Col. E. F. Townsend, 12th Inf.	12	2d, 6th, 8th and 10th Cav., 5th, 7th, 10th, 12th, 13th and 14th Inf.	..	..	..	..	..
Fort Riley, Kans....	Junction City	Col. J. W. Forsyth, 7th Cav.	10	3d and 7th Cav., 2d, 3d and 4th Art.	..	..	..	..	..
Fort Supply, Ind. T..	16 miles from Woodward.	Lt. Col. D. Parker, 13th Inf.	4	3d Cav. and 13th Inf.	..	..	..	..	..
Fort Reno, Okla. T...	Near Cheyenne Agency.	Lt. Col. G. A. Purington, 3d Cav.	5	3d Cav. and 13th Inf.	..	..	..	..	..
Fort Sill, Okla. T....	65 miles north of Henrietta, Tex.	Col. M. Bryant, 13th Inf..	5	3d and 7th Cav., 13th Inf.	..	..	..	..	..
Total, Department of the Missouri..	.....	.....	55	.....	1	3	..	1	1
DEPARTMENT OF TEXAS.									
Headquarters.....	San Antonio, Tex...	Brig. Gen. Frank Wheaton.	..	Department staff.	1	2	1	1	..
Fort Bliss, Tex	El Paso.....	Maj. J. Henton, 23d Inf..	2	23d Inf	..	..	..	..	..
Fort Brown, Tex	Brownsville	Maj. H. Wagner, 5th Cav.	2	5th Cav.....	..	..	..	..	..
Fort Clark, Tex	Brackettville	Maj. T. E. Rose, 18th Inf .	8	3d and 7th Cav. and 18th Inf.	..	..	..	..	..
Eagle Pass, Tex	.....	Capt. G. H. Paddock, 5th Cav.	1	5th Cav.....	..	..	..	..	..
Fort Hancock, Tex ..	Hancock.....	Capt. H. Jackson, 7th Cav.	1	7th Cav.....	..	..	..	..	..
Fort McIntosh, Tex .	Laredo.....	Col. J. F. Wade, 5th Cav..	3	5th Cav. and 18th Inf.	..	..	..	..	..
Fort Ringgold, Tex..	Rio Grande City....	Maj. A. S. B. Keyes, 3d Cav.	3	5th Cav. and 18th Inf	..	..	..	..	..
Fort Sam Houston, Tex.	San Antonio.....	Col. J. J. Coppinger, 23d Inf.	11	5th and 7th Cav., 3d Art., 5th and 23d Inf.	..	..	..	..	..
Total, Department of Texas.....	.....	.....	31	.....	1	2	1	1	..
DEPARTMENT OF CALIFORNIA.									
Headquarters.....	San Francisco, Cal..	Brig. Gen. T. H. Ruger...	..	Department staff.	1	1	1	1	1
Fort Bidwell, Cal....	Surprise Valley.....	Capt. G. H. G. Gale, 4th Cav.	1	4th Cav.....	..	..	..	..	..
Fort Mason, Cal	San Francisco	Capt. S. A. Day, 5th Art.	1	5th Art.....	..	..	..	..	..
Alcatraz Island, Cal.	San Francisco Harbor.	Lt. Col. F. L. Guenther, 5th Art.	2	5th Art.....	..	..	..	..	..
Angel Island, Cal ...	San Francisco Harbor.	Col. W. R. Shafter, 1st Inf.	5	1st Inf.....	..	..	..	..	..
Benicia Barracks, Cal.	Benicia	Lt. Col. J. S. Casey, 1st Inf.	3	1st Inf.....	..	..	..	..	..

latest returns on file in the Adjutant-General's Office, 1893—Continued.

PRESENT.																		ABSENT.						AGGREGATE.		
Quartermaster's Department.	Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Colonels.	Lieutenant-colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and regimental staff officers.	Captains.	Subalterns.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.
..	..	1	..	..	..	..	..	1	...	2	...	...	...	4	173	8	181	...	....	1	2	3	3	11	173	184
...	..	1	..	..	..	..	..	..	1	1	...	...	...	2	60	5	65	...	....	...	...	...	...	5	60	65
...	..	1	..	..	..	..	1	..	...	3	...	1	1	5	247	12	259	...	....	3	7	10	10	22	247	269
1	..	3	..	..	..	..	1	1	2	12	...	1	1	54	670	76	746	1	....	1	7	9	9	85	670	755
1	..	3	..	..	..	..	1	1	2	10	...	1	1	23	698	43	741	...	....	1	2	3	3	46	698	744
...	..	2	..	..	..	1	..	1	...	3	...	...	...	5	228	12	240	...	....	1	3	4	4	16	228	244
...	..	2	..	..	..	..	..	1	...	4	...	1	1	5	316	14	330	...	1	2	7	10	10	24	316	340
...	..	2	..	..	..	1	1	..	1	3	...	1	1	7	309	17	326	...	1	4	7	12	12	29	309	338
5	1	20	4	1	..	3	5	6	9	54	...	6	6	126	3,328	252	3,580	1	2	13	37	53	53	305	3,328	3,633
3	1	1	3	..	1	..	..	..	..	..	..	..	..	3	18	17	35	...	....	...	...	...	...	17	18	35
...	..	1	..	..	..	..	..	..	1	1	...	...	...	3	111	6	117	...	....	1	1	2	2	8	111	119
...	..	1	..	..	..	..	..	..	1	2	...	...	...	2	113	6	119	...	....	...	2	2	2	8	113	121
...	..	3	..	..	..	..	..	..	1	7	...	1	1	10	430	23	453	1	1	3	10	15	15	38	430	468
...	..	1	..	..	..	..	..	..	..	1	...	...	...	1	57	3	60	...	....	...	1	1	1	4	57	61
...	..	1	..	..	..	..	..	..	..	1	...	...	...	1	59	3	62	...	....	...	1	1	1	4	59	63
...	..	1	..	..	..	1	1	..	..	3	...	1	1	4	202	12	214	...	....	2	6	8	8	20	202	222
...	..	1	..	..	..	..	..	..	1	3	...	...	...	4	208	9	217	...	....	...	2	2	2	11	208	219
...	..	3	..	..	..	..	1	1	...	8	...	1	1	21	640	36	676	...	1	5	5	11	11	47	640	687
3	1	13	3	..	1	1	2	1	4	26	...	3	3	49	1,838	115	1,953	1	2	11	28	42	42	157	1,838	1,995
1	1	1	..	..	..	..	..	1	1	...	...	...	...	1	16	11	27	...	....	...	...	...	...	11	16	27
...	..	...	..	..	..	..	..	..	..	1	...	...	...	1	57	2	59	...	....	...	1	1	1	3	57	60
...	..	1	..	..	..	..	..	..	..	1	...	...	...	2	55	4	59	...	....	...	1	1	1	5	55	60
...	..	1	..	..	..	1	..	1	...	2	...	...	...	2	112	7	119	...	....	...	4	4	4	11	112	123
...	..	1	..	..	..	1	1	..	...	1	...	1	1	8	298	14	312	...	1	6	2	9	9	23	298	321
...	..	1	..	..	..	..	..	1	...	2	...	...	...	3	164	7	171	...	....	1	3	4	4	11	164	175

B.—*Position and distribution of troops by Departments, taken from the*

POSTS.	SITUATIONS.	COMMANDING OFFICER.	GARRISONS.		PRESENT.				
			Number of companies.	Regiments.	General officers.	Aides-de-camp.	Adjutant-General's Department.	Inspectors-General.	Bureau of Military Justice.
DEPARTMENT OF CALIFORNIA—cont'd.									
Presidio, Cal	San Francisco	Col. W. M. Graham, 5th Art.	9	4th Cav. and 5th Art.	..	..	..	..	..
San Diego Barracks, Cal.	San Diego	Lt. Col. E. R. Kellogg, 10th Inf.	1	10th Inf	..	..	..	..	..
Total, Department of California			22		1	1	1	1	1
DEPARTMENT OF DAKOTA.									
Headquarters	St. Paul, Minn	Brig. Gen. Wesley Merritt.	..	Department staff.	1	1	1	..	..
Fort Snelling, Minn	Near St. Paul	Col. E. C. Mason, 3d Inf.	9	3d Inf	..	..	..	..	..
Fort Buford, N. Dak		Maj. T. J. Wint, 10th Cav.	5	10th Cav. and 25th Inf.	..	..	..	..	..
Fort Pembina, N. Dak		Capt. C. W. Miner, 22d Inf.	1	22d Inf	..	..	..	..	..
Fort Yates, N. Dak	60 miles from Bismarck.	Lt. Col. Richard Comba, 12th Inf.	7	8th Cav. and 12th Inf.	..	..	..	..	..
Fort Meade, S. Dak	Near Sturgis	Col. C. H. Carlton, 8th Cav.	7	3d and 8th Cav.	..	..	..	..	..
Fort Sully, S. Dak	25 miles from Pierre	Maj. J. H. Gageby, 12th Inf.	3	12th Inf	..	..	..	..	..
Fort Yellowstone, Wyo.	Yellowstone Park	Capt. G. S. Anderson, 6th Cav.	2	6th Cav	..	..	..	..	..
Fort Assinniboine, Mont.		Col. E. S. Otis, 20th Inf.	9	10th Cav. and 20th Inf.	..	..	..	..	..
Fort Custer, Mont	31 miles from Custer Station.	Lt. Col. David Perry, 10th Cav.	7	1st and 10th Cav. and 25th Inf.	..	..	..	..	..
Fort Keogh, Mont	Near Miles City	Col. P. T. Swaine, 22d Inf.	9	8th and 10th Cav. and 22d Inf.	..	..	..	..	..
Fort Missoula, Mont.	Missoula	Col. A. S. Burt, 25th Inf.	3	25th Inf	..	..	..	..	..
Camp Poplar River, Mont.	Poplar River Station	Maj. Loyd Wheaton, 20th Inf.	2	20th Inf	..	..	..	..	..
Total, Department of Dakota			64		1	1	1	..	..
DEPARTMENT OF THE PLATTE.									
Headquarters	Omaha, Nebr	Brig. Gen. John R. Brooke.	..	Department staff.	1	2	1	..	..
Fort Omaha, Nebr	Near Omaha	Col. J. C. Bates, 2d Inf.	9	2d Inf	..	..	..	..	..
Fort Niobrara, Nebr	Near Valentine	Col. D. S. Gordon, 6th Cav.	8	6th Cav. and 8th Inf.	..	..	..	..	..
Fort Robinson, Nebr		Col. James Biddle, 9th Cav.	8	9th Cav. and 8th Inf.	..	..	..	..	..
Fort Sidney, Nebr	Sidney Station	Lieut. Col. W. J. Lyster, 21st Inf.	4	21st Inf	..	..	..	..	..
Fort D. A. Russell, Wyo.	Cheyenne	Col. J. S. Poland, 17th Inf.	8	17th Inf	..	..	..	..	..
Fort McKinney, Wyo.	On Clear Fork Creek.	Col. J. J. Van Horn, 8th Inf.	5	6th and 9th Cav. and 8th Inf	..	..	..	..	..
Fort Washakie, Wyo.	Near Shoshone Agency.	Maj. Adam Kramer, 6th Cav.	3	6th Cav. and 8th Inf.	..	..	..	..	..
Camp Pilot Butte, Wyo.	Rock Springs	Capt. Wm. Quinton, 7th Inf.	1	7th Inf	..	..	..	..	..
Total, Department of the Platte			46		1	2	1	..	..

latest returns on file in the Adjutant-General's Office, 1893—Continued.

PRESENT.																	ABSENT.						AGGREGATE.		
Quartermaster's Department.	Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Colonels.	Lieutenant-colonels.	Majors.	Captains.	Regimental chaplain.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and regimental staff officers.	Captains.	Subalterns.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.
...	...	2	..	...	...	...	1	..	1	8	...	1	1	17	540	31	571	...	....	1	7	8	8	39	540	579
...	...	1	..	...	...	...	...	1	...	1	...	...	...	1	57	4	61	...	....	...	1	1	1	5	57	62
1	1	8	..	...	..	2	2	4	2	16	...	2	2	35	1,299	80	1,379	...	1	8	19	28	28	108	1,299	1,407
3	1	2	3	...	...	...	...	1	1	..	...	...	...	2	17	16	33	...	....	...	...	...	...	16	17	33
...	...	2	..	...	...	1	1	..	...	5	...	1	1	15	497	26	523	...	....	5	5	10	10	36	497	533
...	...	1	..	...	...	1	...	..	1	3	..	...	...	5	297	11	308	...	....	2	5	7	7	18	297	315
...	...	...	..	...	...	...	...	...	...	1	...	...	...	1	58	2	60	...	....	...	1	1	1	3	58	61
...	...	2	..	...	...	1	..	1	1	4	...	...	...	6	314	15	329	...	....	3	8	11	11	26	314	340
...	...	2	..	...	...	1	1	1	1	5	...	1	1	11	373	24	397	...	....	3	3	6	6	30	373	403
...	...	1	..	...	...	1	...	..	1	2	...	...	...	3	169	8	177	...	....	1	2	3	3	11	169	180
...	...	1	..	...	...	...	...	...	...	2	...	...	...	4	124	7	131	...	....	...	...	...	...	7	124	131
...	...	2	..	...	...	1	1	1	...	4	...	1	1	14	537	25	562	...	....	6	6	12	12	37	537	574
...	...	2	..	...	...	...	...	1	1	6	...	1	1	13	410	25	435	...	1	3	5	9	9	34	410	444
...	...	2	..	...	...	1	1	1	1	8	...	1	1	14	528	30	558	...	....	3	8	11	11	41	528	569
...	...	1	..	...	...	...	1	1	1	3	1	1	1	5	200	15	215	...	....	2	5	7	7	22	200	222
...	...	1	..	...	...	...	...	...	1	1	...	...	...	1	100	4	104	...	....	1	3	4	4	8	100	108
3	1	19	3	...	...	7	5	7	9	44	1	6	6	94	3,624	208	3,832	...	1	29	51	81	81	289	3,624	3,913
3	1	2	2	..	1	...	..	1	1	1	...	...	...	1	18	17	35	...	....	...	...	...	...	17	18	35
...	...	...	..	...	...	...	1	..	1	7	...	1	1	11	524	22	546	...	1	3	9	13	13	35	524	559
...	...	2	..	...	...	1	1	1	...	7	...	1	1	11	457	25	482	...	1	2	7	10	10	35	457	492
...	...	2	..	...	...	...	1	1	...	9	1	1	1	12	520	28	548	...	2	...	6	8	8	36	520	556
...	...	1	..	...	...	...	..	1	...	3	...	...	...	5	208	10	218	...	....	1	1	2	2	12	208	220
...	...	3	..	...	...	...	1	1	1	9	...	1	1	14	472	31	503	...	....	1	6	7	7	38	472	510
...	...	2	..	...	...	...	1	..	1	5	...	1	1	8	306	19	325	...	....	1	4	5	5	24	306	330
...	...	1	..	...	...	...	...	...	1	1	...	...	...	2	169	5	174	...	....	2	4	6	6	11	169	180
...	...	...	..	...	...	...	...	...	...	1	...	...	...	1	53	2	55	...	....	...	1	1	1	3	53	56
3	1	13	2	..	1	1	5	5	5	43	1	5	5	65	2,727	159	2,886	...	4	10	38	52	52	211	2,727	2,938

B.—*Position and distribution of troops by Departments, taken from the*

POSTS.	SITUATIONS.	COMMANDING OFFICER.	GARRISONS.		PRESENT.				
			Number of companies.	Regiments.	General officers.	Aides-de-camp.	Adjutant-General's Department.	Inspectors-General.	Bureau of Military Justice.
DEPARTMENT OF THE COLORADO.									
Headquarters	Denver, Colo	Brig. Gen. A. McD. McCook.	..	Department staff.	1	1	..	..	..
Fort Apache, Ariz	90 miles from Holbrook.	Maj. Henry Carroll, 1st Cav.	4	1st Cav. and 11th Inf.	..	..	..	..	..
Fort Bowie, Ariz	Bowie Station	Maj. Thos. McGregor, 2d Cav.	2	2d Cav	..	..	..	..	..
Fort Grant, Ariz	27 miles from Wilcox	Col. A. K. Arnold, 1st Cav.	5	1st Cav	..	..	..	..	..
Fort Huachuca, Ariz	Huachuca Station	Capt. F. M. Crandal, 24th Inf.	6	2d Cav. and 24th Inf.	..	..	..	..	..
San Carlos, Ariz		Capt. A. L. Myer, 11th Inf.	3	1st Cav. and 11th Inf.	..	..	..	..	..
Whipple Barracks, Ariz.	Prescott	Col. I. D. DeRussy, 11th Inf.	4	11th Inf	..	..	..	..	..
Fort Bayard, N. Mex	Near Silver City	Col. Z. R. Bliss, 24th Inf.	6	1st Cav. and 24th Inf.	..	..	..	..	..
Fort Marcy, N. Mex	Santa Fe	Col. E. P. Pearson, 10th Inf.	2	10th Inf	..	..	..	..	..
Fort Stanton, N. Mex	9 miles from Lincoln	Maj. A. H. Bainbridge, 10th Inf.	2	10th Inf	..	..	..	..	..
Fort Wingate, N. Mex.	Wingate Station	Col. G. G. Huntt, 2d Cav.	7	2d Cav. and 10th Inf.	..	..	..	..	..
Fort Logan, Colo	Near Denver	Col. H. C. Merriam, 7th Inf.	6	7th Inf	..	..	..	..	..
Fort Douglas, Utah	Near Salt Lake City	Col. M. M. Blunt, 16th Inf.	9	16th Inf	..	..	..	..	..
Fort Du Chesne, Utah	Near Uintah Agency	Maj. J. F. Randlett, 9th Cav.	2	9th Cav	..	..	..	..	..
Total, Department of the Colorado			58		1	1	..	..	..
DEPARTMENT OF THE COLUMBIA.									
Headquarters	Vancouver Barracks, Wash.	Brig. Gen. W. P. Carlin	..	Department staff.	1	2	1	..	..
Fort Sherman, Idaho	Cœur d' Alene	Lieut. Col. H. C. Cook, 4th Inf.	5	4th Cav. and 4th Inf.	..	..	..	..	..
Boise Barracks, Idaho.	Boise City	Maj. Michael Cooney, 4th Cav.	2	4th Cav. and 4th Inf.	..	..	..	..	..
Fort Canby, Wash	Mouth of Columbia River.	Capt. J. R. Brincklé, 5th Art.	2	5th Art	..	..	..	..	..
Fort Spokane, Wash	Near Spokane Falls	Capt. G. O. Webster, 4th Inf.	3	4th Inf	..	..	..	..	..
Fort Townsend, Wash.	Port Townsend	Capt. John Murphy, 14th Inf.	1	14th Inf	..	..	..	..	..
Vancouver Barracks, Wash.	Vancouver	Col. T. M. Anderson, 14th Inf.	7	4th Cav. and 14th Inf.	..	..	..	..	..
Fort Walla walla, Wash.	Wallawalla	Col. C. E. Compton, 4th Cav.	3	4th Cav	..	..	..	..	..
Total, Department of the Columbia			23		1	2	1	..	..

latest returns on file in the Adjutant-General's Office, 1893—Continued.

PRESENT.																		ABSENT						AGGREGATE.		
Quartermaster's Department.	Subsistance Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Colonels.	Lieutenant-colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and regimental staff officers.	Captains.	Subalterns.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.
3	2	1	2	...	...	...	...	...	1	1	...	...	...	2	16	14	30	...	...	...	...	...	...	14	16	30
...	...	1	...	...	...	1	...	...	1	2	...	...	...	2	212	7	219	...	...	2	6	8	8	15	212	227
...	...	1	...	...	...	...	...	...	1	2	...	...	...	2	112	6	118	1	...	...	2	3	3	9	112	121
...	...	2	...	...	...	...	1	...	...	3	...	1	1	8	299	16	315	...	...	3	4	7	7	23	299	322
...	...	1	...	...	...	...	...	...	...	4	...	...	...	8	334	13	347	1	...	2	4	7	7	20	334	354
...	...	1	...	...	...	...	...	...	...	2	...	...	...	2	198	5	203	1	...	1	4	6	6	11	198	209
...	...	2	...	...	...	...	1	...	1	3	...	1	1	6	241	15	256	...	...	3	4	7	7	22	241	263
...	...	2	...	...	...	...	1	...	...	5	...	1	1	11	369	21	390	...	2	3	5	10	10	31	369	400
...	...	1	...	...	...	...	1	...	...	2	...	1	1	4	136	10	146	...	...	2	4	6	6	16	136	152
...	...	1	...	...	...	...	...	...	1	1	...	...	...	4	116	7	123	1	...	1	...	2	2	9	116	125
...	...	2	...	...	...	...	1	1	1	5	...	1	1	9	421	21	442	2	1	...	7	10	10	31	421	452
...	...	2	...	...	...	1	1	...	1	4	...	1	1	11	363	22	385	...	...	4	5	9	9	31	363	394
...	...	2	...	...	...	...	1	1	...	7	...	1	1	14	523	27	550	...	1	3	6	10	10	37	523	560
...	...	1	...	...	...	1	...	...	1	2	...	...	...	4	123	9	132	...	...	...	...	...	...	9	123	132
3	2	20	2	...	...	3	7	2	8	43	...	7	7	87	3,463	193	3,656	6	4	24	51	85	85	278	3,463	3,741
3	1	1	3	...	...	...	...	1	1	2	...	...	...	1	15	17	32	...	...	...	...	...	...	17	15	32
...	...	2	...	...	...	...	...	1	...	4	...	1	1	8	295	17	312	...	2	2	...	4	4	21	295	316
...	...	1	...	...	...	...	...	...	1	2	...	...	...	2	105	6	111	...	...	2	...	2	2	8	105	113
...	...	1	...	...	...	...	...	...	...	2	...	...	...	2	110	5	115	...	...	...	4	4	4	9	110	119
...	...	1	...	...	...	...	...	...	...	2	...	...	...	5	163	8	171	...	...	2	3	5	5	13	163	176
...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	59	3	62	...	...	1	3	4	4	7	59	66
...	...	2	...	...	...	...	1	1	1	5	...	1	1	10	422	22	444	...	...	3	6	9	9	31	422	453
...	...	1	...	...	...	1	1	...	1	3	...	1	1	3	180	12	192	...	1	2	7	10	10	22	180	202
3	1	10	3	...	...	1	2	3	4	21	...	3	3	32	1,349	90	1,439	...	3	12	23	38	38	128	1,349	1,477

C.—*Military commands and posts, with post-offices, telegraph stations, and nearest railroad stations or boat landings.*

ARMY OF THE UNITED STATES.—Headquarters, Washington, D. C.—Maj. Gen. JOHN M. SCHOFIELD, commanding.

DEPARTMENT OF THE EAST.

Maj. Gen. OLIVER O. HOWARD, commanding.—Headquarters Governors Island, New York Harbor.

Geographical limits.—The New England States, States of New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Louisiana, Mississippi, Alabama, Kentucky, Tennessee, Ohio, and the District of Columbia.

DEPARTMENT OF THE MISSOURI.

Maj. Gen. NELSON A. MILES, commanding.—Headquarters, Chicago, Ill.

Geographical limits.—States of Michigan, Wisconsin, Indiana, Illinois, Missouri, Kansas, Arkansas, Indian and Oklahoma Territories.

DEPARTMENT OF TEXAS.

Brig. Gen. FRANK WHEATON, commanding.—Headquarters, San Antonio, Tex.

Geographical limits.—State of Texas.

DEPARTMENT OF CALIFORNIA.

Brig. Gen. THOMAS H. RUGER, commanding.—Headquarters San Francisco, Cal.

Geographical limits.—States of California and Nevada.

DEPARTMENT OF DAKOTA.

Brig. Gen. WESLEY MERRITT, commanding.—Headquarters St. Paul, Minn.

Geographical limits.—States of Minnesota, South Dakota (excepting so much as lies south of the forty-fourth parallel), North Dakota, and Montana, and the post of Fort Yellowstone, Wyo.

DEPARTMENT OF THE PLATTE.

Brig. Gen. JOHN. R. BROOKE, commanding.—Headquarters Omaha, Nebr.

Geographical limits.—States of Iowa, Nebraska, and Wyoming (excepting the post of Fort Yellowstone, Wyo.); so much of Idaho as lies east of a line formed by the extension of the western boundary of Utah to the northeastern boundary of Idaho, and so much of South Dakota as lies south of the forty-fourth parallel.

DEPARTMENT OF THE COLORADO.

Brig. Gen. ALEXANDER MCD. MCCOOK, commanding.—Headquarters Denver, Colo.

Geographical limits.—State of Colorado and the Territories of Utah, Arizona, and New Mexico.

DEPARTMENT OF THE COLUMBIA.

Brig. Gen. WILLIAM P. CARLIN, commanding.—Headquarters Vancouver Barracks, Wash.

Geographical limits.—States of Oregon, Washington, and Idaho, and Alaska Territory, excepting so much of Idaho as is embraced in the Department of the Platte.

POSTS.

[Those not garrisoned are indicated thus.*]

Adams, Fort, R. I.—(Dept. East).—P. O., R. R. and tel. stn. Newport, R. I.; boat from Newport, dist. 3 m.

Alcatraz Island, Cal. (Dept. Cal.).—P. O. same; tel. and R. R. stn. San Francisco, Cal., dist. 4 m.; Govt. steamer daily (except Sunday) to post.

Angel Island, Cal. (Dept. Cal.).—P. O. and tel. stn. same; R. R. stn. San Francisco, Cal., dist. 7 m.; Govt. steamer daily (except Sunday) to post.

Apache, Fort, Ariz. (Dept. Colo.).—P. O. and tel. stn. same; buckboard daily (except Sunday) from Holbrook, on A. and P. R. R., dist. 90 m.

Army and Navy General Hospital, Ark.—P. O., tel. and R. R. stn. Hot Springs, Ark.

Assinniboine, Fort, Mont. (Dept. Dak.).—P. O. and tel. stn. same; R. R. (G. N. R.) stn. Assinniboine.

Barrancas, Fort, Fla. (Dept. East).—P. O. Warrington, Fla.; tel. stn. Pensacola navy-yard, Fla.; R. R. stn. at Pensacola, Fla., dist. 9 m.; special boat to post.

Bayard, Fort, N. M. (Dept. Colo.).—P. O. and tel. stn. same; R. R. stn. (A. T. and S. F.) Silver City, dist. 9 m.

Benicia Barracks, Cal. (Dept. Cal.).—P. O., tel. stn. R. R. stn and boat landing Benicia, Cal., dist. 1 m.

Bidwell, Fort, Cal. (Dept. Cal.)—P. O. same; tel. stn. Reno, Nev.; R. R. stn. (N. C. and O. R. R.) Amedee, Cal., dist. 135 m.; stage daily, except Sunday.

Bliss, Fort, Texas. (Dept. Tex.).—P. O., tel. and R. R. stn. El Paso, Tex., dist. 5 m.

Boise Barracks, Idaho. (Dept. Columbia).—P. O., tel. and R. R. stn. Boise City, Idaho.

Bowie, Fort, Ariz. (Dept. Colo.).—P. O. and tel. stn. same; daily buckboard (except Sunday) from Bowie stn., Ariz., on S. P. R. R., dist 13 m.

Brady, Fort, Mich. (Dept. Mo.).—P. O., tel. and R. R. stn. (D. S. S. and A. R. R.) Sault Ste. Marie, Mich.

Brown, Fort, Tex. (Dept. Tex.).—P. O., tel. and R. R. stn. (R. G. R. R.) Brownsville, Tex.

Buford, Fort, N. Dak. (Dept. Dak.).—P. O., tel. and R. R. (G. N. R. R.) stn. same.

Canby, Fort, Wash. (Dept. Columbia).—P. O. and tel. stn. at post; daily steamer from Portland, Oregon, to Astoria, dist. 98 m., and thence by steam tug daily (except Sunday) to post, dist. 14 m.

**Carroll, Fort, Md.*—P. O. and tel. stn. Baltimore, Md., dist. 6½ m. by water from Light st. wharf.

**Caswell Fort, N. C.*—P. O. and tel. stn. Southport, N. C., dist. 2 m.; steamer daily from Wilmington to Southport, dist. 22 m.

Clark, Fort, Tex. (Dept. Tex.).—P. O. Brackettville, Tex.; tel. stn. Fort Clark, via Spofford Junction, Tex.; daily stage from Spofford Junction, on S. P. R. R., dist. 9 m.

**Clark's Point, Mass., Fort at.*—P. O. and tel. stn. New Bedford, Mass., dist. 4 m.

**Clinch, Fort, Fla.*—P. O., tel. and R. R. stn. Fernandina, Fla., dist. 3 m.

Columbus Barracks, Ohio. (See Recruiting Depots.)

Columbus Fort, N. Y. (Dept. East).—P. O., New York City; tel. stn. Governors Island, N. Y.; Govt. steamer from N. Y. City, dist. 1½ m.

**Constitution, Fort, N. H.*—P. O. New Castle, N. H.; tel. and R. R. stn. Portsmouth, N. H.; stage or steamer from Portsmouth, dist. 3 m.

Custer, Fort, Mont. (Dept. Dak.).—P. O. and tel. stn. same; daily stage from Custer stn., on N. P. R. R., dist. 32 m.

D. A. Russell Fort, Wyo. (Dept. Platte).—P. O., tel. and R. R. (U. P., D. and G.) stn. Fort Russell, Wyo.

Davids Island, N. Y. (See Recruiting Depots.)

**Delaware, Fort, Del.*—P. O. and tel. stn. Delaware City, Del.; daily steamer from Philadelphia to Delaware City, dist. 2 m. from post.

Douglas, Fort, Utah (Dept. Colo.).—P. O., tel. and R. R. stn. Salt Lake City, Utah, dist. 3 m.; city railway to post.

Du Chesne, Fort, Utah (Dept. Colo.).—P. O. and tel. stn. same; R. R. (R. G. W. R. R.) stn. Price Station, dist. 88 m.; stage line to post.

**Dutch Island, R. I., Fort on.*—P. O. Jamestown, R. I.; tel. stn. Newport, R. I.; steam ferry from Newport to Jamestown, dist. 4 m., and private boat thence to post, dist. 1 m.

**Finn's Point, N. J., Battery at.*—P. O., R. R. and tel. stn. Salem, N. J., dist. 6 m.

**Foote, Fort, Md.*—P. O same; tel. stn. Alexandria, Va.; steamer from Washington, D. C., dist 9 m.

**Gaines, Fort, Ala.*—P. O., tel. and R. R. stn. Mobile, Ala.; boat from Mobile, dist. 30 m.

**Gorges, Fort, Me.*—P. O., R. R. and tel. stn. Portland, Me., dist. 1½ m.

Grant, Fort, Ariz. (Dept. Colo.).—P. O. and tel. stn. same; daily stage (except Sunday) from Willcox, on S. P. R. R., dist. 27 m.

**Griswold, Fort, Conn.*—P. O. Groton, Conn.; tel. and R. R. stn. New London; ferry from New London, dist. 1 m.

Hamilton, Fort, N. Y. (Dept. East).—P. O. and tel. stn. same; city railroad from Brooklyn, dist. 6 m.

Hancock, Fort, Tex. (Dep. Tex.).—P. O. same; tel. and R. R. stn. Fort Hancock Station (on G. H. and S. A. R. R.), dist. 1⅛ m.

Huachuca, Fort, Ariz. (Dept. Colo.).—P. O. and tel. stn. same; Government transportation from Huachuca Siding, on N. Mex. and A. R. R., dist. 7 m.

**Independence, Fort, Mass.*—P. O. and tel. stn. Boston, Mass.; Govt. tug from Boston, dist. 3 m.

Jackson Barracks, La. (Dept. East).—P. O. and R. R. stn. New Orleans, La., dist. 6 m.; street cars from New Orleans pass the post; tel. stn. Slaughter House, St. Bernard Parish, La.

**Jackson, Fort, La.*—P. O. Neptune, La.; tel. stn. Quarantine, La.; steamer tri-weekly from New Orleans, dist. 73 m.

Jefferson Barracks, Mo. (See Recruiting Depots.)

**Jefferson, Fort, Fla.*—P. O. and tel. stn. Key West, Fla.; boat from Key West, dist. 71 m.

**Johnston, Fort, N. C.*—P. O. and tel. stn. Southport, N. C.; steamer daily from Wilmington, N. C., dist. 26 m.

Keogh, Fort, Mont. (Dept. Dak.).—P. O., tel and R. R. (N. P. R. R.) stn. same.

Key West Barracks, Fla. (Dept. East).—P. O., tel. stn. and boat ldg. Key West, Fla.

**Knox, Fort, Me.*—P. O. Prospect Ferry, Me.; tel and R. R. stn. Bucksport, Me.; ferry from Bucksport, dist. ¼ m.

**Lafayette, Fort, N. Y. H.*—P. O. and tel. stn. Fort Hamilton, N. Y.; city railroad from Brooklyn, dist. 6 m.

Leavenworth, Fort, Kans. (Dept. Mo.).—P. O., tel. and R. R. stn. same.

Leavenworth Military Prison, Kans.—P. O., tel. and R. R. stn. Fort Levenworth, Kans.

**Livingston, Fort, La.*—P. O. Grand Isle, La.; tel. sta. New Orleans, La.; steamer weekly from New Orleans, dist. 95 m.

Logan, Fort, Colo. (Dept. Colo.) (10 miles south of Denver).—P. O., tel. and R. R. stn. (D. and R. G. and U. P. R. R.) same.

Mackinac, Fort, Mich. (Dept. Mo.).—P. O. and tel. stn. Mackinac Island, Mich,; boat from Mackinaw City, dist. 11 m., and from St. Ignace, Mich., dist. 5 m.; steamboats from lake ports arrive hourly from June 1 to October 1. During winter by crossing ice, or by boat from St. Ignace, Mich.

**Macon, Fort, N. C.*—P. O. Beaufort, N. C.; tel. and R. R. stn. Morehead City, N. C., dist. 2 m.

Madison Barracks, N. Y. (Dept. East).—P. O., tel. and R. R. stn. Sacketts Harbor, N. Y.

Marcy, Fort, N. Mex. (Dept. Colo.).—P. O., tel. and R. R. stn. Santa Fe, N. Mex.

**Marion, Fort, Fla.* (Dept. East).—P. O., tel. and R. R. stn. St. Augustine, Fla.

Mason, Fort, Cal. (Dept. Cal.).—P. O. Station A, San Francisco, Cal.; R. R. stn. San Francisco, Cal., dist. 3 m.; street cars ½ m. from post; tel. stn. at post.

**McClary, Fort. Me.*—P. O., tel. and R. R. stn. Kittery Point, Me.

McHenry, Fort, Md. (Dept. East).—P. O., tel. and R. R. stn. Baltimore, Md.

McIntosh, Fort, Tex. (Dept. Tex.).—P. O., tel. and R. R. stn. Laredo, Tex.

McKinney, Fort, Wyo. (Dept. Platte).—P. O. and tel. stn. same; stage from Custer Station, Mont., on N. P. R. R., dist. 166 m.

McPherson, Fort, Ga. (Dept. East).—P. O., tel. and R. R. sta. Atlanta, Ga., dist. 4 m.

Meade, Fort, S. Dak. (Dept. Dak.).—P. O. same; tel. and R. R. (F. E. and M. V.) stn. Sturgis City, dist. 3 m.

**Mifflin, Fort, Pa.*—P. O., Paschallville stn., Philadelphia, Pa.; R. R. and tel. stn. Philadelphia, Pa., dist. 5 m.

Missoula, Fort, Mont. (Dept. Dak.).—P. O. same; tel. and R. R. (N. P.) stn. Missoula, Mont., dist. 4 m.

Monroe, Fort, Va. (Dept. East).—P. O. and tel. stn. same; steamers daily from Baltimore, Washington, Norfolk, and New York, and railroad (C. and O.) from Richmond, Va.

**Montgomery, Fort, N. Y.*—P. O., tel. and R. R. stn. Rouse's Point, N. Y., dist. 1½ m.

**Morgan, Fort, Ala.*—P. O. Herndon, Ala.; tel. stn. at post; steamer from Mobile, dist. 30 m.

**Moultrie, Fort, S. C.*—P. O. Moultrieville, S. C.; tel. and R. R. stn. Charleston, S. C., dist. 5 m.

Mount Vernon Barracks, Ala. (Dept. East).—P. O., tel. and R. R. stn. Mount Vernon, Ala.

Myer, Fort, Va. (Dept. East).—P. O. and R. R. stn. Washington, D. C.; telephone to post.

Newport Barracks, Ky. (Dept. East).—P. O., tel. and R. R. stn. Newport, Ky.

Niagara, Fort, N. Y. (Dept. East).—P. O. and tel. stn. Youngstown, N. Y.; R. R. stn. Lewiston, N. Y., dist. 7 m.
Niobrara, Fort, Nebr. (Dept. Platte).—P. O. same; tel. and R. R. (F. E. and M. V.) stn. Valentine, Nebr., dist. 4½ m.
**Oglethorpe, Fort, Ga.*—P. O., tel. and R. R. stn. Savannah, Ga., dist. 3 m.
Omaha, Fort, Nebr. (Dept. Platte).—P. O. and R. R. stn. (F. E. and M. V.) same; tel. (telephone to post) stn. Omaha, Nebr.
Ontario, Fort, N. Y. (Dept. East).—P. O., tel. and R. R. stn. Oswego, N. Y.
Pembina, Fort, N. Dak. (Dept. Dak.).—P. O., R. R., and tel. stn. Pembina, N. Dak., dist. 2 m.
**Phœnix, Fort, Mass.*—P. O., R. R. and tel. stn. Fairhaven, Mass.
**Pickens, Fort, Fla.*—P. O. Warrington, Fla.; tel. stn. Pensacola navy-yard; R. R. stn. at Pensacola, Fla., dist. 10 m.
Pilot Butte, Camp, Wyo. (Dept. Platte).—P. O., tel. and R. R. (U. P.) stn. Rock Springs, Wyo.
Plattsburg Barracks, N. Y. (Dept. East).—P. O., tel. and R. R. stn. Plattsburg, N. Y.
** Popham, Fort, Me.*—P. O. Popham Beach, Me.; tel. and R. R. stn. Bath, Me., dist. 12 m. by water, 15 m, by land.
Poplar River, Camp, Mont. (Dept. Dak.).—P. O., tel. and R. R. (G. N.) stn. Poplar River Station.
Porter, Fort, N. Y. (Dept. East).—P. O., tel. and R. R. stn. Buffalo, N. Y.
Preble, Fort, Me. (Dept. East).—P. O., tel. and R. R. stn. Portland, Me., dist. 1¼ m.
Presidio of San Francisco, Cal. (Dept. Cal.).—P. O. and tel. stn. same; R. R. stn. San Francisco, Cal., dist. 4½ m.; city railway to post.
**Pulaski, Fort, Ga.*—P. O., R. R. and tel. stn. Savannah, Ga., dist. 14 m.
Reno, Fort, Okh. T. (Dept. Mo.).—P. O., tel. and R. R. stn. same.
Riley, Fort, Kans. (Dept. Mo.).—P. O., tel. and R. R. stn. same.
Ringgold, Fort, Tex. (Dept. Tex.).—P. O. Rio Grande City, Tex.; tel. stn. at post; stage from Pena, on T. M. R. R., dist. 72½ m., and from San Miguel, Mex., on Mex. N. R. R., dist. 23 m.
Robinson, Fort, Nebr. (Dept. Platte).—P. O., tel. and R. R. (F. E. and M. V.) stn. same.
Sam Houston, Fort, Tex. (Dept. Tex.).—P. O., tel. and R. R. stn. San Antonio, Tex.
San Carlos, Ariz. (Dept. Colo.)—P. O. and tel. stn. same; daily stage (except Sunday) from Bowie, on S. P. R. R. (via Fort Thomas), dist. 102 m., and tri-weekly from Wilcox, via Forts Grant and Thomas, dist. 106 m.; regular stage to post.
San Diego Barracks, Cal. (Dept. Cal.).—P. O., tel. and R. R. (C. S.) stn. and boat ldg. San Diego, Cal.
**Sandy Hook, N. J., Fort at.*—P. O. New York City; tel. and R. R. stn. Sandy Hook, N. J., dist. 2 m.; Govt. str. from New York, dist. 20 m.
**Scammel, Fort, Me.*—P. O., tel. and R. R. stn. Portland, Me., dist. 2 m.
Schuyler, Fort, N. Y. (Dept. East).—P. O., tel. and R. R. stn. West Chester, N. Y., dist. 3¼ m.
**Sewall, Fort, Mass.*—P. O., tel. and R. R. stn. Marblehead, Mass., dist. 1½ m.
Sheridan, Fort, Ill. (Dept. Mo.).—P. O., R. R. and tel. stn. same.
Sherman, Fort, Idaho (Dept. Columbia).—P. O. Sherman, Idaho; tel. and R. R. stn. Cœur d'Alene, Idaho (on branch N. P. R. R.), dist. ¾ m.
**Ship Island, Miss., Fort at.*—P. O., tel. and R. R. (L. and N.) stn. Biloxi, Miss., dist. 15 m.; special boat to post.
Sidney, Fort, Nebr. (Dept. Platte).—P. O., tel. and R. R. (U. P.) stn. Sidney, Nebr.
Sill, Fort, Okh. T. (Dept. Mo.).—P. O. and tel. stn. same; stage daily from Rush Springs, Ind. T., on C. R. I. and P. R. I., dist. 29 m.
Snelling Fort, Minn. (Dept. Dak.).—P. O., tel. and R. R. stn. same; electric st. R. R. to St. Paul, Minn.
Spokane, Fort, Wash. (Dept. Columbia).—P. O. and tel. stn. Miles, Wash.; daily stage (except Sunday) from Davenport, on N. P. R. R., dist. 25 m.
Stanton, Fort, N. Mex. (Dept. Colo.).—P. O. and tel. stn. same; stage daily from Carthage, N. Mex., on A., T. and S. F. R. R., dist. 100 m.
**Stevens, Fort, Oregon.*—P. O. and tel. stn. (Govt. tel. to post) Astoria, Oregon; steamer daily from R. R. stn. Portland, Oregon, to Astoria, dist. 98 m.; from thence by steam tug daily (except Sunday) to post, dist. 7 m.
St. Francis Barracks, Fla. (Dept. East).—P. O., tel. and R. R. stn. St. Augustine, Fla.
**St. Philip, Fort, La.*—P. O. Neptune, La.; tel. stn. Old Quarantine stn., La.; steamer triweekly from New Orleans, dist. 73 m.
Sully, Fort, S. Dak. (Dept. Dak.).—P. O. and tel. stn. same; R. R. (C. and N. W.) stn. Pierre, S. Dak., dist. 23 m.
**Sumter, Fort, S. C.*—P. O. Moultrieville, S. C.; tel. and R. R. stn. Charleston, S. C. dist. 5 m.
Supply, Fort, Ind. T. (Dept. Mo.)—P. O. and tel. stn. same; R. R. stn. Woodward, Ind. T., on A., T. and S. F. R. R., dist. 15 m.; daily stage to post.

**Taylor, Fort, Fla.*—P. O., tel. stn. boat landing Key West, Fla.
Thomas, Fort, Ky. (Dept. East).—P. O., tel. and R. R. stn. Newport, Ky., dist. 3 m.
Townsend, Fort, Wash. (Dept. Columbia).—P. O. and tel. stn. Port Townsend, Wash., dist. 3 m.
Trumbull, Fort, Conn. (Dept. East).—P. O., tel. and R. R. stn. New London, Conn., dist. 1 m.
Vancouver Barracks, Wash. (Dept. Columbia).—P. O. and boat ldg. Vancouver, Wash.; tel. stn. at post, R. R. stn. at Portland, Oregon; boat from Portland, Oregon, daily, dist. 18 m., and by ferry and city railroad, dist. 6 m.
Wadsworth, Fort, N. Y. (Dept. East).—P. O. Rosebank, Staten Island, N. Y.; tel. stn. Quarantine, Clifton, Staten Island, N. Y.
Wallawalla, Fort, Wash. (Dept. Columbia).—P. O., tel. and R. R. (N. P.) stn. Wallawalla, Wash., dist. 1 m.
Warren, Fort, Mass. (Dept. East).—P. O. and tel. stn. Boston, Mass.; steamer from Boston, dist. 7 m.
Washakie, Fort, Wyo. (Dept. Platte).—P. O. and tel. stn. same; daily stage from Rawlins, Wyo., on U. P. R. R., dist. 147 m.
Washington Barracks, D. C. (Dept. East).—P. O., tel. and R. R. stn. Washington, D. C.
**Washington, Fort, Md.*—P. O. same; tel. stn. Alexandria, Va.; stmbt. from Washington, D. C., dist. 13 m.
Wayne, Fort, Mich. (Dept. Mo.).—P. O. and tel. stn. Detroit, Mich.; city railway from Detroit, dist. 4 m.
West Point, N. Y. (U. S. Mil. Acad.).—P. O., tel. and R. R. stn. same.
Whipple Barracks, Ariz. (Dept. Colo.).—P. O. and tel. stn. Whipple; R. R. (P. and A. C.) stn. Prescott, Ariz.
Willets Point, N. Y. (U. S. Engineer School).—P. O. and tel. stn. same; R. R. stn. Whitestone, N. Y., dist. 2½ m. (See Engineer Depot.)
**Winfield Scott, Fort, Cal.* (Dept. Cal.).—P. O. and tel. stn. Presidio of San Francisco, Cal.; R. R. stn. San Francisco, Cal.
Wingate, Fort, N. Mex. (Dept. Colo.).—P. O. and tel. stn. same; R. R. (A. and P.) stn. Wingate, dist. 3 m.
**Winthrop, Fort, Mass.*—P. O. and tel. stn. Boston, Mass.; steamboat from Boston, dist. 2 m.
Wood, Fort, Bedloes Island, N. Y. (Dept. East).—P. O., tel. and R. R. stn. N. Y. City.
Yates, Fort, N. Dak. (Dept. Dak.).—P. O. and tel. stn. same; Bismarck, on N. P. R. R., dist. 60 m.
Yellowstone, Fort, Wyo. (Dept. Dak.).—P. O. and tel. stn. Mammoth Hot Springs, Wyo.; R. R. stn. Cinnabar, Mont., via Livingston, on N. P. R. R., dist. 8 m.

ARMORIES, ARSENALS, AND DEPOTS.

ARMORIES, ARSENALS, AND ORDNANCE DEPOTS.

Allegheny Arsenal, Pa.—P. O., tel. and R. R. stn. Pittsburg, Pa.; Lieut. Col. F. H. Parker, comdg.
Augusta Arsenal, Ga.—P. O., tel. and R. R. stn. Augusta, Ga., dist. 3 m.; electric R. R. from Augusta to Arsenal; Maj. J. G. Butler, comdg.
Benicia Arsenal, Cal.—P. O., tel., R. R. stn. and boat landing Benicia, Cal., dist. 1 m.; Lieut. Col. L. S. Babbitt. comdg.
Columbia Arsenal, Tenn.—P. O., tel. and R. R. stn. Columbia, Tenn.; Capt. J. E. Greer, comdg.
Fort Monroe Arsenal, Va.—P. O. and tel. stn. Fort Monroe, Va.; stmbts. daily from New York, Baltimore, Washington, and Norfork, and railroad (C. and O.) from Richmond, Va.; Lieut. Col. W A. Marye, comdg.
Fort Snelling Ordnance Depot, Minn.—P. O., tel. and R. R. stn. Fort Snelling, Minn.; Capt. William Gerlach, 3d Inf., comdg.
Frankford Arsenal, Pa.—P. O. (Station F) and tel. stn. (telephone to post) Philadelphia., Pa.; Lieut. Col. J. P. Farley, comdg.
Indianapolis Arsenal, Ind.—P. O., tel. and R. R. stn. Indianapolis, Ind.; Maj. A. L. Varney, comdg.
Kennebec Arsenal, Me.—P. O., tel. and R. R. stn, Augusta, Me.; Maj. J. R. McGinness, comdg.
New York Arsenal, N. Y.—P. O. New York City; tel. stn. Governors Island, N. Y. Govt. steamer from New York City, dist. 1½ m.; Maj. Clifton Comly, comdg.
Omaha Ordnance Depot, Nebr.—P. O., tel. and R. R. stn. Omaha, Nebr.; Capt. J. C. Ayres, comdg.
Rock Island Arsenal, Ill.—P. O. and tel. stn. Rock Island, Ill.; special conveyance from R. R. stns. and boat ldgs. in Rock Island, Ill., and Davenport, Iowa, dist. 2 m; Col. A. R Buffington. comdg.

St. Louis Powder Depot, Mo.—P. O., tel. and R. R. stn. Jefferson Barracks, Mo.; Maj. J. A. Kress, comdg.
San Antonio Arsenal, Tex.—P. O., tel. and R. R. stn. San Antonio, Tex.; Maj. C. E. Dutton, comdg.
Springfield Armory, Mass.—P. O., tel. and R. R. stn. Springfield, Mass.; Col. A. Mordecai, comdg.
U. S. Powder Depot, N. J.—P. O., tel. (telephone to post) and R. R. stn. Dover, N. J. dist., 4½ m.; Col. J. M. Whittemore, comdg.
Vancouver Barracks Ordnance Depot, Wash.—P. O. and boat ldg. Vancouver, Wash.; tel. stn. Vancouver Barracks, Wash.; boat from Portland, Oregon, daily, dist. 18 m.; hourly communication with Portland by ferry and motor line, dist. 6 m.; Capt. H. E. Robinson, 4th Inf., comdg.
Watertown Arsenal, Mass.—P. O., tel. and R. R. stn. Watertown, Mass.; Maj. J. W. Reilly, comdg.
Watervliet Arsenal, N. Y.—P. O. and tel. stn. (telephone to post) West Troy, N. Y.; R. R. stn. Troy, N. Y., dist. 1 m.; electric street cars to Albany, N. Y.; Maj. Isaac Arnold, jr., comdg.

RECRUITING DEPOTS.

Columbus Barracks, Ohio.—P. O. and R. R. stn. Columbus, Ohio; tel. stn. at post; Lieut. Col. John B. Parke, 2d Inf., comdg.
Davids Island, N. Y.—P. O. same; tel. stn. New Rochelle, N. Y.; horse-car and boat from New Rochelle, dist. 3 m.; Lieut. Col. H. C. Cook, 4th Inf., comdg.
Jefferson Barracks, Mo.—P. O., tel. and R. R. stn. same; Lieut. Col. S. S. Sumner, 6th Cav., comdg.

ENGINEER DEPOT.

Willets Point, N. Y.—P. O. and tel. stn. same; R. R. stn. Whitestone, Queens County, N. Y., dist. 2½ m.; Lieut. Col. W. R. King, comdg.

HEADQUARTERS OF REGIMENTS.

CAVALRY.

1. Fort Grant, Ariz.
2. Fort Wingate, Ariz.
3. Fort Reno, Okh. T.
4. Fort Wallawalla, Wash.
5. Fort McIntosh, Tex.
6. Fort Niobrara, Nebr.
7. Fort Riley, Kans.
8. Fort Meade, S. Dak.
9. Fort Robinson, Nebr.
10. Fort Custer, Mont.

ARTILLERY.

1. Fort Hamilton, N. Y.
2. Fort Adams, R. I.
3. Fort McPherson, Ga.
4. Washington Barracks, D. C.
5. Presidio of San Francisco, Cal.

INFANTRY.

1. Angel Island, Cal.
2. Fort Omaha, Nebr.
3. Fort Snelling, Minn.
4. Fort Sherman, Idaho.
5. St. Francis Barracks, Fla.
6. Fort Thomas, Ky.
7. Fort Logan, Colo.
8. Fort McKinney, Wyo.
9. Madison Barracks, N. Y.
10. Fort Marcy, N. Mex.
11. Whipple Barracks, Ariz.
12. Fort Leavenworth, Kans.
13. Fort Sill, Okh. T.
14. Vancouver Barracks, Wash.
15. Fort Sheridan, Ill.
16. Fort Douglas, Utah.
17. Fort D. A. Russell, Wyo.
18. Fort Clark, Tex.
19. Fort Wayne, Mich.
20. Fort Assiniboine, Mont.
21. Fort Niagara, N. Y.
22. Fort Keogh, Mont.
23. Fort Sam Houston, Tex.
24. Fort Bayard, N. Mex.
25. Fort Missoula, Mont

ADJUTANT-GENERAL'S OFFICE,
Washington, D. C., October 1, 1893.

D.—*Statement showing gainand loss in the enlisted strength of the Army during the fiscal year ended June 30, 1893.*

GAIN.

Enlisted	7,747
Reënlisted	1,701
From desertion	607
Total	10,055

LOSS.

Expiration of service	2,338
For disability	609
By purchase	1,073
For fraudulent enlistment	301
By favor	112
As veterans	134
For minority	104
Under G. O. No. 80, of 1890	1,573
By sentence of G. C. M	864
For other causes	369
By promotion	10
Died of wounds	1
Died of disease, etc	171
Retired	113
Deserted	1,682
Total	9,454
Enlisted strength, June 30, 1892	24,760
Gain	10,055
	34,815
Loss	9,454
Enlisted strength June 30, 1893	25,361

NOTE.—There were in the Army (included in the strength) on June 30, 1893:

Hospital Corps	786
Signal Corps	49
General service clerks and messengers	168
Total	1,003
Indians belonging to the line of the Army	771
Indian scouts	131

REPORT OF MAJ. GEN. O. O. HOWARD.

HEADQUARTERS DEPARTMENT OF THE EAST,
Governors Island, New York, August 24, 1893.

SIR: I have the honor to submit the following annual report for the information of the Major-General Commanding the Army:

There are at present in the Department of the East, by the last return, dated July 31, 1893, 26 garrisoned posts and 38 posts not garrisoned.

There are in the command 4 troops of cavalry, 41 foot batteries of artillery, 3 light batteries of artillery, and 36 companies of infantry (including 6 skeleton companies), in all present and absent an aggregate, including medical corps, etc., of 400 commissioned officers and 4,656 enlisted men. Of these, 219 officers and 4,164 enlisted men are present.

The posts not garrisoned are each in charge of an ordnance sergeant, except Forts Lafayette and Marion, which are in charge of the commanding officers of Fort Hamilton and St. Francis barracks, respectively.

Further particulars in regard to these posts and troops will be found in detail in the roster appended hereto, marked D.*

THE PAST YEAR.

In my last annual report I dwelt at some length upon the labor disturbances which had occurred within the limits of the Department of the East. These were intently observed by officers of the regular Army, but fortunately the United States forces were not called upon to bear any part in settling the troubles. All was done very promptly and thoroughly by the National Guard. This year there have been no new conflicts of importance, and no cause to bring into active service any portion of this command. The appropriations having been, for purposes of transportation, greatly limited, I have not been able to give to all the command outside camps and marching, particularly in conjunction with the National Guard, so much as heretofore, or as would seem desirable. There have been, however, instances of united action in drilling, marches, and encampments, all of which have tended to increase good feeling and promote in many ways the efficiency of the military service.

It is evident from the information received that there has been constant activity on the part of the Engineer Corps in pushing on to completion mortar batteries and works containing the disappearing-gun emplacements. Several are nearly ready for their armament. New ordnance also has been under experiment by the Ordnance Department, but none of the modern rifled guns, except in one instance, have been placed during the last year in any of the permanent works which defend the harbors on this coast.

No posts in the department have been abandoned, there not having been barrack room; even the post of Newport Barracks, though suffering from age and overflow, has been retained. Key West, it will be

* Omitted.

noticed, has been reoccupied by one battery of artillery, and it is thought that these troops may be kept, by judicious watchfulness, as free from danger from contagious diseases there as at any other Southern station. I hope the garrison may be doubled as soon as the buildings can be made fit to receive the additional battery.

At St. Augustine, where we have the headquarters of the Fifth Infantry, two companies and the band, the grounds for the garrison are too cramped, and the barracks for the men so limited as to endanger the health of the command. Congress having failed to carry out previous recommendations for enlargement of the reservation, after a personal inspection I became thoroughly convinced that our wisest plan is to build a new post; it will be the best economy in the end, as the desire on the part of all concerned is to have larger garrisons. With these objects and other needs of the service in view, I have recommended a much larger reservation than the old. Upon Anastasia Island, on public land, I found a good location, good water, with plenty of building material near. It is close enough to the city of St. Augustine for all conveniences. I anticipate that the reservation, which I understand has been approved by the honorable the Secretary of War, will be set apart in formal orders, probably, before the publication of this report. At any rate, I decidedly recommend this new reservation and the appropriation of sufficient money to begin the construction. Two hundred thousand dollars will probably be enough, at least to provide for the present garrison, under the evident pressing necessity.

I have visited the new cavalry post, Fort Ethan Allen, now under construction at Burlington, Vt. The work is in good progress and bids fair to make a station, in every way desirable, at an important point near our Northern frontier. I would recommend the securement, before it is too late, of a strip of land between the public grounds and the small river which runs in front of them. Of course the river will be an advantage, and the possession of this strip a guard against the otherwise inevitable proximity of undesirable shanties. On the other side of Lake Champlain, at Plattsburg Barracks, the enlargement of the reserve had been made, and the constructions are many of them near completion. The quarters for men and officers will be thoroughly ready for occupancy in the early spring of next year.

In the centennial celebration last October the troops from Madison Barracks and along the Atlantic coast joined those stationed around the harbor of New York. All these, the Engineer Battalion being a part, formed a creditable portion of the grand column that marched in procession along the streets of New York and passed the stand where the Vice-President and others reviewed them. Our troops received special commendation for their marching and good appearance. On a smaller scale a similar procession, assisted, also with pleasant mention, at the naval review on April 28, and during the memorial exercises of May 30. In this last a part of the troops in the harbor, as directed by the Secretary of War, participated in like manner in the Brooklyn ceremonies.

The only addition to the troops of this department during the past year has been Company I, Tenth Infantry (Indians), which came from the Department of Arizona and took station at Fort Barrancas, Fla., April 7, 1893. This company (Indians) was afterward, under orders from the Headquarters of the Army, transferred to the Ninth Infantry, Company I, and is now temporarily at Fort McPherson, Ga., with other troops from Fort Barrancas, owing to the appearance of yellow fever in Pensacola. A report of other changes and movements of the

troops within the department will be found in the "Record of Events" appended hereto, marked E.*

The Columbian Exposition at Chicago has occásioned a large depletion of the number of officers in the department in two ways: First, by the number of details that were demanded for duty there, and second, from the almost universal desire to visit the Exposition. I have approved leaves of absence to such an extent as to make an unfavorable showing in the inspections and reports on this account. The officers, however, have thus far very cheerfully favored each other, readily doing double duty during the absence of their fellow officers. Certainly the Exposition itself is a condensation of knowledge and a source of interest and profit to all who have attended.

It may be well in this connection to notice the number of officers who are absent detached as instructors at military institutions of learning; they do excellent service, and within the limits of this department are inspected and reported upon by my inspector-general and his assistant. It is, however, a detriment to batteries, troops, and companies to be obliged to allow so many absentees. Out of a total of 289 company officers (skeleton companies included), 89 officers, 30.79 per cent, are permanently detached for college duty, with militia, duty at Columbian Exposition, on recruiting service, at military academy, at service schools; disabled and on other important duty, not including skeleton companies, the total of company officers is 272, absent 74 officers or 27.20 per cent; short absences on leave are not considered in these figures. Of the company officers (skeleton companies not included), 69 officers, or 25.37 per cent, are absent on detached service under orders from superior authority.

It is hoped that much of this absenteeism may be remedied by such legislation as will abrogate the necessity of separating such a large number of officers from their proper commands. A mistake prevails outside of the Army that because we are not in active service—that is, actual war, the commissioned officer has little to do. If one will examine into facts he will see that with so small a force, and such an immense extent of country to cover, the art of war to cultivate and public property to protect, the peace establishment is far from being in any sense a sinecure; and again it is a maxim well established that the preparations which involve instruction, discipline and provision require as much energy and effort as actual campaigning. Believing this to be true any policy that separates a large proportion of the commissioned officers from their regiments is certainly ill-advised.

THE TROOPS.

Judging by the reports of the inspectors, of the post commanders, and from my own personal observation, the infantry drill and rifle firing, with its competition, have been throughout the department all that the instructions have demanded and are, in general, excellent. The inspector-general, however, remarks in his reports concerning an insufficiency of "practical work in drill regulations—the noncommissioned officers are slow in taking hold of the spirit of the new method." This criticism arises from the difficulty of changing old habits to new. He justly remarks that "time and plenty of practice will cure this deficiency." There is also another feature which will receive attention It is what the inspector denominates "work done in extended order." Undoubtedly to give a practical turn and perfect the troops in the "extended order," they must be assembled in larger bodies, as has

* Omitted.

been done heretofore in marches, and continued long enough for such drill in summer encampments. The limited appropriation has hindered these during this year. With reference to the target practice another suggestion is offered to the effect that competitions for medals should include moving targets, and test of the men's proficiency in estimating distances; doubtless it is wise to institute any practicable method of securing this efficiency, for active service would, more than ever before, demand this skill of the individual soldier.

For the infantry I have sought in every way to keep alive the interest in their target practice. In a few days I shall go to the department competition at Fort Niagara to witness the closing contest, and to deliver the medals, as I have heretofore done each year. The vigorous competitions as there evinced have a marked influence to encourage the competitors in habits of self-control, self-denial, and manliness that has not, I believe, abated from the beginning of this kind of discipline and drill. We are obliged to have in the soldier of to-day self-reliance and individuality in a marked degree. The faithful and continued target practice affords the best contributions to this desirable object.

With regard to the artillery instruction, it appears to me that all the teaching and practice have been preliminary., The inspector of artillery shows that "there is much interest taken in all the regiments in artillery practice, notwithstanding the fact that the guns and mortars used are antiquated and some of the powders equally so." It is simply impossible to make practical artillerymen without their proper armament; so that we are looking forward to perfecting this drill when the new field guns, almost ready for issue, shall be sent to each post garrisoned by artillery. At most of the posts practice will be practicable, and certainly the instruction be something besides mere theory. The recommendation of the inspector of artillery to use Fort Carroll for heavy artillery practice for the batteries from the neighboring posts of of Fort McHenry and Washington Barracks, I concur in. The greatest need just now is that modern guns of the larger caliber be completed and put into emplacements, at least a sufficient number of them to accustom the troops to their actual use before any sudden emergency shall arise. In time of war the heavy artillery, too few in number to man our forts of defense, should at least be so thoroughly instructed and in such excellent practice as to make it the proper nucleus of the larger body that would gather around it, and cause at least the most intelligent soldiers to become instructors in practical artillery; that is, in the skillful handling of our modern guns. The department inspector recommends that the artillery be allowed more shots. Doubtless this is practicable while the old armament and material are used, but it is doubtful if much efficiency be gained without the new guns themselves. The inspector further criticises the constant firing at a stationary object, and notices how essential it is to have practice with moving targets. Surely in war both fixed and moving targets will be brought under fire. His recommendation for a sub-caliber gun for heavy artillery is well timed; artillery practice is always expensive enough at the best, and it may be well for us to consider how to supply a sub-caliber for those posts selected for the general artillery exercise. It should be borne in mind that we have always demanded of our artillery soldier a double preparation. He is to be prepared for the using of heavy guns, and is at the same time thoroughly drilled and instructed as an infantryman. Of course, we can not expect as much proficiency in him as we would were he confined to one arm or the other. From the experience of the war, however, it appears to be wise that the members of our

small Army should have as wide a range of knowledge as possible. The artilleryman will never be confined to heavy artillery; many of the batteries will be converted at once to field batteries or horse artillery; and other batteries will, as experience shows, be used as infantry. There is only one way to confine artillery, cavalry, and infantry soldiers to their specialty, and that is by increasing the peace establishment, not to a large army, but to one somewhat more commensurate with the increase of our population and the needs of our time.

Only three light batteries are in this department: K, First Artillery, at Fort Hamilton; C, Third Artillery, at Washington Barracks, and B, Fourth Artillery, at Fort Adams. The instruction and drill in this arm are satisfactory.

Light Battery K, First Artillery, made a very creditable march, in conjunction with the batteries and other troops of the National Guard of New York, to the State encampment at Peekskill and back to its post. The exercises at the camp have received marked commendation.

Light Battery C, Third Artillery, has already made a fairly long march to Gettysburg and back, being present on the occasion last July of the unveiling of the New York monument on the battle field. The officers there in charge said that the battery did capital work. A march for this battery to Aldie, Va., to hold its annual artillery practice has also been authorized.

Light Battery B, Fourth Artillery, which a year ago did itself so much credit in its marches and drills during what was called "the Bennington expedition," has proposed a march to Cape Cod peninsula as far as Provincetown and return. This has been approved; will begin about September 1, and will no doubt be of great benefit to the battery.

The light batteries, I believe, without exception are always kept in readiness for active service. The inspector of artillery has one remark slightly in abatement. He says: "The want of proper range prevented Light Battery C, Third Artillery, stationed at Washington Barracks, from having practice." But it has since been arranged. This subject of providing for target practice for the batteries, both heavy and light, is surrounded with difficulties, and it may yet demand legislation to effect what every commander so much desires; that is, an opportunity to acquire the skill and facility that can only be attained by abundant practice.

There is but one cavalry post, Fort Myer, Va., in this department. The reports have shown a careful attention to drill, but there has been no carbine practice, as the inspector of small arms says:

> There being no range at the post where practice can be held without endangering life and property.

I approved a march to Sea Girt, New Jersey, where the State tendered the use of a range, but for the want of the necessary funds the march was not authorized. The post commander, Lieut. Col. Guy V. Henry, especially urges that his battalion have an opportunity annually for a practice march by squadron. He remarks that it is only by such marches that the efficiency of cavalry is kept up. On some public occasions the troops have been used in Washington, and I have been very desirous to give them outside encampments requiring lengthy marches; but this year's pressing necessity for economy has caused the disapproval of every request looking to these exercises. The expense, however, would not be great; but for tolls, camp grounds, and extra transportation some outlay is a prerequisite.

With reference to a target range at this station I will make another effort to secure one near enough to the post; and if, owing to the fears

and opposition of civilians, this proves to be still impossible, I can send the troops in detachments to some artillery post where there are limited ranges for partial practice.

GYMNASTICS AND CALISTHENICS.

In the northern and middle portions of this department especially, where the winters are long, it is customary to introduce more or less athletic exercise with a view to keep the men in health and vigor. These exercises are more essential now than ever before, when we are forced to rely so much upon the intelligence, activity, and energy of the individual man. I concur fully in Col. Closson's suggestion "that measures be taken to make provision and supply facilities and material for gymnasium and athletic exercises obligatory on the quartermaster's department, according to some general plan to be formulated by proper authority." The gymnastics of different sorts, I believe, have a wholesome effect in keeping up the *morale*, especially of the men at garrisons a little remote from cities, where they are obliged to rely upon home efforts for exhilarating amusements.

COURTS.

Especial attention is called to the large number of trials by courts-martial. There is a diminution of 36 in the number over the preceding year. For the discipline of the command, undoubtedly, the putting of even trivial offenses before a court, whether general, garrison, or summary, is a good proceeding, but it does not make a good showing to those who judge the Army adversely by the number of trials by courts-martial. The number of trials for desertion from last September to July 31, 1893, is 118—17 less than the year before. These cases come from all parts of the Army. Deserters naturally drift toward the Eastern cities. Many of them, tired of their deplorable condition, surrender themselves to the city authorities or the nearest garrison. For a time it was believed that our abundant legislation and regulations in the interests of the enlisted men—shortening the period of service, enabling those with a good record to purchase their discharge, diminishing the punishments for offenses—would cause much less desertion in the Army. But the results in this respect are a little disappointing. One act of Congress has worked differently from what its friends predicted, viz, the one that prevents a soldier who has served ten years from reënlisting. This law causes those who wished to continue the military life as a profession to seek other employment even before the expiration of a first enlistment. It cuts off the hope of honorable retirement and of the Soldiers' Home. I strongly recommend a repeal of this law. Our enlistments in our immense population are too few to get substantial benefit from the very short service and so frequent replacement of citizen soldiers. On the subject of desertion I have no other recommendation to make.

INDIAN SOLDIERS.

Company I, Twelfth Infantry, attached to the post of Mount Vernon Barracks, Ala., has been, and is still, a model company of Indian soldiers. Judging by the reports of inspectors, of the officers in charge, and by my own personal observation, I would say that the enlistment of Indian soldiers has not quite come up to our expectations; for even with this company, neat, well disciplined, and fairly well drilled as it is, we can not

help saying that Indians are not white men. It is a hardship to place our white soldiers, when on guard, under ignorant Indian corporals and sergeants. It is impossible for the individual Indian in years to gain the knowledge every white soldier attains in a very short time. This being the case, it appears to my judgment that it is wise to employ the Indians outside of the regular regimental organizations, as heretofore, as army scouts. They make the best skirmishers and scouts when under effective discipline and able command. Now as these are my conclusions, and they are against my first thoughts and hopes concerning the Indians when regarding the best company, they are more than confirmed by a watchful care and observation of the second company, now I, Ninth Infantry, sent to my department for the purpose of discipline. The conduct of this company since its arrival has been good; but the feeling of every officer concerned is that it is uphill work to keep them in heart and health, and to attain to any reasonable reliance upon them for efficient service in case of active work against any foe. As skirmishers, or as scouts and trailers, which are never really depended on, except to clear the way and bring information or hold an enemy at bay, the Indians can be used now as always; but I would not feel the same confidence, certainly not while they can scarcely be made to speak a word of English, in them that I do in other Americans, not excluding the negroes.

RECRUITING.

The regimental recruiting has not, for the most part, worked well. There have been large numbers of applications, but few have been found equal to the requirements of the service. The character of the recruits has not been so much in advance as was hoped, of those who have come from the general recruiting service. The system has kept many officers away from other important duties; and the extra expense, to which the officers selected to do this duty have been subjected, has created considerable discontent. The inspector-general of the department, comparing the two systems, remarks that the recruits cost just about as much one way as the other. He further says:

> If the general recruiting service can secure all the men needed to fill the ranks to the authorized strength, it might be well to relax, in some measure, and in certain districts, present requirements in this service.

There are some exceptions to these conclusions, more particularly at Fort Monroe; the complete reports of the recruiting from that post afford great satisfaction. The commanding officer, Lieut. Col. Frank, in sympathy with his recruiting officers, has instituted methods of giving contentment to the new recruits and disseminating information regarding the service, thus to secure men of good character, and in sufficient numbers for the want of his large garrison. If it is thought best to continue the regimental system, I recommend that some provision be made, as is done in the case of the general recruiting service, to prevent the heavy burden of expense now devolved on those officers who are sent out. A special commutation of quarters might afford the necessary relief.

It will probably come to you from all quarters that there is more difficulty in getting recruits, that is, the best sort of men, since the limitation by law prevents reënlistment after ten years. This affects every man who desires to enter the Army and make it his life profession. The Army in fact is fast losing its best men for the same reason. It is a mistake to suppose that in all cases the younger men are the

most capable and the most desirable. The older soldiers of good character always give loyalty and stability to the ranks. Surely the interests of the Government will be best subserved by retaining those good, efficient, and contented men while they are in their prime, and as long as their health and strength continue.

DISCIPLINE.

I am glad to be able to say that the discipline of the command is most favorable. The courts, as we have seen, have been many; but they are now necessarily used for slight offenses, and the number of these largely prevails over those of a more serious character. When we come to speak of the post exchanges we will see how the lighter offenses, and those attended to by the summary court trial, by a single officer sitting as a judge, have been increased. There is of course the usual restlessness in garrisons which are kept for some time in one place without change; but there is very little show of discontent and few cases indeed of disobedience of orders.

POST LYCEUMS.

The abstracts which accompany this,* of the reports of post commanders, showing the work accomplished in post lyceums in this department during the past year, exhibit on the whole a commendable zeal in professional study and enterprise. Many of the papers read would, if published, prove of much interest and profit to the service at large, and if those approved for such publication by post and department commanders could be forwarded to the Division of Military Information, and such as might be approved by the Commanding General, be published to the Army, I think it would add a stimulus to officers in this work as well as be of advantage to the service.

THE POSTS.

All are looking with expectation for the new magazine arm which it is reported will be ready before many months.

Under new constructions, the Chief Quartermaster of the Department reports as recently erected or in process of erection:

Fort Barrancas, two bath houses; Governor's Island, two double sets of officers' quarters (nearly completed), one double set of officers' quarters (just commenced), and a coal shed on the dock; Fort McHenry, kitchens for three sets of noncommissioned staff officers' quarters; Fort McPherson, an addition to quartermasters' storehouse and a band stand, and converting old guard house into a schoolroom; Fort Monroe, a stable and wagon shed, and converting Carroll hall into company barracks; Fort Niagara, a guardhouse; Fort Trumbull, a bath house; and at Jackson Barracks, a quartermasters' storehouse. In addition to the foregoing, there are under construction at Key West Barracks two single sets of officers' quarters and a mess hall; and buildings are being erected at Plattsburg Barracks and Madison Barracks, under the direction of officers reporting direct to the Quartermaster-General, the cost of which is not included in this report.

In addition to these, besides the administration building just authorized for Fort Monroe, another is greatly needed at Fort Adams, and still another at Fort Hamilton. It is difficult to do the public business without proper office room which the administration building furnishes; besides, it embraces the requisite schoolroom and lyceum hall. There is still some trouble in securing rifle ranges for Madison Barracks, Fort McPherson, and Fort Meyer. Some means also are required to put in order the one at Plattsburg Barracks. It is exceeding-

* Omitted.

difficult to select and keep by leasing or purchasing a range which will not be complained of or proceeded against by the inhabitants who live in the vicinity.

I again call attention to my recommendation for a proper building at Fort Columbus which shall serve for the purposes of a gymnasium, the lyceum, and the schools. This post is so near the city, and is so limited in area, that we need some attraction to keep the men at home and away from evil resorts, as well as to promote physical development and encourage manly exercises. In the winter season it is especially dull, and this building, with a gymnasium and room for lectures and other exercises, would be in every way of very great advantage.

Castle Williams, which is used for all prisoners en route to Fort Leavenworth, and for convicts confined at Governors Island, is sadly in need of repairs. It certainly should not be allowed to crumble down little by little. A small appropriation from year to year will keep it in a safe and presentable condition. It is a venerable historic construction, and need not be dispensed with.

I concur with the post commander that the post cemetery at Fort McHenry be removed to the Loudon Park National Cemetery, and that there be no more burials at the post. New quarters, one for the commanding officer and two for captains, are necessary. What has just been said with reference to Castle Williams applies to this fort also. Doubtless the Engineer Corps will attend to this matter. The sea wal must be extended. A garbage crematory has been recommended and estimated for. There appears to be a nuisance near this small reservation which is simply intolerable; it is the dumping of city night soil on the river bank, being loaded into scows near the post. The interposition of the honorable Secretary of War may be necessary to secure its abatement.

Two or three times I have approved requisitions for ice machines at the southern posts. One is particularly necessary at Mount Vernon Barracks for the proper preservation of perishable meats, vegetables, and fruits. There is engine power enough already at the post, so that the cost will be small.

I recommend the proper appropriation to enable the garrison of Fort Trumbull to have a good road to and from the city. Every year puts the approaches to the fort in worse condition, a condition not creditable to the United States. The expense is estimated, that is, the United States' portion of it, at $1,500 to extend Walbach street, cut through the intervening rock and make the proper repairs to the existing road.

Washington barracks very properly calls for a shelter for ordnance material and for a new guardhouse, one of modern construction and adequate to the necessities of the post. There is here also an intolerable nuisance in the shape of a soap and fertilizer factory close at hand, which, it is hoped, may be abated at an early day.

At several posts in this department, Forts Warren, Adams, Wadsworth, Hamilton, and Monroe, there are still many casemates in which enlisted men, and some commissioned officers, are obliged to live. Some are better than others, but all are objectionable on account of dampness. As they become older they grow worse, occasioning or aggravating sickness. They appear to be universally disliked by their occupants, especially on account of their injury to health, so that I hope that at each of these posts the new construction of outside buildings will be favored by the administration and Congress till they shall all be disused for such purposes.

POST SCHOOLS.

The adjutant-general of this department has submitted some excellent suggestions concerning our post schools that deserve attention. For the purpose of emphasizing his recommendations, I quote them:

> At several of the posts it will be seen better buildings for the accommodation of the schools are much needed. There is great difficulty in obtaining suitable teachers for the enlisted men's school; a schoolmaster sergeant for each post, with the rank and pay of a hospital steward, would give a much needed strength to the post schools system; many of the pupils would be glad to avail themselves of instruction in the elements of the physical sciences, as well as the common branches of education. A diploma, after acquiring a good knowledge of reading, spelling, writing, arithmetic, geography, and history of the United States, exempting its holder from further compulsory attendance, would give encouragement to learners and be of use after the soldier's discharge. In considering this subject it is necessary to notice two classes of soldiers—those who attend school as a part of their military duty and those who attend voluntarily to improve themselves; it seems every way advantageous to encourage the first class by a diploma and the second class by affording the facilities for improvement now found in all the settled portions of our country. Col. Closson, of the Fourth Artillery, until lately commanding at Fort McPherson, during the last year carried on the school for enlisted men with especial success, concluding it with examinations by a board of officers and a special mention in orders of those meritorious.

We can not do too much, first to secure men of proper intelligence and then to give them adequate instruction. Properly managed schools secure the most desirable results.

POST LIBRARIES.

In this same line of education the post library has been a useful institution. Concerning them the adjutant-general remarks:

> Post libraries are much in need of assistance; there is little or no means of renewing them and something is needed in this line, either from an appropriation, the exchange fund, or a small tax on each individual of the garrison, say 50 cents a year from each enlisted man and a proportionate sum from the officers. Efforts in this direction would be most advantageous to the service.

Whether these methods of aiding the libraries may be the best I am not able to say; but I believe it would not be amiss if the Government, through the Quartermaster's Department, on the recommendation of the post council of administration, approved by the post commander, should be made to perform this service, thus adding from time to time to the libraries books of interest and profit. Of course, the number of books would be limited to the amount of appropriation that could be secured for this purpose. A few dollars annually at each post would go a great way toward furnishing interesting reading matter to the soldiers of the garrison.

POST EXCHANGES.

Many of the "post exchanges," which have replaced the canteens, have been prosperous. The proceeds have been used, as far as practicable, for the soldiers' benefit; but several officers still allege many objections to the influence of the beer feature. The tendency of having the beer (which intoxicates) controlled in its purchase and sale by a commissioned officer and dealt out to the command, whether by enlisted men or hired civilians, is to encourage drinking, to cover the faults of those who take too much, sometimes taking good care of them till "the bad effects are slept off," and to give, in any case, a United States sanction to the business. Offenses, I believe, are uniformly increased under this system of beer selling. Drunkards are doubtless

sometimes moderated and restrained when they can be induced to confine themselves to beer; but the new men who, for the desire of social advantage, learn to drink in "the post exchange," or strengthen a habit already begun, far overbalance in numbers those who are saved from the stronger beverages by strong beer. There is no need to discontinue the post exchanges. They can have all the advantage of lunches and the stores needed by the men, mineral waters, tea and coffee, and whatever coffeehouses proper usually furnish to give a pleasant social resort without the injurious effects of intoxicants. The constant argument that of two evils wise men will choose the least will not hold when it is thoroughly practicable to choose neither. It ought to be universally known that the Army as a whole not only seeks to be free from the vice of intemperance, but desires that the whole tendency of its provisions be to make men better and more self-respecting, and that it shall be what every true patriot desires—a good profession for the sons of our best people to seek for their life work.

STAFF DEPARTMENTS.

QUARTERMASTER'S DEPARTMENT.

The work in this branch of the service has already been alluded to; its duties have been economically and efficiently performed throughout the department during the past year.

SUBSISTENCE DEPARTMENT.

The chief commissary of subsistence ably administering his department reports:

> The supplying of posts has been carefully regulated by the rates of consumption and the keeping qualities of the articles, respectively, and the stores issued have been as fresh as possible, and the losses thereon by deterioration very small.
>
> Generally, the stores supplied have been of satisfactory quality. A few complaints as to the inferior quality of the fresh beef delivered by contractors have, however, been received. By a more rigid enforcement of the stipulations of the contracts, which, in such cases, has been enjoined, it is expected that the evil complained of will be abated.
>
> Requisitions have been prompty filled; contracts have been made in accordance with law; accounts have been promptly paid.

No complaints have reached me touching the commissary supply during the year.

MEDICAL AND HOSPITAL CORPS.

The medical director of the department says that, with the exception of Madison Barracks, the sanitary condition of the several posts has been generally reported good. The difficulty at Madison Barracks was doubtless the contamination of the water supply, which at that time was drawn from the bay, and not far from the mouth of the sewer; this defective arrangement has been long since remedied. There is another danger quite imminent from "the defective condition of the sewerage of the hotels on the reservation at Fort Monroe." It seems next to impossible to get this matter properly attended to, though the past year no very serious illness has been occasioned by this bad sewerage. Many times the officers of Fort Myer have pleaded for a better water supply. They need better drinking water than they have and for all purposes water in greater abundance for bathing and for flushing the sewers. It is hoped that this matter at a post so near the

Capital may be speedily remedied before further severe illnesses begin to make their appearance. Much attention has been given this year to the drills and instruction of hospital nurses and attendants, and those "that make up the hospital corps" in first aid to the wounded. The results are most commendable. The medical director also recommends an increased attention to the drill of company bearers, and truly says, in substance, that unless regularly and thoroughly instructed they will be of little use.

PAY DEPARTMENT.

The work of the pay department has been entirely satisfactory to the command.

SIGNAL SERVICE.

Especial care has been taken to have the signal service work kept up to the standard, and with fair success. The inspector-general mentions the "construction, operation, and taking down of lines of communication," and also the use of "balloons" for obtaining reliable information, none of which are in vogue in this department. While I regard these methods of gaining and sending information, and consider them of importance, yet it has not been quite practicable to introduce them in this department in time of peace. I understand, however, that the officers of the signal corps are making a careful study of these helps, and will get practice as soon as large field operations are in demand. I learn, further, that our enterprising chief signal officer is perfecting the preparations and appliances for field telephones to be used when required; these will be of great advantage.

INDIAN PRISONERS OF WAR.

The Indian prisoners of war are still at Mount Vernon Barracks, and by the last report number as follows: 31 men, 157 women, 18 boys and 5 girls over 12 years of age, and 62 boys and 54 girls under; total 327. On September 1, 1892, the number was 33 men, 162 women, 12 boys and 5 girls over 12 years of age, and 67 boys and 61 girls under; total 340. Under the very judicious management of Capt. Wotherspoon, of the Twelfth Infantry, supported by his post commander, they have made commendable progress in adapting themselves to the ways of civilization and in behavior. Capt. Wotherspoon, in his communications, has uniformly commended the self-denying teachers who have for several years prosecuted the work of instruction among the children.

The civil authorities have done what they could, under existing laws, to prevent the demoralization of these Indians through liquor-selling. Col. M. D. Wickersham, United States attorney for the southern district of Alabama, has written me a communication, which indicates what legislation is necessary to remedy present defect in the laws when applied to these people. I invite your attention to this letter, which is hereto appended, marked R.*

COAST DEFENSE.

It is, of course, not necessary to report again upon the coast defenses. Liberal appropriations have already been made, sufficient to make a beginning in the proper protection of our harbors, so many of which

* Omitted.

are in this department. The rapid development of the Navy and the encouragement of the naval reserves have placed that branch of the service considerably ahead of the permanent works on this coast. This is doubtless for the best; but it may be remembered by all of us that the Navy's work, in case of war, is rather in the offensive than the defensive establishment; so that for the defensive purposes the permanent works, the seacoast batteries, including mortar shells and other projectiles, and all the modern torpedo preparations must be kept in mind. There has been a good beginning, but I urge for these purposes, in connection with the work of the Engineer and Ordnance Corps, the most liberal support. The best economy in the long run for the Government is to continue these works, when once commenced, without other periodical interruptions than those occasioned by the severity of the winter months. Certainly the most important ports, like those of New York, Boston, and New Orleans, need the first attention; but the defense will be far from what it should be until such cities as Philadelphia, Baltimore, Washington, those near Hampton Roads, Charleston, Savannah, and Mobile shall be properly covered by defensible works, well manned, with modern ordnance. Certainly, besides, the provisionary garrisons, which we are locating well on our Northern frontier, will be very incomplete without a few substantial and reliable forts. A small fort well defended till the accession of sufficient help has often saved an entire province. But, of course, the practicability of concentrating and moving masses of men northward with great rapidity renders fortifications near the lakes of less importance than the other parts of our extended coast. Yet it seems to my mind the wisest policy to have them at the most important points along the Northern and Eastern frontiers.

IN CONCLUSION.

The conduct of the officers of the department during the year has been highly commendable—not a breach of discipline which has resulted in a court-martial; the post commanders have been most attentive to their duties, and given all due attention to their commands. There have been during the year some changes on my staff, both the general and personal; each officer, without a single exception, has done his duty to my satisfaction, and I joyfully record my approbation. In time of peace there is little opportunity for personal distinction and consequent promotion; but those officers who are diligent and studious always attain a measure of distinction which serves them well when the time of trial comes. This distinction is a matter, too, quite independent of rank. I am happy to believe that very many officers in this department have, by fidelity and work persistently performed in their country's service, laid this good foundation, obtaining at least among their fellows a character which will be effective in case of need.

I have the honor to be, very respectfully, your obedient servant,

OLIVER O. HOWARD,
Major-General, Commanding.

The ADJUTANT-GENERAL U. S. ARMY,
Washington, D. C.

REPORT OF MAJ. GEN. NELSON A. MILES.

HEADQUARTERS DEPARTMENT OF THE MISSOURI,
Chicago, Ill., August 25, 1893.

SIR: I have the honor to submit the following report of affairs in my department since my last, dated September 14, 1892.

The following changes of troops in the department have been made:

GAIN.

The Third Regiment of Cavalry (except Troop L, Indians) arrived in this department from the Department of Texas during the month of June, 1893, in compliance with General Orders, No. 36, Adjutant-General's Office, series of 1893, and took station as follows:

Fort Reno, Okla., headquarters and Troops A, B, and K. Fort Riley, Kans., Troops C, E, F, and G. Fort Sill, Okla., Troops H and I. Fort Supply, Ind. T., Troop D.

Troop F, Sixth Cavalry, arrived at Fort Leavenworth, Kans., from Fort Niobrara, Nebr., April 18, 1893. (Special Orders, No, 74, Adjutant-General's Office, series of 1893.)

Troop D, Eighth Cavalry, arrived at Fort Leavenworth, Kans., June 21, 1893, from Fort Meade, S. Dak. (Special Orders, No. 118, Adjutant-General's Office, series of 1893.)

LOSS.

The Fifth Regiment of Cavalry left this department during the month of June, 1893, for station in the Department of Texas, in compliance with General Orders, No. 36, Adjutant-General's Office, series of 1893.

Troops C, D, and G, Seventh Cavalry, left Fort Riley, Kans., December 24, 1892, en route to Fort McIntosh, Tex., pursuant to telegraphic instructions from these headquarters of December 20, 1892.

Troop C, Ninth Cavalry, left Fort Leavenworth, Kans., en route to Fort McKinney, Wyo., April 19, 1893. (Special Orders, No. 74, Adjutant-General's Office, series of 1893.)

Company G, Tenth Infantry, left Fort Reno, Okla., December 30, 1892, en route to Fort Stanton, N. Mex. (General Order, No. 19, Headquarters Department of the Missouri, series of 1892.)

WITHIN THE DEPARTMENT.

Troops B and K, Seventh Cavalry, left Fort Riley, Kans., October 8, 1892, and arrived at Fort Sheridan, Ill., October 9, 1892. (Special Orders, No. 93, Headquarters Department of the Missouri, series of 1892.)

Troop H, Seventh Cavalry, left Fort Sill, Okla., October 9, 1892, and arrived at Fort Riley, Kans., October 11, 1892. (Special Orders, No. 93, Headquarters Department of the Missouri, series of 1892.)

The headquarters and band of the Thirteenth Infantry left Fort Supply, Ind. T., January 4, 1893, and arrived at Fort Sill, Okla., January 6,

1893. (General Orders, No. 19, Headquarters Department of the Missouri, series of 1892.)

Company A, Thirteenth Infantry, left Fort Sill, Okla., January 3, 1893, and arrived at Fort Reno, Okla., January 5, 1893. (General Orders, No. 19, Headquarters Department of the Missouri, series of 1892.)

Company D, Thirteenth Infantry, left Fort Sill, Okla., June 6, 1893, and arrived at Fort Reno, Olka., June 7, 1893. (Special Orders, No. 55, Headquarters Department of the Missouri, series of 1893.)

Company D, Nineteenth Infantry. left Fort Mackinac, November 27, 1892, and arrived at Fort Brady, Mich., on the same day. (Special Orders, No. 115, Headquarters Department of the Missouri, series of 1892.)

The following troops were ordered to Chicago, October 19, 1892, to take part in the ceremonies incident to the dedication of the World's Columbian Exposition buildings:

From Fort Leavenworth, Kans., headquarters and band; Twelfth Infantry, Companies H, Seventh; F, Tenth; F, Twelfth; and F, Thirteenth Infantry.

From Fort Mackinac, Mich., Company D, Nineteenth Infantry.

From Fort Reno, Okla., headquarters, band, and Troop C, Fifth Cavalry.

From Fort Riley, Kans., Light Batteries A and F, Second, and F, Fourth Artillery.

From Fort Sheridan, Ill., Troops B and K, Seventh Cavalry, Light Battery E, First Artillery, and the Fifteenth Regiment of Infantry.

From Fort Sill, Okla., Troop D, Fifth Cavalry.

From Fort Wayne, Mich., the band and Companies A, E, and G, Nineteenth Infantry.

From Fort Meade, S. Dak., Troop L, Third Cavalry (Indian).

From Fort Snelling, Minn., headquarters, band, and Companies A, E, G, and H, Third Infantry.

From Fort Niobrara, Nebr., the band and Troops F, G, and L (Indian), Sixth Cavalry.

From Fort Omaha, Nebr., headquarters, band, and Companies A, C, D, and F, Second Infantry.

From Fort Robinson, Nebr., Troops A and F, Ninth Cavalry.

From Washington, D. C., the Marine Band and four companies of U. S. Marines.

Recapitulation.

Troops.	Number of companies.	Strength.		
		Officers.	Enlisted men.	Total.
Brig. Gen. E. A. Carr and staff	.....	5	.....	5
Medical Department and Hospital Corps	.....	9	23	32
Signal Corps	.....	1	6	7
Cavalry	10	32	593	625
Artillery	4	14	221	235
Infantry	24	84	1,315	1,399
Total U. S. Army	38	145	2,158	2,303
U. S. Marine Corps	4	15	200	215

The operations of these troops while in Chicago were fully explained in my letter dated January 26, 1893, a copy of which accompanies this report.

No serious Indian hostilities have occurred in the department during the year.

As in previous years, the troops in the Indian Territory have been occupied during much of the time in removing trespassers from the public lands, in preserving order in the newly-settled region, and in keeping the peace between hostile factions of the semicivilized Indian tribes. These difficult duties have been performed in a manner which shows good judgment and discretion on the part of the officers and a good state of discipline and faithful service on the part of the troops.

The inspection reports also show that good administration is preserved at the different posts in the department, and that the garrisons are efficient and well disciplined.

I would respectfully recommend that so much of the act of Congress as prohibits the reënlistment of soldiers who have served for ten years, but less than twenty, or who are over thirty-five years of age, be repealed. The effect of this legislation is, in my opinion, injurious to the Army, depriving the Government as it does of many experienced, heroic, and patriotic men, whose presence in the service would from every point of view promote its efficiency and character.

I again renew the recommendations contained in my report for 1889, and referred to in my last report, under the heads of "Recommendations" and "Promotions."

Accompanying this report are the reports of the staff officers at these headquarters; also a tabulated statement of the work done by post lyceums in the department, established in compliance with General Orders, No. 80, series of 1891, Adjutant-General's Office.

Very respectfully, your obedient servant,

NELSON A. MILES,
Major-General, Commanding.

The ADJUTANT-GENERAL U. S. ARMY,
Washington D. C.

HEADQUARTERS DEPARTMENT OF THE MISSOURI,
Chicago, Ill., January 26, 1893.

SIR: I have the honor to submit the following report of my duties, in compliance with letter from the Adjutant-General of the Army, dated August 11, 1892, in response to request of Director-General Davis, dated July 16, 1891, designating me to command such of the regular troops and the National Guard of the several States as might be assembled in Chicago to take part in the dedication of the buildings of the World's Columbian Exposition on October 12 (changed to October 21), 1892.

Brig. Gen. Eugene A. Carr and Maj. Amos S. Kimball were ordered to report to me for duty in connection with the exercises. Maj. Kimball reported August 8, and was directed to make all the necessary arrangements for transporting the troops, for quartering them in the Exposition buildings at Jackson Park, and for supplying them while there. Gen. Carr reported to me an October 17, and was directed to proceed to Jackson Park and assume command of all the United States troops ordered there, and to exercise general supervision of all other troops reporting there. The United States troops ordered to take part were as follows:

Twenty-four companies of infantry, composed of: Headquarters and Companies E, Twelfth; H, Seventh; F, Tenth, and F, Thirteenth Infan-

try; band and battalion, Nineteenth Infantry; the Fifteenth Regiment; headquarters, band, and battalion, Third Infantry, and headquarters, band, and battalion of the Second Infantry—aggregating 1,399 officers and men.

Ten troops of cavalry, composed of: Headquarters, band and Troops C and D, Fifth Cavalry; Troops B and K, Seventh Cavalry; L, Third Cavalry; band and Troops F, G, and L, Sixth Cavalry, and Troops A and F, Ninth Cavalry—aggregating 625 officers and men.

Four light batteries of artillery, composed of: Light Batteries E, First; A and F, Second; and F, Fourth Artillery—aggregating 235 officers and men.

Battalion of marines—aggregating 215 officers and men.

Total number of United States troops and marines, 2,474 officers and men.

The following National Guard organizations were also sent by their respective States and were under the command of the governors of their respective States and the officers designated by them:

Three regiments from Indiana, with a total of 988 officers and men; one regiment from Missouri, with a total of 522 officers and men; two regiments from Iowa, with a total of 2,030 officers and men; two regiments from Wisconsin, with a total of 1,045 officers and men; three regiments from Minnesota, with a total of 1,536 officers and men; two regiments from Ohio, with a total of 1,458 officers and men: one regiment from Michigan, with a total of 724 officers and men; six regiments from Illinois, with a total of 3,763 officers and men; two troops Illinois Cavalry, with a total of 100 officers and men; two batteries Illinois Artillery, with a total of 105 officers and men. Total number of State troops, 12,271 officers and men.

These troops, both United States and State (except the First and Second Illinois regiments living in Chicago), were quartered in the Exposition buildings, being assigned to their respective positions therein by Maj. Kimball. The United States troops were subsisted by the commissary department at a cost of 57 cents per day per man.

On October 19, at 4 p. m., the light artillery was drilled at Washington Park, under the supervision of Maj. E. B. Williston, Third Artillery, inspector of artillery at these headquarters, in the presence of several thousand people. Rodney's Battery (F of the Fourth) and Woodruff's Battery (F of the Second), were first each drilled separately by their respective captains. The entire battalion, four batteries, was then drilled by Maj. Randolph, Third Artillery. After the completion of the artillery drill the cavalry was drilled on the same ground by Col. James F. Wade, Fifth Cavalry.

The 20th of October was devoted to a civic parade in which the military were not expected to participate.

The programme for October 21, as arranged by the joint committee on ceremonies, was as follows: The distinguished guests and officials were to be conducted by an escort of honor composed of all the mounted troops from the Lake Front Park to Washington Park. At Washington Park a review of the infantry troops by the Vice-President. Appropriate salutes were also to be fired at stated intervals. The Vice-President, guests, and officials were then to proceed to the building of Manufactures and Liberal Arts, where the oratorical, literary, and musical exercises of the dedication were to take place.

In order to properly carry out this plan, General Orders, No. 10, * * * were issued October 18. * * * A considerable number of

troops, both United States and State, were directed in this order to take positions in the manufactures building and at other points designated. This was in accordance with the request of the World's Fair officials, and rendered necessary by the immense concourse of people that were to be assembled there, and the long line of march to be protected. An official of the World's Fair management called for 1,000 men in the building alone to preserve order and afford protection to the 120,000 people that were to occupy the building; in fact, it was estimated that there were 140,000 people within its walls at one time.

The importance of moving the procession, comprising the representatives of all the States and Territories of our own country and of all the governments of the world, from the central part of the city through the principal avenues, boulevard, and park to the Exposition grounds in time for carrying out the programme of the dedication in the manufactures building was repeatedly and urgently impressed upon me by the World's Fair management.

The officials and distinguished guests, mounted and in carriages, left the Lake Front Park at 9 o'clock, moving south on Michigan avenue, conducted by the following mounted escort, under command of Col. James F. Wade, Fifth Cavalry: Troops C, D, and band, Fifth Cavalry; Troop L, Third Cavalry; Troop L and band, Sixth Cavalry; Troops B and K, Seventh Cavalry; Troops A and F, Ninth Cavalry; Light Batteries E, First, A and F, Second Artillery; Troops A and B, Illinois National Guard, and Battery D, Illinois National Guard.

After moving 2⅜ miles to the corner of Michigan avenue and Twenty-ninth street, Hon. Levi P. Morton, Vice-President of the United States, accompanied by President Palmer, President Higinbotham, Director-General Davis, and other officials of the Exposition, were received with due honors. The procession then continued its march south on Michigan avenue, Thirty-fifth street, and the Grand Boulevard to Washington Park, 3½ miles distant, where the infantry troops had been formed in three brigades in line of masses, and where the Vice-President took his position at 10:30 o'clock. The Vice-President reviewed the troops from his carriage, which, for that purpose, was placed 75 yards in advance of the line of the other carriages, his position being marked by a large American flag, conspicuously displayed from another carriage just to the right of the Vice-President.

Owing to the limited time the "present" in line and the ride around the line were dispensed with in accordance with paragraph 685, Infantry Drill Regulations, U. S. Army.

The troops were put in motion to pass in review at 10:45 a. m., and the rear of the column passed the reviewing point at 11:40 a. m. The column then became the escort of the procession, conducting it through Washington Park, via Midway Plaisance and the Exposition grounds, to the manufactures building, where 120,000 people had assembled to witness the ceremony. The entire distance marched from Lake Front Park to the manufactures building in Jackson Park was 8⅞ miles.

Salutes were fired as follows: The salute of the Speaker of the House of Representatives was fired by Woodruff's battery on Lake Front Park at 9 o'clock, when the procession first moved. The Vice-President's salute was fired by Rodney's battery in Washington Park on the arrival of the Vice-President at the south open green in Washington Park. The national salute was fired by Rodney's battery in Jackson Park as the head of the procession entered the park, and also by the U. S. S. *Michigan*, commanded by Commander Wingate, U. S. Navy.

The U. S. Marine Corps and band took a prominent part in the parade, and also did good service in connection with the troops in furnishing guards and escorts, and the Marine Band, together with the band of the Mexican Republic, sent by President Diaz, played national airs prior to the dedication ceremonies.

All of the troops presented a fine appearance; were well equipped; marched and maneuvered with commendable skill and accuracy, and executed all that was required of them by the committee on ceremonies and the officials appointed to give general directions, with the single exception of one officer. Unfortunately this peaceful celebration was not an exception to the history of military campaigns and battles where heroism, devotion to duty, and honorable service is the general rule, where almost invariably some one, when least expected, fails in the discharge of his duty. It rarely happens, however, as in this case, that it is done deliberately and for a purpose; but I am glad to say that it occurred in only one instance, and by only one officer, to my knowledge.

On October 22 the beautiful and interesting ceremonies of dedicating the State buildings were conducted by many of the governors of the respective States and the distinguished representatives from the States, in which the state troops in many instances took part.

The United States troops returned to their various stations on October 22, in accordance with instructions from Headquarters of the Army, and the state troops also returned to their proper stations on that day.

The programme for the three days' celebration was executed in every particular as arranged and directed by the joint committee on ceremonies and the council of administration. The dedication of this great enterprise, was, celebrated in an imposing and dignified manner befitting the magnitude of such an important historical event.

Very respectfully, your obedient servant,

NELSON A. MILES,
Major-General, Commanding.

The ADJUTANT-GENERAL U. S. ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. THOMAS H. RUGER.

HEADQUARTERS DEPARTMENT OF CALIFORNIA,
San Francisco, Cal., August 25, 1893.

SIR: I have the honor to submit the following report of operations and the condition of affairs in the Department of California since the annual report of September 8 last.

Under the provisions of General Orders, No. 54, Headquarters of the Army, July 1, 1893, that part of the State of California lying south of the thirty-fifth parallel has been added to the Department of California. This change, by which the sea coast of California is placed within one Department, was especially desirable in view of conditions that may occur.

Pursuant to instructions of the Major-General Commanding the Army, dated April 6, 1893, Troop I, Fourth Cavalry, Capt. Abram E. Wood, left the Presidio of San Francisco on May 9 last for the Yosemite National Park, and arrived there on May 24, for the purpose of protecting the park, under the rules prescribed by the Secretary of

the Interior against trespass; and Troop B, Fourth Cavalry, Capt. James Parker, left the Presidio of San Francisco on June 6 last for the performance of similar duty with reference to the Sequoia National Park, and arrived at the limits of the park on the 20th of that month. These troops have since continued in efficient performance of the duties stated.

Troop K, Fourth Cavalry, Capt. Joseph H. Dorst, left the Presidio of San Francisco on the 2d instant for a month's field instruction.

Light Batteries D and F, Fifth Artillery, will start on a practice march in September, and during their absence from the Presidio will have their annual practice firing.

Owing to the limited amount of wagon transportation available in the Department, and the needs of the troops in the national parks, it will not be practicable the present season to send all the garrisons in the department away from their stations for field instruction.

The instruction in general had at the posts, theoretically and practically, during the past year, has been satisfactory within the limits fixed by existing circumstances.

A statement indicating in general the operation of the lyceums at the different posts is attached hereto, marked exhibit A.*

The target practice for this year with seacoast guns by the batteries of the Fifth Artillery stationed at the Presidio of San Francisco, Alcatraz Island, and Fort Mason has been finished. The results show a decided improvement over last year's practice, and also superiority, comparatively, to the practice had elsewhere in recent years as presented in the published reports.

The general state as to discipline during the year has been good. For the year ending June 30, 1893, there was a decrease of about 20 per cent in the number of desertions relative to total strength as compared with the per cent for the year ending June 30, 1892. The percentage of trials by courts-martial was also less than for the year ending June 30, 1892.

Within the past two years, the past year particularly, a decided improvement has been made in the armament of the defenses of San Francisco Harbor, by the substitution of the improved for old pattern carriages for seacoast guns, by which means the highest charges allowable for the guns may be used, and also by the mounting of additional guns of patterns effective for defense. Good progress has been made by the Corps of Engineers in preparation for soon placing high-power guns of recent models.

The reports called for by General Orders, No. 29, Adjutant-General's Office, 1892, to be submitted at the close of the course of practical instruction and required for the present year, embracing recommendations thought advisable in the Drill Regulations, will be forwarded at the end of the season.

The report of target practice in small-arms firing, not attached hereto, will be forwarded at the close of the target-practice season.

For particulars of administration in the staff departments and recommendations by their chiefs on duty at department headquarters, attention is requested to the reports transmitted herewith, as follows:

Col. Oliver D. Greene assistant adjutant-general.

Col. Joseph R. Smith, medical director.

Col. John G. Chandler, chief quartermaster.

Lieut. Col. George A. Burton, inspector-general.

Lieut. Col. Edward Moale, Third Infantry, inspector of small-arms practice.

---

*Omitted.

Maj. Charles I. Wilson, chief paymaster.
Maj. John I. Rodgers, First Artillery, inspector of artillery.
Maj. Edward Hunter, judge-advocate.
Maj. Charles P. Eagan, chief commissary of subsistance, and of
Second Lieut. Charles G. Lyman, Second Cavalry, aid-de-camp, in charge of engineer and signal offices.

I am, sir, very respectfully, your obedient servant,

THOMAS H. RUGER,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL, U. S. ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. WESLEY MERRITT.

HEADQUARTERS DEPARTMENT OF DAKOTA,
St. Paul, Minn., August 28, 1893.

SIR: I have the honor to submit a report of military affairs in the Department of Dakota, from August 1, 1892, to June 30, 1893, inclusive.

The following is a record of events for the year:

August 1, 1892.—Troop L, Eighth Cavalry, "Casey's Scouts," First Lieut. William D. McAnaney, commanding, left camp at Tongue River Agency, Mont., en route to its station, Fort Keogh, Mont. Walks Nights, a Northern Cheyenne Indian, who had been under military surveillance near Fort Keogh with troop L, Eighth Cavalry, since January 15, 1892, left the custody of Lieut. McAnaney August 2, while the above-named troop was returning to Fort Keogh, and has not since returned. The troop arrived at Fort Keogh, Mont., August 6. Distance marched, about 90 miles.

August 17, 1892.—Troop L, Third Cavalry, Second Lieut. J. C. Byron, Eighth Cavalry, commanding, left Fort Meade for a thirty days' practice march, and proceeded to the Cheyenne River Indian Agency. Arrived at Forest City, S. Dak., August 25, and went into camp at that point. Distance marched, 190 miles.

August 25, 1892.—Company H, Twenty-second Infantry, Capt. H. H. Ketchum, commanding, left Fort Keogh, en route to Camp Merritt, near Tongue River Agency, Mont., for a tour of duty there, and to relieve company C, Twenty-second Infantry, from duty at that camp. Arrived August 31. Distance marched, about 90 miles.

September 1, 1892.—Company C, Twenty-second Infantry, Capt. P. M. Thorne, commanding, upon being relieved by company H, Twenty-second Infantry, left Camp Merritt, near Tongue River Agency, Mont., and returned to its station, Fort Keogh, Mont. Arrived September 6. Distance marched, 95 miles.

September 5, 1892.—Companies B, E, and G, Twentieth Infantry, Capt. A. A. Harbach, commanding, left Fort Assinniboine and proceeded to camp of instruction on Beaver Creek, Montana. Returned to post September 14. Distance marched, 36 miles.

September 12, 1892.—Troop H, Tenth Cavalry, Maj. T. J. Wint, commanding, left Fort Buford, N. Dak., on a practice march and proceeded to Sun Lake, Montana. Returned to post September 21. Distance marched, 110 miles.

September 12, 1892.—Company I, Twenty-second Infantry, Second Lieut. William H. Wassell, commanding, left Fort Yates, N. Dak., and proceeded on a tour of recruiting duty for the company, visiting points

on the Grand River and Rock Creek, North Dakota. Returned to post September 24. Distance marched, 109 miles.

September 12, 1892.—Companies B, C, and E, Twenty-fifth Infantry, Lieut. Col. John N. Andrews, commanding, left Fort Buford, N. Dak., on a practice march and proceeded to Jones Creek, North Dakota. Returned to post September 21. Distance marched, about 105 miles.

September 14, 1892.—Troop D, Tenth Cavalry, Capt. A. S. B. Keyes, commanding, left Fort Keogh and proceeded on a practice march to Fort Custer, Mont. Left latter post September 30, en route to proper station, and encamped on Little Big Horn River. Distance marched, 160 miles.

September 14, 1892.—Troop L, Third Cavalry, Second Lieut. J. C. Byron, Eighth Cavalry, commanding, returned to station, Fort Meade, from a practice march to Forest City, S. Dak. Distance marched, 380 miles.

September 16, 1892.—Troops C and F, Tenth Cavalry, Maj. M. Moylan, commanding, left Fort Assinniboine and proceeded to Camp of Instruction on Beaver Creek, Montana. Returned to post September 25. Distance marched, 36 miles.

September 17, 1892.—Troops A, B, D, E, I, and K, Eighth Cavalry, Maj. A. B. Wells, commanding, left Fort Meade and proceeded on a practice march to Belle Fourche, S. Dak. Returned to post September 25. Distance marched, 101 miles.

September 17, 1892.—Companies A, D, F, and H, Twentieth Infantry, Capt. J. N. Coe, commanding, left Fort Assinniboine and proceeded to the Camp of Instruction on Beaver Creek, Montana. Returned to post September 25. Distance marched, 36 miles.

September 20, 1892.—Headquarters and Companies A, B, C, D, E, F, G, and H, Third Infantry, Col. E. C. Mason, commanding, left Fort Snelling and proceeded on a practice march to Lake Minnetonka, Minnesota. Returned to post September 29. Distance marched, 45½ miles.

September 25, 1892.—Company I, Third Infantry, First Lieut. John H. Beacom, commanding, left Fort Sully and proceeded on a practice march to the Little Bend of the Missouri River. Returned to post September 29. Distance marched, 36 miles.

October 8, 1892.—Troop D, Tenth Cavalry, Capt. A. S. B. Keyes, commanding, returned to station, Fort Keogh, from a practice march to Fort Custer, Mont. Distance marched, 150 miles.

October 11, 1892.—Troop D, Sixth Cavalry, Capt. G. L. Scott, commanding, arrived at Fort Yellowstone from camp on Lower Geyser Basin, Yellowstone National Park, Wyoming, and took station at the post. This troop is designated to remain in the park during the winter and until further orders. Distance marched, about 40 miles.

October 11, 1892.—Troop C, Eighth Cavalry, Capt. J. B. Hickey, commanding, left Fort Meade, S. Dak., on a practice march and returned to post October 12. Distance marched, 42 miles.

October 15, 1892.—Troop L, Third Cavalry, Second Lieut. J. C. Byron, Eighth Cavalry, commanding, left Fort Meade, S. Dak., and proceeded to Chicago, Ill., to participate in the military ceremonies connected with the dedication of the World's Columbian Exposition. Returned to post October 25. Distance traveled, about 1,950 miles.

October 18, 1892.—Headquarters and Companies A, E, G, and H, Third Infantry, Col. E. C. Mason, commanding, left Fort Snelling, Minn., and proceeded to Chicago, Ill., to participate in the military ceremonies connected with the dedication of the World's Columbian Exposition. Returned to post October 23. Distance traveled, 924 miles.

October 20, 1892.—Troop E, Eighth Cavalry, Capt. H. F. Kendall, commanding, left Fort Meade, S. Dak., on a practice march, and returned to post October 22. Distance marched, 51½ miles.

October 23, 1892.—Troop D, Eighth Cavalry, Capt. E. A. Godwin, commanding, left Fort Meade S. Dak., on a practice march, and returned to post October 25. Distance marched, 46 miles.

October 27, 1892.—Troop I, Eighth Cavalry, Capt. A. G. Hennisee, commanding, left Fort Meade, S. Dak., on a practice march, and returned to post October 29. Distance marched, 40 miles.

November 2, 1892.—Troop B, Eighth Cavalry, Capt. E. Luff, commanding, left Fort Meade, S. Dak., on a practice march, and returned to post November 4. Distance marched, 44 miles.

November 12, 1892.—Troop K, Eighth Cavalry, First Lieut. R. J. Duff, commanding, left Fort Meade, S. Dak., on a practice march, and returned to post November 14. Distance marched, 56 miles.

November 14, 1892.—Troop L, First Cavalry, Second Lieut. William H. Osborne, commanding, left Fort Custer on a twenty days' practice march to the Big Horn Mountains, Montana.

November 18, 1892.—Troop A, Eighth Cavalry, Capt. Q. O'M. Gillmore, commanding, left Fort Meade, S. Dak., on a practice march, and returned to post November 19. Distance marched, 17 miles.

November 20, 1892.—Barracks No. 21, at Fort Custer, Mont., occupied by troops B and G, Tenth Cavalry, was destroyed by fire.

November 24, 1892.—Company A, Twenty-fifth Infantry, Capt. J. C. Ord commanding, left Fort Custer, Mont., and proceeded to Camp Merritt near the Tongue River Agency, Mont., for temporary duty at the agency, and to relieve Company H, Twenty-second Infantry, from duty at that point. Arrived November 28. Distance marched, 55 miles.

November 29, 1892.—Company H, Twenty-second Infantry, Capt. H. H. Ketchum commanding, on being relieved by Company A, Twenty-fifth Infantry, left Camp Merritt, Mont., and returned to its proper station, Fort Keogh, Mont. Arrived December 3. Distance marched, 90 miles.

December 3, 1892.—Troop D, Tenth Cavalry, Capt. George H. Evans commanding, left Fort Keogh, Mont., and proceeded to Fort Buford, N. Dak., there to take station. Arrived December 16. Distance marched, 160 miles.

December 8, 1892.—Troop L, Eighth Cavalry, Second Lieut. F. C. Marshall, Eighth Cavalry, commanding, left Fort Keogh for Tongue River Agency, Mont., for the purpose of recruiting. Returned to station December 31, with 26 recruits. Distance marched, 190 miles.

December 8, 1892.—Troop L, First Cavalry, under command of Second Lieut. W. H. Osborne, returned to Fort Custer from practice march. Distance marched, 150 miles.

December 24, 1892.—Troop A, Tenth Cavalry, Capt. C. L. Cooper commanding, left Fort Custer, Mont., and proceeded to Fort Keogh, Mont., to take station. Arrived December 29. Distance marched, 135 miles.

January 20, 1893.—Company I, Third Infantry, First Lieut. J. H. Beacom commanding, left Fort Sully, S. Dak., for station at Fort Snelling, Minn. Arrived there January 21. Distance traveled, 445 miles.

March 26, 1893.—Company D, Twenty-fifth Infantry, Capt. O. J. Sweet commanding, left Fort Custer en route for Camp Merritt for a tour of temporary duty at that camp. Arrived April 1. Distance marched, 60 miles.

April 2, 1893.—Upon being relieved by Company D, Company A,

Twenty-fifth Infantry, Capt. J. C. Ord commanding, left Camp Merritt, en route to station, Fort Custer, Mont., arriving there April 4. Distance marched, 60 miles.

June 8, 1893.—Companies C and F, Third Infantry, Capt. F. W. Roe commanding, left Fort Snelling, Minn., and proceeded by rail to Chicago, Ill., for duty in connection with the War Department Exhibit at the World's Fair. Arrived there June 9. Distance traveled, 417 miles.

June 13, 1893.—Company D, Third Infantry, First Lieut. F. B. McCoy commanding, left Fort Snelling, Minn., en route to the Leech Lake Indian Reservation, arriving there June 15. On the 11th instant, Dr. Walker, overseer and agency physician, attempted to seize some whisky from Oshebegenish, an Indian. An altercation ensued during which the doctor shot, accidentally as he claims, the Indian in the face. Oshebegenish being unarmed at the time, the Indians considered the shooting unprovoked, and on the same evening they surrounded the doctor's house, threatening to kill him and burn him out. This threat, it is thought, would have been executed except for the efforts of two or three Indians who remained faithful and baffled the attempts of the rioters at the door. With the arrival of the troops the excitement subsided. Dr. Walker was arrested by the deputy United States marshal and turned over to the troops for safe-keeping until June 22, when he was removed to St. Paul. The command left Leech Lake June 27, and returned via Park Rapids to Fort Snelling, Minn., where they arrived June 28. Distance traveled, 470 miles.

June 18, 1893.—Troop D, Eighth Cavalry, Capt. E. A. Godwin commanding, left Fort Meade, S. Dak., en route to Fort Leavenworth, Kans., there to take station.

June 19, 1893.—Second Lieut. F. C. Marshall, with 16 men of Troop L, Eighth Cavalry, left Fort Keogh, Mont., and proceeded to Lame Deer, Mont., where, it was reported, the Northern Cheyennes were in a state of great excitement over the arrest of an Indian soldier belonging to Troop L, Eighth Cavalry, who at the time was absent without leave from Fort Keogh. Upon arrival, June 20, it was found that the arrest had been made by the Indian police and that everything was quiet. Returned to Fort Keogh June 24. Distance marched, 180 miles.

With the foregoing record of events for the past year, and the comprehensive reports of the able officers of the different staff departments on duty at these headquarters which follow, a more extended paper on my part is not necessary.

The discipline of the troops is excellent; the capacity and disposition of the officers for duty, as a general rule, have never been better.

If a reasonable expenditure for the improvement of the conditions at the different posts in this department in modernizing the water supply and giving bathing facilities for officers is excepted, and increased funds for repairs and new buildings are supplied, there is little to be desired.

To these matters I have called attention in special reports in the past, and will continue to do so in the future, as the surest means of reaching a favorable conclusion to ameliorate long-endured, though unnecessary, inconveniences and privations on the part of officers doing duty on the frontier.

Very respectfully,

WESLEY MERRITT,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL, U. S. ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. JOHN R. BROOKE.

HEADQUARTERS DEPARTMENT OF THE PLATTE,
Omaha, Nebr., August 10, 1893.

SIR: In compliance with instructions from Headquarters of the Army, dated July 15, 1893, I have the honor to make my annual report, as follows:

The number of troops in this department remains about the same as at date of my last annual report. One troop of the Sixth Cavalry was ordered to Fort Leavenworth, and one troop of the Ninth Cavalry, relieved from that post, joined its regiment in this department. The State of Colorado and the Territory of Utah were removed from this department July 1, under General Orders No. 54, current series, Headquarters of the Army, and now constitute a part of the Department of the Colorado, thus reducing the force in this department by headquarters and six companies of the Seventh Infantry, Fort Logan, Colo.; two troops of the Ninth Cavalry, Fort Du Chesne, Utah Territory, and the whole of the Sixteenth Infantry, which constitutes the garrison at Fort Douglas, Utah.

The practice marches held in this department subsequent to the date of my last annual report were general, and reports show benefit to the troops engaged.

Only minor changes of station of troops have been made. Troop H, Sixth Cavalry, was transferred from Fort McKinney, Wyo., to Fort Niobrara, Nebr.; Troop F, Sixth Cavalry, from Fort Niobrara, Nebr., to Fort Leavenworth, Kans., Department of the Missouri; Troop C, Ninth Cavalry, from Fort Leavenworth, Department of the Missouri, to Fort McKinney, Wyo. On account of the contemplated abandonment of Fort Randall, S. Dak., Company F, Twenty-first Infantry, left that post October 1, 1892, for Fort Sidney, Nebr. Fort Randall was abandoned pursuant to letter from Headquarters of the Army, Adjutant-General's Office, Washington, D. C., dated October 31, 1892, Company I, Twenty-first Infantry, leaving there December 7, 1892, for Fort Sidney, Nebr. Fort Randall, S. Dak., is now in the custody of the Quartermaster's Department. Company D, Twenty-first Infantry, was relieved from duty at Fort Du Chesne, Utah, September 12, 1892, and proceeded to and took station at Fort Sidney, Nebr., arriving there September 26, 1892. The band and troops F, G, and L, Sixth Cavalry, at Fort Niobrara, Nebr., were ordered to take part in the dedicatory exercises at the World's Fair, Chicago, Ill. They left their post October 15 and returned October 24, 1892. Troops A and F, Ninth Cavalry, left Fort Robinson, Nebr., October 15, for the same purpose and returned October 25, 1892. The headquarters, band, and four companies of the Second Infantry also attended these exercises, leaving Fort Omaha, Nebr., October 18 and returning October 23, 1892. The troops of the Sixth and Ninth Cavalry, which were stationed in Wyoming during the summer and autumn, of last year, were returned to their posts, headquarters, band, and four troops of the Ninth Cavalry reaching Fort Robinson, Nebr., September 27, 1892, and headquarters, band, and four troops of the Sixth Cavalry reaching Fort Niobrara, Nebr., September 28, 1892. On November 13 troops D

and E, Ninth Cavalry, were relieved from duty in the field and returned to Fort Robinson, Nebr., on the 15th of the same month. Troops A and K, Sixth Cavalry, relieved November 13, reached Fort Niobrara, Nebr., November 15, 1892.

During the early spring there were some manifestations of a bad spirit amongst certain Indians at Pine Ridge Agency, S. Dak. The agent, however, with the aid of his Indian police and other well-disposed Indians, was able to subdue these manifestations very effectually.

Instruction in military signaling was held during the months of October and November at all posts in the department, this instruction being continued until Army Regulation 1761 was fully complied with.

The results of this season's rifle, carbine, and pistol practice have not yet been obtained, and will constitute, together with the reports of the annual competitions, a special report, which will be rendered as soon as the various reports are received, tabulated, and arranged. I would renew my recommendations of last year in regard to rifle practice.

As regards the post-exchange system, I would say that another year's experience has shown it to be a necessary and valuable institution.

The acting judge-advocate's report shows a decrease of trials by courts-martial over those of the preceding year, due largely, I think, to the application of instructions hitherto received from Headquarters of the Army. The authority of company and other commanders should be still further augmented, so that minor disciplinary measures might receive the authority of law. Certainly discipline can be more assured by this means than by the resort to the summary or other courts.

The inspection of posts in the department has but now been commenced. Upon its completion at each post reports will be forwarded as usual.

The instruction in drill regulations, target practice, and the schools for the enlisted men have, according to the reports received, progressed satisfactorily at all posts.

The officers' lyceum was continued throughout the prescribed time during the past year, and attention is invited to the synopsis of the reports from post commanders.

I invite attention to the accompanying reports of various staff officers at these headquarters, by which will be seen in detail the operations of their various departments during the year, particular attention being invited to the reports of the medical director and chief ordnance officer of the department.

The sanitary condition spoken of a year ago as regards Forts Logan and Douglas still calls for attention. A project for the improvement of water supply and sewerage at Fort Douglas was under way when that post was transferred to the Department of the Colorado. The work is still progressing, and a report will in due time be forwarded.

As regards the Indian troops and companies enlisted in this department I would invite attention to the accompanying reports of the officers commanding them, and the extracts relating thereto by the commanding officers of the posts at which they are stationed. The principal difficulty seems to be that the Indians do not speak English. From my knowledge of the race I do not think it proceeds from any other than a natural dread of ridicule on account of mistakes made in

their attempts to speak our language, the Indian being peculiarly sensitive to ridicule. The experiment is receiving the attention of all connected with it; its ultimate success now depends largely upon the Indian soldiers themselves.

The officers attached to these headquarters have performed their various duties with zeal and ability.

Very respectfully, your obedient servent,

JOHN R. BROOKE,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL U. S. ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. A. McD. McCOOK.

HEADQUARTERS DEPARTMENT OF THE COLORADO,
Denver, Colo., September 1, 1893.

SIR: I have the honor to submit the annual report of the Department of the Colorado.

The Department of the Colorado was established by direction of the President, in General Orders No. 54, Headquarters of the Army, Adjutant-General's Office, Washington, July 1, 1893, to consist of the State of Colorado and the Territories of New Mexico, Arizona, and Utah, with the headquarters at Denver, Colo. Paragraph 3, same order, abolished the Department of Arizona.

I assumed command of the Department of the Colorado July 6, 1893, and upon the 11th of the same month proceeded to Denver, Colo., and upon the 14th of July established the headquarters of the department in Denver.

Our offices are now established in a fireproof building known as the "Equitable," corner of Seventeenth and Stout streets.

The department, including the Territories of Arizona, New Mexico, Utah, and the State of Colorado, contains an area of 424,495 square miles. Of this there are 33,863 square miles of Indian reservations.

There is a population of 822,026 white and 40,784 Indians within these limits.

There are thirteen military posts in the present department: Fort Apache, Fort Bowie, Fort Grant, Fort Huachuca, San Carlos, and Whipple Barracks in Arizona; in New Mexico, Fort Bayard, Fort Marcy (Santa Fe), Fort Stanton, and Fort Wingate; in Utah, Fort Du Chesne and Fort Douglas, and in Colorado, Fort Logan.

FORT APACHE.

Fort Apache is located in the northern portion of the White Mountain Reservation; is also a sub-agency for the Coyotero and White Mountain Apaches. This post is on White Mountain Creek, 97 miles south from Holbrook, a station upon the Atlantic and Pacific Railroad. The country surrounding this post is beautifully picturesque, but during the winter months is almost inaccessible on account of bad roads, which, though leading over an elevated country, during these months are muddy and boggy in places.

The present garrison consists of a troop of the First Cavalry and two companies of the Eleventh Infantry.

The White Mountain Apaches have nothing in common with the San Carlos Indians. The country they inhabit is separated from the latter Indians by high ranges of mountains. These Indians are very nearly self-supporting, whilst the San Carlos tribes are not; hence, under these conditions and circumstances, it is earnestly recommended that the White Mountain Apaches be separated for administrative purposes from the San Carlos tribes, having for their agent the commanding officer of the post. Repeated recommendations have been made to this effect while I was commanding the former department of Arizona. One of the objections made was that there were no funds available from the Indian appropriation. This objection is not tenable now, as an officer of the Army can perform the duty of agent. It is inconvenient and unfair for the agent at San Carlos to be responsible for the property pertaining to the sub-agency at Fort Apache.

FORT BOWIE.

Fort Bowie is located on the northwest spur of the Chiricahua Mountains, 14 miles south of Bowie Station, on the Southern Pacific Railroad. During the late Apache wars it was an important point to hold on account of its geographical location and of the springs of water from which the station is supplied. During times of peace, as now enjoyed by the Territory of Arizona, Bowie as a military post ceases to be of such military importance, and can now be abandoned, when proper shelter can be provided for its garrison at other posts in the department. The present garrison consists of two troops of cavalry.

FORT GRANT.

So long as the Apaches, Yumas, Mojaves, and Tontos are concentrated in and about San Carlos, Fort Grant will continue to be an important military post. It is now garrisoned by the headquarters and five troops of the First Cavalry.

FORT HUACHUCA.

This post is 14 miles north of the boundary between Mexico and the United States, and 9 miles from a station on the Sonora and Guaymas Railroad. The present garrison of this post consists of two troops of the Second Cavalry and four companies of the Twenty-fourth Infantry. It is an important post and should be maintained.

SAN CARLOS.

This is the only post in the department where the temperature is extreme. It is situated on the Gila River, 106 miles from Wilcox, on the Southern Pacific Railroad. The heat in summer is intense and continuous, averaging 110 degrees during June, July, and August. Fortunately the troops here are considered in the field, their tour of duty being limited. The officers are sheltered in small but comfortable adobe houses, but the enlisted men remain in their canvas sheds, and are most uncomfortable.

It is understood that efforts will be made to remove these Indians from this desolate country and place them in a more favorable location as regards temperature and lands.

If the troops are to be kept at San Carlos, common humanity demands they should be sheltered by adobe walls and double roofs to alleviate their misery.

WHIPPLE BARRACKS.

If this post is to be retained it should, so far as the barracks and some of the officers' quarters are concerned, be rebuilt. A well-built and well-managed railroad connects this place with Ash Fork, a station of the Atlantic and Pacific Railroad. It is understood that this road is to be continued to completion until it reaches Phœnix, the capital of the Territory of Arizona. When this portion of the road is completed it will place Whipple Barracks in connection with the rich and productive valley of Salt River, which will materially reduce the expense of living there and the maintenance of the post.

FORT BAYARD.

This post is situated at the southern base of the Black Range Mountains, 55 miles northwest from Deming, on the Southern Pacific and Santa Fe railroads. The location is 9 miles from Silver City and 3 miles from a new railroad lately completed. The garrison consists of headquarters and four companies of the twenty-fourth Infantry and two troops of the First Cavalry.

FORT STANTON.

This post, established in 1854, is located in a picturesque country on the banks of the Bonita Creek, 100 miles east of Carthage, N. Mex. This post should be continued until the Mescalero Apaches become more familiar with the ways of civilization. The garrison consists of two companies of the Tenth Infantry.

FORT WINGATE.

The importance of this post increases each year on account of its location near the southern boundary of the Navajo Reservation in New Mexico. It should be enlarged to a regimental post. The old quartermaster's storehouse at this place is a disgrace to the department—old, leaky, dirty, and too dark for comfortable occupancy. It is impossible to keep the quartermaster stores in anything like proper condition. The greatest inconvenience is encountered in taking inventories of the property piled in this den. A good and commodious storehouse can be built here with small outlay.

The ground is favorable for the enlargement of this post, and the water supply is of good quality and abundant. The present garrison consists of the headquarters and six troops of the Second Cavalry.

FORT MARCY.

This post is within the city limits of Santa Fé, N. Mex. The present garrison is composed of the headquarters and two companies of the Tenth Infantry. If this post is to be continued there should be new barracks for men and quarters for the officers built as soon as possible.

FORT LOGAN.

This post is located 10 miles south of the city of Denver, on the Denver and Rio Grande Railroad. The buildings are new and comfortable. It should be enlarged to a regimental post by the construction of two additional barracks for enlisted men and quarters for officers.

FORT DUCHESNE.

This post is located in the northeast portion of the Territory of Utah, upon the Uintah River, 88 miles north of Price Station, on the Rio Grande and Western Railroad. It is now garrisoned by two troops of the Ninth Cavalry.

FORT DOUGLAS

Is a regimental post located near the foot-hills of the Wasatch range of mountains, on a plateau 700 feet above the valley of the great Salt Lake and 3 miles east of Salt Lake City.

INDIAN TROOPS.

There are three organizations of Indian troops on duty in this department—one troop of the Second Cavalry (Navajo) at Fort Wingate, N. Mex.; one company of the Eleventh Infantry at Fort Apache, Ariz., and one company of the Sixteenth Infantry at Fort Douglas, Utah.

The members of the company at Fort Apache seem discontented and are asking for their discharge, and as each individual member assigns good reasons for the same, these applications have thus far been approved by me, and in my judgment it would be well to disband the entire company and let them return to their families and small farms to make their own living. I have no personal knowledge of the condition of the company at Fort Douglas, Utah.

EDUCATION.

The education of the enlisted men of the department has, during the past year, been carried on with improvement upon the methods for securing attendance employed during the previous year. The greatest difficulty we have to contend with is the want of competent teachers. I renew my recommendations contained in the last annual report, that a sufficient number of competent teachers be enlisted as general service men, with the same pay and allowances as now prescribed by law for the latter.

THE LYCEUMS.

The lyceums have been conducted in accordance with the provisions of General Orders, No. 80, Adjutant-General's Office, series 1891, at all posts in the department except San Carlos, which has been excepted from the requirements owing to the transitory nature of its garrison, which has heretofore been changed at intervals of six months, and on account of the peculiar nature of the duties required at that station.

The period during which the lyceums were in session extended from October 1 to March 31, as directed by General Orders, No. 33, series 1891, from these headquarters.

Reports from the commanding officers of the different posts show that the course of study has been greatly varied.

The following are the subjects taken up and the posts at which they were entered upon: Military law (abridged), Forts Bayard, Grant, and Huachuca. Military law (unabridged), Forts Apache, Bayard, and Marcy. General Orders, No. 100, Adjutant-General's Office, series 1863, Fort Stanton. The Articles of the Geneva Convention, Fort Apache. Field engineering, etc., Forts Marcy, Bayard, and Whipple Barracks. Drill regulations, Fort Apache, Bayard, Bowie, Grant, Huachuca, Stanton, and Wingate; San Diego Barracks, Whipple Barracks. Minor tactics (Shaw), Forts Apache, Wingate, and San Diego Barracks. Infantry fire (Batchelor), Forts Marcy and Stanton, and San Diego Barracks. Army regulations, San Diego Barracks and Fort Stanton.

Essays were written and submitted to the department commander by all officers except Lieut. Col. Vanvalzah, Twenty-fourth Infantry, who was excused therefrom on the certificate of the post surgeon that he has not been well enough to write his essay, and recommending that he be excused from that duty.

From all posts it is reported, in substance, that the interest taken by officers has been commendable, and that the lyceum is a success, benefit being derived therefrom.

It will be noticed that at Fort Bowie but one subject—drill regulations—is reported, whilst other posts report at least two or three, and that at San Diego Barracks four subjects were recited upon.

The reports also show lack of uniformity in the course of study for the year, and unless this can be remedied it marks one of the most serious defects of the system.

General Orders, No. 33, series of 1891, from these headquarters, was intended to initiate a progressive course of study, certain studies therein named to be completed that year, and others to follow during the next session in regular sequence. This sequence has not been followed, but instead of it a number of posts have gone back over the same ground prescribed for last year's course. The difficulties arising from a change of personnel of the commands make a consecutive course inconvenient to follow, perhaps, but unless it is so established and firmly adhered to it is likely that each year will find the lyceums thrashing over old wheat, resulting in the entire omission of other studies intended to be taken up by them.

RECOMMENDATIONS.

Among the recommendations made by superintendents of lyceums are the following:

Col. Z. R. Bliss, Twenty-fourth Infantry, Fort Bayard, N. Mex.: I have no recommendation to make in regard to the lyceum. I believe it to be a good institution, and that the line officers especially will derive great benefit from it. Talking leads to carelessness of expression, while writing causes carefulness of thought, exactness in statement, and precision of record, and the tendency of the lyceum is undoubtedly for the general improvement of all concerned.

For the older officers, field officers, I think the writing of essays should be optional. Those who like to write and have anything to impart will be glad to read essays. To those who neither like to write nor have anything valuable to impart, it is disagreeable and productive of no good. Their habits are pretty well formed, and it is hard and perhaps unwise to attempt to change them.

Col. E. P. Pearson, Tenth Infantry, Fort Marcy, N. Mex.: It is my belief that the officers' lyceum is a success, inasmuch as it induces officers to read, study, and make researches upon matters relating to their profession. * * * I also renew the recommendation made in my report of the lyceum last year to the effect that some means be provided for the purchase of military works at reduced rates, as the limited demand for such works makes them necessarily expensive.

The foregoing remarks and recommendations are concurred in. Field officers are not required to be examined prior to further promotion, and being available as instructors their time is well occupied on that duty and they might well be excused from any compulsory writing of essays.

The books used in connection with the lyceum should, if possible, be furnished to officers at reduced rates to enable all to possess them without drawing too largely on their income.

The most important question, however, is that of a uniform course of study, covering all subjects in regular sequence. This should be prescribed for all posts, so that each and every subject required by the War Department to be studied should have its regular turn, otherwise, judging from past experience, the entire course may never be covered, whilst there will be a repetition of certain subjects, such as each post commander at the time may see fit to adopt, and, perhaps, as many different courses and as many varieties in the amount gone over in each as there may be different commanders.

It would certainly appear that there would be more learned and less variation from what the orders intend by establishing uniformity and requiring definitely a certain portion of the studies for each year until the course is completed at each post, at least in each department, than by the present unregulated system.

Though this plan may be objected to as disadvantageous to certain officers who have not had the benefit of the first portion of the studies required, which has been completed in a previous year's course, yet the officers so affected will naturally be the younger officers, who will have opportunity to go over the entire course long before they are liable to be called upon to be examined for promotion, whilst the older officers will, by this method, be enabled to complete the entire course before their examination. This action seems necessary to remedy what is apparently a weak point in the plan of operation as now instituted.

THE POST EXCHANGE.

The post exchange has proven a success at all posts in this department where proper accommodations were to be had for its management. At Forts Bayard and Wingate the post traders have held on, and at these posts the exchange has not been a success. At Fort Bayard the exchange is held in a miserable hovel, without any conveniences whatever for the business of the institution. Fort Wingate labors under similar difficulties. These are the largest posts in New Mexico, and would give different results if proper quarters could be furnished.

Having broken up seven military posts in this department the troops were sent to the remaining nine in Arizona and New Mexico, causing nearly every available space in quarters to be occupied, leaving no room at Bayard and Wingate for the exchange business. The exchange is not recognized as a military institution, hence no appropriations are made for its necessary buildings. If it be a private institution it has under the law no right to a place among the permanent buildings upon a Government reservation.

As the period for the discontinuance of post traders at Forts Bayard and Wingate is near at hand it is recommended that a proper price be paid these traders for the buildings now occupied by them and these structures be assigned to the post exchange for its use and convenience.

DISCIPLINE.

Devotion to duty has been the keynote of the commissioned officers and enlisted men of this department during the past year.

TARGET PRACTICE.

So far reports have been received that target practice has been faithfully carried out and that in the main there has been an increase in the figure of merit. The detailed report can not be made until the close of the target year.

DRILL AND INSTRUCTION.

The provisions of General Orders, No. 29, Headquarters of the Army, 1892, will be carried out, and before the end of the year all troops of the department will have had at least twenty days in camp, with the instruction contemplated.

The cavalry from the posts along the southern line of the department will go into camp at Fort Grant, Ariz. No expense to the Government will be incurred, as orders will be given to use only Government transportation, limited in every case to the field allowance only.

INDIAN DEPREDATIONS.

During the past year there were but two events occurring within the limits of this department that could be classed as Indian depredations.

On October 9, 1892, Florentio Mongarro, a teamster, was ambushed and shot by Indians, and two horses taken at the same time. This occurred near Moore's ranch, south of Fort Bowie, at about 4 p. m. on the date mentioned above. Pursuit was made by a detachment from Fort Bowie, under command of Lieut. W. H. Bean, Second Cavalry. The trail led into Mexico.

On December 8, 1892, a young man named Bud Taylor, at the time a member of a hunting party in the Animas Mountains, was killed. Report of this event was made by Capt. John Pitcher, First Cavalry, who pursued the depredators.

All the Indians holding homes in this department are quiet and peaceful. Some few disturbances have occurred upon the borders of the Navajo Reservation, but a prompt use of the troops from Fort Wingate prevented the émeute from spreading, and it is hoped that with constant watchfulness peace may be maintained within the limits of the department.

In the organization of the department of the Colorado, with headquarters at Denver, business of all kinds will be facilitated; on some of the mail routes from posts a gain in time of from eight to ten days will be made, and from the other posts in Arizona and New Mexico the period of travel will be shortened from two to five days, Denver being almost upon the main routes from these posts to Washington,

The Navajo Reservation lies in Arizona, New Mexico, and Utah, and much of the trading of this large tribe is done in Colorado. This territory is now under the control of one officer, who can better supervise and control this large band of Indians.

I again recommend that the military reservations of Fort Verde,

Ariz., and Fort Union, N. Mex., be transferred to the Department of the Interior, and opened for settlement.

Attention is invited to the reports of the acting assistant adjutant-general and the inspector-general of the department.

During the past year, the department staff have performed their duties well and to my entire satisfaction. My personal staff have performed their duties with industry and intelligence.

Very respectfully, your obedient servant,

A. McD. McCOOK,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL U. S. ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. FRANK WHEATON.

HEADQUARTERS DEPARTMENT OF TEXAS,
San Antonio, Tex., August 18, 1893.

GENERAL: I have the honor to submit, for the information of the Major-General Commanding the Army, the following annual report of military operations and affairs in the Department of Texas:

VIOLATIONS OF NEUTRALITY LAWS.

During the time from July to December, 1892, the troops on the Rio Grande were kept constantly scouting through the country that, during the preceding winter months, had been infested by the violators of our neutrality laws. Every report of a gathering of the so-called revolutionists or bandits was at once investigated, and generally by orders of the post commanders before they received notification from department headquarters, they acting under my general instructions to investigate at once any such matter.

As mentioned in my last year's report, the number of our troops along the Mexican frontier is inadequate. The immense river front and the lawless country back of it consist of many thousand square miles.

Press dispatches of December 13, 1892, published an account of bandits having attacked Mexican troops opposite San Ygnacio on the 10th of December, killing two officers and four soldiers and wounding others. Number of bandits reported to be one hundred and twenty-five. This place is 53 miles below Laredo.

I immediately wired the commanding officer at Fort McIntosh and ordered an investigation, and, if the report proved true, the prompt pursuit of these murderous scoundrels.

The newspaper account was confirmed the same day by dispatches from Mexican officials, which fact was telegraphed to the commanding officers of Forts McIntosh and Ringgold, and they were directed to coöperate in making every attempt to capture these violators of our neutrality laws.

Maj. A. S. B. Keyes, Third Cavalry, commanding Fort Ringold, had already through the Mexican consul near that point heard a rumor of this crossing and had sent out at once Lieut. P. W. West, Third Cavalry, with his troop (I) and the Seminole-Negro Indian scouts, Lieut. C. E. Hays, Eighteenth Infantry, commanding the latter.

He ordered out upon the receipt of my dispatch Lieut. G. T. Langhorne, Third Cavalry, with Troop C, same regiment, to march into the country back of San Ygnacio.

The commanding officer Fort McIntosh sent Lieut. C. A. Hedekin, Third Cavalry, with sixty men down the river with orders to pursue and capture the bandits who took part in this massacre. He also sent Lieut. E. S. Avis, Eighteenth Infantry, with a company of infantry to Rendado to establish a supply camp at that point.

Lieuts. West and Hedekin met at San Ygnacio, and from the reports of these officers it was learned that, about 11 a. m. on the 10th of December, 1892, one hundred and thirty-one bandits attacked the troop of the Sixth Mexican Cavalry, under Capt. Segura, stationed on the river opposite that point. The soldiers were at stables, and were unprepared. Ten men and two officers were killed, and twelve wounded; eleven escaped. The quarters were set on fire and the captain and several soldiers who had been wounded were thrown into the burning buildings by the bandits and burned to death. Of the surviving Mexican soldiers twenty-two, with the women and children, were driven to this side. The wounded were cared for by the citizens of San Ygnacio, Tex. It was claimed by Mexican authorities that these Mexican soldiers were detained there against their will as prisoners, but the matter was repeatedly investigated by officers at the time and such was found not to be the case. Most of these soldiers returned to their own country within a few days.

On my tour of inspection of our posts and camps on the Rio Grande border in March last I examined into the whole matter with the result that the reports of my officers were fully confirmed. A detailed report on the subject was made to the Major-General Commanding the Army at that time.

Although San Ygnacio is but 53 miles below Laredo and but 18 miles from Carrizo, the county seat of Zapata County, no word was sent to either place by the civil authorities. If this had been done, troops could have arrived more promptly on the scene of this brutal massacre.

Lieut. West, by using the Seminole-Negro Indian scouts, followed the trail of the bandits, now many days old, until it broke up and scattered in every direction. The officers and their troops then continued to scout for the bandits, which duty was very difficult on account of the character of the country infested by these outlaws, a mass of dense chapparal and cactus.

On December 17 I requested the Major-General Commanding the Army to send three troops of the Seventh Cavalry, that had been ordered to exchange with part of the Third at a later date, to this department at once. This request was granted.

On the 19th of December I ordered the reserve squadron, two troops of the Third Cavalry stationed at Fort Sam Houston, to proceed by rail to Realitos and Los Angeles, on the Mexican National Railroad, to there establish camps and to scout from those points. This squadron was organized as follows: Troop D, Capt. G. F. Chase, senior officer, commanding squadron, and Second Lieut. Kirby Walker; Troop K, Capt. G. K. Hunter, First Lieut. J. T. Dickman and Second Lieut. Julius Conrad, all of the Third Cavalry.

December 21 I ordered Troop E, Third Cavalry, officered by Capt. Oscar Elting and First Lieut. T. R. Rivers, to proceed at once by rail from camp at Pena Colorado to Laredo, for service in the field.

On December 24 Lieut. West, with his troop (I) and the Seminole Negro Indian scouts, found a trail, and following it came upon a party of about thirty-five bandits, who made a short stand, opening fire upon our troops, which being returned they fled. One bandit was killed and one wounded.

Lieut. West captured a number of papers and saddles, and burned or destroyed the provisions, etc., that the bandits left behind. He then followed the trail until it scattered in the dense chapparal and could be followed no longer.

The three troops of the Seventh Cavalry having arrived at Laredo on the 27th of December, I made the following arrangement of troops in the field: A line of camps on the Rio Grande, extending from Laredo to Rio Grande City, to prevent by daily patrols and scouting the possibility of armed bodies crossing the river; Troop E, Third Cavalry, Capt. Elting and First Lieut. T. R. Rivers, at San Ygnacio; Troop C, Seventh Cavalry, Capt. Henry Jackson and Second Lieut. T. M. Corcoran, at Carrizo; Troop G, Seventh Cavalry, Capt. W. S. Edgerly, at Lopena; Troop B, Seventh Cavalry, First Lieut. H. J. Slocum, at Salineno; Troops C and I, Third Cavalry, at Fort Ringgold. A second line of camps was established back from the river at Patrocinio and Las Comitas and a temporary field supply camp at Rendado; Troop A, Third Cavalry, Capt. J. O. Mackay and Second Lieut. C. A. Hedekin; Troop G, Third Cavalry, Capt. F. H. Hardie and Second Lieut. J. McI. Carter; Company G, Twenty-third Infantry, First Lieut. Stephen O'Connor and Second Lieut. Hugh Swain occupying them, respectively. They were to scout the country thoroughly and prevent the organization of armed bodies of bandits. A third line was established on the Mexican National Railroad: Troop D, Third Cavalry, Capt. Chase, near Realitos; Troop K, Capt. Hunter, near Los Angeles. All of the troops were to act at once upon any information they received, to coöperate when possible, and to thoroughly scout the country, not necessarily confining themselves to special sections. A map of the country showing the points occupied by the troops has been forwarded.

The Mexicans employed as guides proved generally worthless and to be aiding their friends, the bandits, more than the troops.

By authority of the War Department, and upon the suggestion of Capt. Chase, whose previous service in the infested region had rendered him familiar with the country, I employed Messrs. Joseph and Washington Shely, the former sheriff of Starr County, the latter deputy United States marshal and ex-ranger captain, both thoroughly acquainted with the country and the people. Through these other men were employed as scouts and were set to work to capture the now scattered violators of our neutrality laws and bring them to justice.

About this time the bandit leaders, realizing the vigorous and determined character of the efforts being made by the troops and marshals, made overtures through third parties looking to the surrender of their followers by betraying them into the hands of the troops, and arranged with the Shelys, with my approval, to bring as many of their men together as possible at a point agreed upon with the avowed purpose of again crossing the river and making a raid.

The experiment failed owing to quarrels among the bandits themselves. It is said that their leader, Francisco Benavides, had several men put to death for not obeying his orders. The leaders did not keep their agreement. Capt. Chase being informed of this through the

Shelys moved into that country and sent out a detachment under Lieut. J. T. Dickman, Third Calvary.

The latter was successful enough to have the leaders, Francisco Benavides and Prudencio Gonzales, captured by one of the squads of his detachment on January 21. The next day Lieut. Dickman came upon a small band and succeeded in capturing Cecilio Eschevarria, who made a sharp fight. This man was considered a most desperate bandit and was a deserter from the Mexican army. Maximo Martinez, who took a most important part in the San Ygnacio raid, surrendered to Sheriff Haynes.

February 23 Lieut. P. G. Lowe, Eighteenth Infantry, and Sheriff Shely, with two Seminole scouts, came upon a small band of outlaws and after a short fight succeeded in killing Eusabio Martinez alias Mangas de Agua, the most desperate of all the bandits.

Francisco Benavides was born in 1843 at Casas Blancas, on the Rio Grande, then considered a part of Mexico. He is ignorant and does not speak the English language. He has lived for the last thirty years at a ranch called El Clovis, in the northwestern part of the Federales region in Duval County, Tex.; was a simple ranchman, and although he gave aid to Catarino E. Garza, who attempted two years ago to start a revolution, yet he was not believed to be especially desperate or even a brave man. The affair at San Ygnacio showed his brutal cruelty. In October and November he made a trip through the river countries and by urgent persuasion got 160 men together for the invasion of Mexico for purposes of plunder. He was elected to command after much discussion. This was in no sense a continuation of the Garza movement, as the men who took part in it wished merely to raid and steal, although proclamations and efforts were made to give the raid a political character. Most of Benavides's followers were unable to read or write and all are ignorant. Numbers of them are criminals and wanted by the authorities on both sides of the river to answer for past crimes.

The country in which operations had to be carried on presented almost insuperable obstacles to success on the part of our troops, and ideal facilities on the other hand for the bandits to conceal their whereabouts and to evade pursuit and capture.

Inhabited as this district is by people, with a few exceptions, actively in sympathy with the bandits it was easy for the latter to keep accurately informed of the whereabouts and movements of the troops and at the same time to keep secret their own lurking places. Supplies could be readily obtained from their sympathizers, who, in addition to acting as spies for them, under the guise of peaceful sheepherders and ranchmen, also threw all possible obstacles in the way of their pursuers, and constantly endeavored by false information to mislead and mystify them.

Under these circumstances the success which attended the efforts of our troops, seconded by the intelligent and zealous assistance of Deputy United States Marshals Joseph and Washington Shely, may be considered almost phenomenal. As a result of their untiring efforts the bandits were kept constantly moving, fleeing from one place of concealment to another in small detachments to better avoid capture, until, their horses being worn out and themselves exhausted by hunger and fatigue, many of them were captured and many others, seeing further escape hopeless, in despair voluntarily surrendered. Of the 132 that have been captured by our troops and scouts 86 have been identified

as participants in the San Ygnacio raid. A list is appended of the 71 convicted and sentenced at the last May term of the United States district court. I regret that under our laws more severe punishment can not be given the leaders of such an unlawful raid and brutal massacre as that of December 10 last. Possibly after they have served the sentences awarded by our courts the extradition by Mexico of those guilty of murder and similar crimes may be effected.

Mr. A. J. Evans, United States district-attorney, has by his advice given much assistance to the officers under me and has taken extraordinary interest in bringing the guilty violators of our neutrality laws to trial and ultimate conviction.

A sum of secret-service money was applied for by me and this having been judiciously used by Maj. A. S. B. Keyes has accomplished much.

The Seminole-Negro Indian scouts have been of much use and are considered most valuable adjuncts by officers serving with or near them. At the suggestion of Lieut. G. T. Langhorne, Third Calvary, these scouts were transferred from near Fort Clark to the seat of the border troubles. Later, by authority of the War Department upon my application, these scouts were increased to the number of 35.

To illustrate how constantly troops in the field were kept employed official reports show that between July, 1892, and May, 1893, Troop C, Third Cavalry (Bourke's), marched as a troop 1,300 miles; Troop H, Third Calvary (Chase's), by detachments and full troop, 2,823 miles; Troop E, Third Cavalry (Elting's), by detachments and full troop, 2,577 miles; Troop G, Third Cavalry (Hardie's), by detachments and full troop, 4,290 miles. The three troops of the Seventh Cavalry, by squadron, troops, and detachments, marched 3,623 miles.

While all officers in the field acquitted themseves creditably and performed their full duty, I desire to emphasize my appreciation of the valuable services rendered by Capt. George F. Chase, Third Cavalry, who in command of a squadron in the field displayed tireless energy and great tact and discretion in carrying out his instructions. It is no disparagement to the valuable services of others to say that credit for a large share of the results attained is due this officer.

First Lieut. Parker W. West, Third Cavalry, is entitled to honorable mention for the good judgment, zeal, and bravery displayed by him in pursuing, overtaking, and inflicting severe loss upon a party of bandits as mentioned above.

First Lieut. Joseph T. Dickman, Third Cavalry, is also entitled to high commendation for the energy, skill, and good judgment displayed by him in the conduct of a scout, resulting in the capture of Francisco Benavides, the leader of the bandits, Prudencio Gonzales, and Cecilio Eschevarria, the latter (Eschevarria) surrendering only after a most desperate resistance. Second Lieuts. Kirby Walker and Julius T. Conrad, Third Cavalry, took an active part in effecting these captures, displaying coolness and intrepidity, while Sergt. Frederick P. Krarup, Troop D, Third Cavalry, in command of a squad, by the display of nerve and good judgment at a critical moment prevented the escape of Benavides and Gonzales.

Second Lieut. George T. Langhorne, Third Cavalry, made many long and arduous scouts from his post, Fort Ringgold, frequently in command of Troop C, and at other times of both Troops C and I, Third Cavalry, and his valuable reports and intelligent suggestions I very highly appreciated. In partial recognition of Lieut. Langhorne's exceedingly valuable services in the field, in this and previous border campaigns, I selected him for duty on my personal staff.

Second Lieut. Percival G. Lowe, Eighteenth Infantry, while rendering effective service as commander of the Seminole-Negro Indian scouts, deserves special mention for the part he took in the surprise and killing of the notorious desperado Mangas de Agua.

First Lieut. Stephen O'Connor, Twenty-third Infantry, commanding Company G, Twenty-third Infantry, while encamped near Rendado, in the center of the disaffected region, by his extraordinary activity in scouring the adjacent country and by keeping himself thoroughly posted as to the movements of the bandits' sympathizers, by whom he was surrounded, succeeded in overawing the latter and preventing them from being of material assistance to those who were openly defying our laws.

Capt. Francis H. Hardie, Third Cavalry, by reason of his familiarity with the country and its lawless element, gained in the course of previous campaigns, rendered the department commander valuable assistance in stationing troops and detachments at points where they could be of most service, and in addition made many long and fatiguing scouts with his troop over a large region of country.

Capt. John G. Bourke and Second Lieut. Charles A. Hedekin, Third Cavalry, also displayed extraordinary activity.

Maj. A. S. B. Keys, Third Cavalry, and Capt. Henry Jackson, Seventh Cavalry, the former in command of Fort Ringgold and the latter commanding the Seventh Cavalry squadron in the field, also contributed materially in bringing about the results obtained.

Our officers coöperated whenever practicable with the commanders of the Mexican troops along the river, the latter in turn doing all in their power to contribute to the success of our plans. That the Mexican authorities, civil as well as military, appreciated the work done by our troops is evidenced by their very complimentary expressions to that effect communicated to me through the Department of State.

While making a tour of inspection of the posts and camps along the river between and including Forts Brown and McIntosh, accompanied by Lieut. Mallory, aid-de-camp, in March and April, I was the recipient of many courtesies and hospitalities at the hands of Brig. Gen. Emiliano Lojero, commanding at Matamoras; Col. Antonio Mainero, commanding the Fourth Regular Cavalry at Reynosa, and Col. (now brigadier-general) Louis Ceron, commanding at Nuevo Laredo.

I also desire to express my appreciation of the many courtesies shown and valuable assistance rendered in the way of furnishing reliable information by Dr. Plutarco Ornelas, consul of Mexico at San Antonio.

FORT MC INTOSH, TEX.

I again call attention to the necessity for and strategic importance of a large post in the vicinity of Laredo, Tex., and renew my recommendation made in a special report that title to a new site near the present one be obtained and that Fort McIntosh be replaced by a more commodious post of a permanent character.

ABANDONMENT OF CAMP PENA COLORADO, TEXAS.

There being no longer any necessity for the maintenance of a camp at Pena Colorado, Texas, and the ground for the purpose being rented by the Government, its occupation was, with the approval of the War Department discontinued and the lease terminated. Capt. Elting's troop, E, of the Third Cavalry, which constituted the garrison was ordered into the field for duty in connection with the border troubles.

EXCHANGE OF STATIONS OF THIRD AND FIFTH CAVALRY.

In compliance with General Orders No. 36, dated Headquarters of the Army, May 2, 1893, the Third Cavalry was transferred from this Department to the Department of the Missouri and was replaced by the Fifth Cavalry. In this connection I desire to refer to the service of the Third Cavalry in this Department. Since the arrival of the regiment in Texas in 1885 its record for hard work and faithful service in the field under the most trying conditions is in my opinion unsurpassed by that of any other regiment in the service.

OFFICERS ON DETACHED SERVICE.

The absence of a large number of officers from the Department on detached service, under orders from higher authority, entails extra work on those present for duty with their regiments amounting in some instances almost to a hardship.

While the troops are at present in a satisfactory state of discipline and efficiency the present scarcity of officers for duty, if much longer continued, is likely to seriously impair the efficiency of entire regiments.

GYMNASIUMS.

I renew my recommendation of the previous year on the subject of the establishment of post gymnasiums.

LYCEUMS.

As required by General Orders, No. 80, Adjutant-General's Office, 1891, I submit herewith a statement of work accomplished during the past year in the lyceums of the various posts in this Department. The papers read and the progress made give evidence of interest in the work, and of creditable professional study and research on the part of officers generally.

POST EXCHANGES.

Post exchanges continue to accomplish admirably the purposes for which they were established and doubts as to their being on the whole of substantial benefit to the service should no longer exist.

LAUNDRIES.

In my opinion the establishment of steam laundries at permanent posts in this department, and their operation as far as practicable at Government expense, is almost a necessity. Enlisted men are now required to use many more articles of clothing requiring frequent washing than formerly, such as white trousers and blouses, linen collars, bed sheets, pillow cases, etc. The extra laundry expense involved falls upon the enlisted men, although no corresponding increase of pay or allowances is made. In this climate the wearing during many months of the year of the authorized duck clothing is imperative; the troops are required of course to keep this clothing clean and neat, and a considerable increase in the monthly laundry bill results. In justice to the soldier this expenditure should be reduced to the minimum. Possibly

by some additions to the plant of post sawmills and the utilization, as far as practicable, of the labor of the troops, no great expense would be involved.

CLOTHING, ETC.

It is a general complaint among cavalry officers that the dress coat prescribed for them is too long. There would appear to be as much reason for making the coat of the cavalry officer shorter than that of the infantry officer, as there is for making the coat of the cavalry soldier shorter than that of the infantry soldier. The present style of boot for enlisted men is also generally complained of. What is most found fault with is that the instep is so low that when wet the boot can only be drawn on with difficulty. The remedy usually suggested is that of having the bootlace over the instep. The complaint is also made that the leg flares too much at the top. Shoes and leggins were generally preferred by the mounted men engaged in campaigning recently in the Rio Grande chaparral to the regulation boot. Drawers of lighter weight for summer wear should be furnished to troops serving in this department.

STATE ENCAMPMENT.

In compliance with the request of the State authorities I directed the commanding officer Fort Sam Houston to send to Austin, Tex., all of the troops that could be spared from his garrison to take part in the annual encampment at that place of the Texas Volunteer Guard. Accordingly headquarters band, the four companies of the Twenty-third Infantry, Light Battery F, Third Artillery, and a squadron of two troops Fifth Cavalry encamped with the State troops during the period of the encampment—July 23 to July 30.

The following officers were present for duty with the regular troops: Col. J. J. Coppinger, Twenty-third Infantry, commanding; First Lieut. J. K. Thompson, adjutant Twenty-third Infantry; First Lieut. W. A. Nichols, quartermaster Twenty-third Infantry; Capt. R. I. Eskridge, Twenty-third Infantry, commanding infantry battalion; Second Lieut. Matthias Crowley, Fifth Infantry, adjutant infantry battalion. Company H, Twenty-third Infantry: Second Lieuts. Hugh Swain and H. G. Cole, Twenty-third Infantry. Company F, Twenty-third Infantry: First Lieut. Lea Febiger and Second Lieut. T. F. Schley, Twenty-third Infantry. Company E, Twenty-third Infantry: Second Lieuts. H. C. Clark and F. W. Kobbé, Twenty-third Infantry. Company F, Fifth Infantry: Capt. G. P. Borden, Fifth Infantry. First Lieut. G. W. Read, Fifth Cavalry, commanding cavalry squadron; Second Lieut. E. B. Winans, jr., Fifth Cavalry, adjutant cavalry squadron. Troop A, Fifth Cavalry: First Lieut. G. W. Read and Second Lieut. E. B. Winans, jr., Fifth Cavalry. Troop H, Fifth Cavalry: First Lieut. J. B. Bellinger, Fifth Cavalry. Light Battery F, Third Artillery: Capt. J. B. Burbank, First Lieuts. J. D. C. Hoskins and G. T. Bartlett, and Second Lieut. Edgar Russel, Third Artillery. Medical department: Capt. R. J. Gibson, assistant surgeon. Noncommissioned staff and band Twenty-third Infantry.

I accepted the governor's invitation to visit the encampment as his guest, accompanied by Second Lieut. G. T. Langhorne, Third Cavalry, aid-de-camp. I am convinced that the regular troops by their presence, example, and participation in the military exercises of the volunteers were of material assistance to the latter. Through the courtesy

of the International and Great Northern Railroad the infantry were transported to and from the camp without expense to the United States. The mounted troops marched.

Governor Hogg and Adjt. Gen. Mabry expressed to me their high appreciation of the service rendered by the regular troops during this encampment. From them and from the division and brigade commanders we were the constant recipients of a most generous hospitality.

Attention is invited to the accompanying detailed reports of the department staff whose duties have been most satisfactorily performed. They are as follows: Lieut. Col. James P. Martin, assistant adjutant-general; Maj. Peter D. Vroom, inspector-general; Capt. Francis J. Kernan, acting judge-advocate; Maj. Gilbert C. Smith, chief quartermaster; Maj. John F. Weston, chief commissary of subsistence; Col. Joseph C. Baily, medical director; Col. Charles M. Terrell, chief paymaster; First Lieut. Henry L. Ripley, Third Cavalry, acting engineer officer; Maj. Clarence E. Dutton, chief ordnance officer.

The report of First Lieut. John E. Myers, Third Artillery, inspector of small-arms practice of the department, will be forwarded in due time.

I desire to express my high appreciation of the services of my aids-de-camp, First Lieut. John S. Mallory, Second Infantry, and Second Lieut. George T. Langhorne, Third Cavalry, who have performed with zeal and industry the duties assigned them in field and quarters.

I am, general, very respectfully, your obedient servant,

FRANK WHEATON,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL U. S. ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. WILLIAM P. CARLIN.

HEADQUARTERS DEPARTMENT OF THE COLUMBIA,
Vancouver Barracks, Wash., August 19, 1893.

SIR: I have the honor to submit the following report of operations and affairs in this military department during the past year.

Assigned to the command of the department by General Orders No. 47, current series, from the headquarters of the Army, promulgating the orders of the President, my service in that capacity dates from the 13th of June, 1893.

The relations existing between the white population within the limits of the department and the various Indian tribes during the year have been peaceable and friendly.

PUYALLUP INDIAN RESERVATION.

April 27, 1893, the Major-General Commanding the Army directed that a judicious officer be sent from Vancouver Barracks to Puyallup Indian Reservation to investigate the attempt of Frank C. Ross to enter upon and build a railroad on lands allotted to the Indians, and suggesting that if the presence of an officer could not produce the required effect to prevent the encroachment, a detachment from Vancouver Barracks, under an efficient officer, should be sent to his aid.

April 28 Maj. John W. French, Fourteenth Infantry, left Vancouver Barracks for Puyallup Indian Reservation near Tacoma, Wash., and on April 29 ordered Frank C. Ross to desist from railroad-building upon the reservation, and that he and his employés leave the reservation at once. Mr. Ross declined to comply, and on May 12, 1893, pursuant to direction of the President, Capt. Gilbert S. Carpenter, with his company, G, Fourteenth Infantry, was ordered from Vancouver Barracks to the Puyallup Indian Reservation with instructions to render with his company such assistance to the agent as might be necessary to prevent encroachment, etc.

On May 16 Capt. Carpenter reported that an injunction from the superior court of King County, Wash., had been served upon him to be heard in Seattle, Wash., which made inoperative the instructions under which his command was ordered to this reservation.

On May 20 the injunction suit was removed to the United States court, and on June 23, 1893, Capt. Carpenter reported that he had been served with the restraining orders of the United States circuit court, continuing in perpetuity the temporary injunction previously served.

An appeal from the decision confirming the injunction as above was taken direct to the Supreme Court of the United States by the United States district attorney, June 27, 1893, pursuant to instructions from the Attorney-General of the United States.

With the approval of the Acting Secretary of War and sanction of the Department of the Interior, the troops at the Puyallup Indian Reservation were withdrawn August 3, 1893, by the direction of the Major-General Commanding the Army.

INDIANS AS SOLDIERS.

In regard to Indians as soldiers, I have to report that it has been found impossible to enlist a full company or troop of Indians, and the small number enlisted have not proved satisfactory. The undersigned has, therefore, recommended their discharge from the service.

DEFENSIVE MEASURES NEEDED.

The rapid growth of population and development of commercial interests within the geographical limits of the department, especially in the States of Washington, Oregon, and the States adjoining, since the advent of four great transcontinental railroad lines, urgently calls for many changes in administration and defensive measures for this section of the country.

I would especially invite attention to the reports and recommendations repeatedly made by my predecessors on this most important subject, viz: Brigadier (now Major-General) N. A. Miles, Brig. Gen. John Gibbon, and Brig. Gen. A. V. Kautz.

This matter has been so often reported to the War Department by my predecessors that I will now make no further reference to it

DESERTIONS.

It is to be regretted that desertions have increased very much during the past year. In this connection I respectfully refer to the accompanying report of Lieut. Col. John M. Bacon, First Cavalry, acting inspector-general of the department. He attributes this increase, in part at least, to the passage of the law limiting the whole length of

service of the soldier to ten years. It is probable that some men who enlisted originally with the intention of passing the active part of their lives in the military service feel aggrieved at being debarred by this law and deserted in consequence of it. While there are apparently some good reasons for establishing such a law to govern enlistments in the military service, the number that would actually be affected by it is so small that the special benefit from it would be inappreciable. I therefore respectfully recommend that it be repealed.

CONCENTRATION OF TROOPS.

The attention of the Major-General Commanding the Army is again invited to the benefit to the Government and the service that would result from the discontinuance of some of the small posts in this department. Prominent among them is Fort Spokane, Wash. Since its construction and occupation by troops, two railroads have been built from Spokane City which could carry troops and supplies to the region occupied by Indians in less time than they could march from Fort Spokane. This post is 25 miles from a railroad. Supplying it by wagon transportation is very expensive to the Government, and it is practically useless.

I again respectfully urge that a post be built near Spokane Falls, or that additional barracks and quarters be erected at Fort Sherman, and that the troops now at Fort Spokane be ordered to the new post or to Fort Sherman.

Fort Townsend could be of no service in protecting the cities and harbors on Puget Sound. The troops now there could be more usefully employed in garrisoning some important point in those waters.

One, if not two posts in addition to those named, could be abandoned with advantage to the Government, and the garrisons could be placed where they would in the future be more useful. But until superior authority shall call for information on this subject it is deemed advisable not to specify the posts. It is clearly manifested that, in consequence of the extension of railroads to all localities where military posts have for years past been maintained, the necessity for these small posts has ceased to exist, and that one post, at or near the principle railroad center, will serve all the legitimate military purposes of the four posts in this department east of the Cascade range of mountains. Spokane is the railroad and commercial center of that region. Fort Sherman is by railroad 33⅓ miles out of Spokane, and is practically at or near enough to the railroad center.

Fort Canby, at the mouth of the Columbia River, will be a point of great importance in time of war with any naval power. It is, however, in winter time very difficult to approach by water and is practically inaccessible by land. It is, in consequence of its exposure to the high winds from the ocean, the difficulty of ingress and egress, and the very contracted area of land to which the troops are by its topography confined, a post that should be garrisoned only in time of war. As a life-saving station it is indispensable. An ordnance sergeant and party of men sufficient to keep the batteries and guns in proper condition should be kept there. No other garrison is required in time of peace.

Fort Stevens, on the opposite point (south), is also a point of great importance, and should be strongly fortified and armed with the most effective guns. The country to the south and east is comparatively open and it can be garrisoned at all times in peace and war. A force sufficient to man the batteries at both Canby and Stevens should be

kept at Fort Stevens. It is now in charge of the Engineer Corps of the Army. When its fortifications, armament, and the jetty are completed it is respectfully recommended that it be garrisoned by three batteries of artillery in time of peace, and that the garrison at Fort Canby, excepting the ordnance sergeant and party for keeping guns and batteries in repair, be withdrawn.

DISCIPLINE AND INSTRUCTION.

The discipline of the troops of this department is entirely satisfactory. Through the operation of the lyceum and exercises in the new drill regulations and target practice the theoretical and practical instruction of officers and men have made praiseworthy progress. The papers read before the lyceums, so far as my personal observation has extended, are creditable to the officers and show careful reading of military history and works on military subjects. This institution has been and will continue to be very beneficial to the military service, and should be maintained permanently.

For particulars relative to the conduct of affairs in the general staff departments and recommendations by the chiefs of the same at these headquarters, as to particular matters, attention is requested to the reports appended.

I am, sir, very respectfully, your obedient servant,

WILLIAM P. CARLIN,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL U. S. ARMY,
Washington, D. C.

REPORT OF THE COMMANDANT OF THE UNITED STATES INFANTRY AND CAVALRY SCHOOL.

UNITED STATES INFANTRY AND CAVALRY SCHOOL,
Fort Leavenworth, Kans., August 1, 1893.

GENERAL: I have the honor to submit my annual report of the operations and wants of the United States Infantry and Cavalry School for the year ending June 30, 1893.

This period covered the second year of the student class which entered September 1, 1891, and which was graduated June 16, 1893.

The course of study began September 1, 1892, and continued steadily throughout the year. Of the thirty-six officers comprising the class as it began its studies in the first year's course thirty-three remained to the end, one was ordered to duty as an assistant instructor at the Military Academy, West Point, and two were relieved on account of ill health or defective eyesight. Of the thirty-three who continued through the entire course but one, Second Lieut. George W. Martin, Eighteenth Infantry, failed to graduate. A few others whose examinations at various times were declared by the school staff to be unsatisfactory were, upon a subsequent examination, as provided by paragraph 48 of the school regulations, declared proficient.

In the case of Lieut. Martin I am satisfied his failure is due to a defective early education and his age at admittance being too advanced

to admit of a methodical application to his studies. It is with great pleasure that I have to state that every member of the class who reported to me March 1, 1891, for preliminary instruction (excepting Capt. C. B. Thompson, assistant quartermaster, who was relieved before the commencement of the regular course) succeeded in graduating, and in most cases with an excellent standing, thus proving beyond a doubt the great value of this preliminary course to the officer whose previous knowledge of the higher mathematical branches may have been defective. It is to be hoped that the experiment may be equally successful with those members of the incoming class who have already reported for similar instruction.

It is with great satisfaction that I can certify to the exceptionally high standard of efficiency attained by the last class, the first four members of which reached an average of over 98 per cent for the two years' course of study, and the next of over 97 per cent.

I would therefore recommend that the following-named officers, five in number, be declared honor graduates of the United States Infantry and Cavalry school class of 1893, and so entered upon the Army Register, viz: Second Lieut. P. D. Lochridge, Second Cavalry; First Lieut. M. J. O'Brien, Fifth Infantry; Second Lieut. S. H. Elliott, Fifth Cavalry; Second Lieut. T. H. Slavens, Fourth Cavalry; First Lieut. A. L. Parmerter, Twenty-first Infantry.

First Lieut. James T. Anderson, Twenty-fifth Infantry, notwithstanding severe illness, which required him to be absent on sick leave for several months, succeeded in keeping up with his class and finally passed all the required examinations with credit.

The graduating exercises took place in the post chapel and were substantially the same in character as in June, 1891. It was greatly regretted that no board of visitors was present on this occasion, as heretofore.

The following is a synopsis of the work in the different departments, for further particulars of which reference is invited to the reports of the instructors, herewith inclosed.

DEPARTMENT OF MILITARY ART.

This department has, as heretofore, been under the charge of Lieut. Col. Jacob Kline Ninth Infantry, assisted by Capt. G. S. Wilson, Twelfth Infantry, Capt. W. A. Shunk, Eighth Cavalry, and First Lieut. C. H. Barth, Twelfth Infantry.

It has fully maintained during the past year its former high reputation. The instruction has been confined to the study of Hamley's Operations of War, as well as the practical solution of minor tactics.

There will be an entire change in the corps of instructors in this department during the coming year. Lieut. Col. Kline, who for a number of years has with marked ability filled the position of head of the department, has been relieved from further duty at the school. He will be succeeded by Capt. A. L. Wagner, Sixth Infantry. Capt. Shunk, having also completed a four years' tour, has been relieved and will be replaced by First Lieut. E. Swift, Fifth Cavalry. Capt. Wilson will assume the duties of assistant instructor in the department of infantry, and First Lieut. Barth has been relieved from further duty in the school, having been appointed adjutant of his regiment. These officers will be replaced, respectively, by First Lieut. Carl Reichman, Ninth Infantry, and M. J. O'Brien, Fifth Infantry.

DEPARTMENT OF INFANTRY.

This department has also been under the charge of Lieut. Col. Kline, assisted by Capts. S. M. Swigert, Second Cavalry, J. F. Stretch, Tenth Infantry, and James Fornance, Thirteenth Infantry. Capt. Swigert will be continued on duty in the department of cavalry and will be succeeded by Capt. G. S. Wilson, Twelfth Infantry, in the department of infantry. The instruction in this department has been confined to the study of Mayne's work on "Fire Tactics" and the "Drill Regulations." With the new class Mayne's book will be superceded by Bachelor's "Fire Discipline."

DEPARTMENT OF CAVALRY.

This department has been under charge of Maj. C. C. C. Carr, Eighth Cavalry, assisted by Capts. Francis Moore, Ninth Cavalry, J. B. Babcock, Fifth Cavalry, and S. M. Swigert, Second Cavalry. The first two were separated from the school—Capt. Moore by promotion and Capt. Babcock by transfer to Washington on special duty. They were succeeded by Capt. E. P. Andrus, Fifth Cavalry, and First Lieut. Thomas Cruse, Sixth Cavalry. Capt. Andrus has since been transferred to the Department of Texas, and it is my intention to detail Capt. W. H. Carter, Sixth Cavalry, in his stead. The assistants in this department will then consist of Capts. Swigert, Second Cavalry, Carter, Sixth Cavalry, and First Lieut. Cruse, Sixth Cavalry.

The instruction in this department has consisted of the study of Dwyer's Bits and Bittings, a subject which is very extensive and has been thoroughly taught.

DEPARTMENT OF ENGINEERING.

This very important department has been under the charge of Capt. William D. Beach, Third Cavalry, who has shown the greatest possible interest in his work. That the result has been eminently successful is conceded by all who have observed his constant efforts. Practical work in this department has been its principal feature and has been most successfully carried out. He has been most ably assisted by First Lieuts. E. A. Root, Nineteenth Infantry, and J. T. Haines, Fifth Cavalry. A further amplification of this course is under consideration and will be accomplished if circumstances admit.

The department needs additional instruments occasioned by the large increase in the membership of the incoming student class. A requisition for these instruments has already been forwarded. It is my intention to introduce in this course some instruction in the use of high explosives, using the work of Lieut. Willoughby Walke, Fifth Artillery, for this purpose.

There will be a change in the list of assistant instructors in this department, First Lieut. J. T. Haines, Fifth Cavalry, being relieved, and First Lieut. W. C. Wren, Seventeenth Infantry, and Second Lieut. T. H. Slavens, Fourth Cavalry, being ordered to duty therein.

DEPARTMENT OF LAW.

The course in this department under the able supervision of Capt. J. M. J. Sanno, Seventh Infantry, has been most satisfactory to me in every respect, every branch required by the school regulations having

been fully covered. In view of the transfer of Capt. E. P. Andrus, Fifth Cavalry, to another post, and of First Lieut. Thomas Cruse, Sixth Cavalry, to the department of cavalry, who have been assistant instructors in this department, I propose to detail in this branch First Lieuts. C. W. Abbott, jr., Twelfth Infantry, and F. G. Hodgson, Sixth Cavalry. These officers, with First Lieut. C. W. Penrose, Eleventh Infantry, will constitute the corps of assistant instructors in this department.

DEPARTMENT OF MILITARY HYGIENE.

Maj. John Brooke, surgeon U. S. Army, has had charge of this part of the course, which he succeeded in making very attractive to the members of the student class. As will be seen by his report, he suggests that there be added to this branch a brief course on the subject of the transportation of wounded in time of war. This suggestion I will endeavor to carry out should time permit.

It is gratifying to note that a number of new text-books, prepared by officers connected with the infantry and cavalry school have received the approval of the War Department and have been adopted for the use of the Army. They will be used as text-books in the course of study for the next class. Works on field engineering, surveying, and topography are also in course of preparation by the instructors in the department of engineering, and will be ready in due time.

In the month of January, 1893, was completed a handsome three story brick building, erected to accomodate unmarried officers.

This was at once fully occupied by twenty-four officers, each having two rooms and bathroom. The pressure for quarters was relieved immediately, though there are still buildings used as quarters which are highly unsanitary and should be replaced by others at the earliest practicable moment.

Within a few weeks the subsistence depot of Fort Leavenworth has been discontinued and the building turned over to the post, to be used in connection with the school. By means of this I will be enabled to obtain the use of a fine brick building contiguous to the present Sherman Hall (the academic building) and which only needs remodeling of the interior to render it suitable for school purposes for many years to come, even though the number of students be largely increased. To this end I directed the instructor in the department of engineering to submit plans for the necessary alterations. These have been made and are now in the hands of the post quartermaster, Capt. F. H. Hathaway, assistant-quartermaster, to submit an estimate of the cost.

The plans and estimates will be forwarded to Headquarters of the Army as soon as I receive them from the quartermaster.

I earnestly urge that this work be done as soon as possible, as the new building is greatly needed even now, due to the increase in number of the incoming over former classes, which necessitates an increase in the number of sections.

Suitable rooms are also required for the course in photography, and for the care of the many delicate instruments in the engineering department. All this can be secured by the alterations in the buildings referred to.

I would also respectfully recommend that the yearly appropriation of $1,500 be increased to $5,000, or at least to $3,500. It is with great difficulty that the usual sum can be made to cover all the necessary expenses of the school and leave a respectable amount to devote to the

increase of the library. An increase in our printing facilities is very much needed. The printing of original papers and translations for the use of the school, instructors, and students is being constantly required, and very valuable productions have already appeared through the school press, but it is a difficult task on account of the limited quantity of material at hand. An increase in the yearly appropriation would obviate this difficulty.

The services of a permanent clerk are very much needed. The present clerk is an enlisted man, liable to be transferred at any time, should the company to which he belongs be ordered elsewhere. It is respectfully requested that Sergt. P. F. Hoffman, Company H, Fourteenth Infantry, the clerk above referred to, who has proved himself to be most efficient, be transferred to the general service and ordered to report to me for duty. In connection with this I refer to the report of the secretary of the infantry and cavalry school, herewith inclosed.

It gives me great pleasure to testify to the willing coöperation of all my assistants in forwarding the work of the school and insuring its success, and in this none has more thoroughly devoted himself than First Lieut. W. S. Scott, First Cavalry, the secretary.

I am, sir, very respectfully, your obedient servant,

E. F. TOWNSEND,
Colonel Twelfth Infantry, Commandant.

The ADJUTANT-GENERAL, U. S. ARMY.
Washington, D. C.

REPORT OF THE COMMANDANT OF THE UNITED STATES ARTILLERY SCHOOL.

UNITED STATES ARTILLERY SCHOOL,
Fort Monroe, Va., August 29, 1893.

SIR: I have the honor to submit for the information of the Major-General Commanding the Army, the annual report of the United States Artillery School and post of Fort Monroe.

The following officers reported to the commandant on September 1, 1892, and constitute the present class of student officers: First Lieuts. William R. Hamilton, Fifth Artillery; James E. Runcie, First Artillery; Warren P. Newcomb, Fifth Artillery; Thomas Ridgway, Fifth Artillery, and Charles F. Menoher, Third Artillery. Second Lieuts. Herman C. Schumm, Second Artillery; Charles C. Gallup, Fifth Artillery; Moses G. Zalinski, Second Artillery; William L. Kenly, Fourth Artillery; Walter A. Bethel, Fourth Artillery; Morris K. Barroll, Fourth Artillery; Archibald Campbell, Third Artillery; John P. Hains, Third Artillery; William Lassiter, First Artillery; George Le R. Irwin, Third Artillery; Colden L'H. Ruggles, Third Artillery; George Montgomery, Second Artillery; Clint C. Hearn, Second Artillery, and Daniel W. Ketcham, Second Artillery. On account of temporary physical disability, Lieut. Bethel was relieved from duty at the school, and Second Lieut. Thomas B. Lamoreux, Fourth Artillery, reported in his place October 12, 1892.

First Lieut. James E. Runcie, First Artillery, was reported sick October 26, 1892, and has been absent on sick leave since November 26, 1892, with little probability of rejoining the class. Lieut. Hains

has been sick since May 13, 1893, and on sick leave of absence since June 27, 1893. Lieut. Ruggles was detached from the school and on duty with the World's Columbian Exposition at Chicago from February 25 to July 27, 1893. With these exceptions the studies and work prescribed for the first year of the school have been pursued by the class without serious interruption and with gratifying results.

COURSES OF STUDY.

The first year's course embraces engineering, artillery, interior and exterior ballistics, and hygiene. The nature and scope of these studies are fully set forth in the programme of instruction; the methods employed have been described in former reports. Instructors are diligent and earnest in the work of improving their several courses of study from year to year, and in subject-matter as well as methods of instruction these courses are of a high standard and well adapted to the requirements of the school. Changes have been suggested in the arrangement of some of the courses of study, and some change will doubtless become necessary in time, but as yet the staff has considered such changes inadvisable.

As stated in a previous report, the present curriculum of studies presupposes some scientific attainments and a knowledge of higher mathematics as well as habits of study. It is very desirable, therefore, that officers who are to take this course should be sent here sometime during the first ten years of their service, but for obvious reasons not until they have been at least two years with their regiments. They would then be in a condition to take up the studies of the school more advantageously, and there would be a more just basis of comparison and classification of the work done by them. Such as have not had the necessary previous training, or who have not kept up their mathematical studies, necessarily omit those parts of the course involving such knowledge.

Members of the class ought not to be considered available for detached service, or for any detail elsewhere, except in cases of emergency. It is impossible for a student officer to make up, during the course, what is lost by a comparatively brief absence, and he can not in that case be graduated. Besides such details have an injurious effect upon the school.

The assembly in Hampton Roads during the month of April, of the naval forces which participated in the International Naval Review in New York, made it necessary to suspend the exercises of the school for a short period, but this interruption was more than compensated for by the opportunity it afforded the officers of the school to see and examine the different vessels composing this large assemblage of modern war ships, and to meet the officers serving with them. Our boat landings were enlarged to meet the occasion, and these, with such other facilities as the post affords, were placed at the disposal of the admiral in charge of the rendezvous.

DIVISION FOR ENLISTED MEN.

The enlisted men's division of the school continues to merit the favorable opinions heretofore expressed, and the results of its instruction, in giving to noncommissioned officers a more thorough and comprehensive knowledge of their duties, are most beneficial. The following, having completed the prescribed two years' course, were given the

certificate authorized by the regulations of the school: First Sergt. J. M. Jones, Battery H, Fourth Artillery; Sergt. L. Doner, Battery G, Fifth Artillery; Sergt. T. C. Jones, Battery H, Fourth Artillery; Corpls. N. Waring and J. J. Power, Battery M, Third Artillery, and Corpl. J. Spokes, Battery G, Fifth Artillery. Of the above, First Sergt. J. M. Jones, Battery H, Fourth Artillery, and Corpl. J. J. Power, Battery M, Third Artillery, received special mention, as did also Corpls. George McCourt, Battery H, Fourth Artillery, and A. W. Whitehead, Battery G, Fifth Artillery.

PRACTICAL EXERCISES.

Drills and other practical military exercises during the year included the service of the different classes of guns in use at the school—machine, field, siege, and seacoast—maneuvers with lifts, shears, gins, and other artillery machines, in mounting, dismounting, and moving heavy guns and carriages; also infantry company and battalion drills. Firing at targets with the 15-inch S. B., 8-inch C. R., 8-inch and 10-inch siege mortars, field and machine guns, and small arms.

This practice was conducted with the usual care and with the object of imparting to student officers and gunners the greatest possible information. As yet the school is without modern siege or seacoast guns, but these are now about to be supplied.

In addition to the foregoing, elementary, theoretical and practical instruction was given in photography, cordage, and telegraphy.

LIBRARY, PRINTING OFFICE AND BINDERY.

There have been added to the library during the year 2,100 volumes, 186 by purchase, 1,800 from the War Department Library, and 114 from other sources. The library is a very valuable one and now contains about 10,278 volumes. Its shelves are overcrowded and a new fireproof building should be provided for it.

The work of the printing office and bindery was about the same in character and quantity as that done the previous year.

ARTILLERY SCHOOL APPROPRIATION.

The amount annually appropriated for the school, $5,000, was fixed some years ago when the school was in a more elementary condition than it now is. In common with other institutions its development has kept pace with the progress made in military knowledge, and the character of its instruction and the means employed now call for a slight increase in the annual appropriation. The estimate for the ensuing year is based upon actual necessities and the amount asked for—quite insignificant when compared with the end in view—is the smallest compatible with efficiency.

POST SCHOOL FOR ENLISTED MEN.

The post school for enlisted men has attracted the attention and interest of many of the younger soldiers, and has resulted in much benefit to them. The whole number enrolled during the year was 84, average attendance, 51. Interest increased rather than diminished throughout the year, due, I think, to the organization of the school into classes, or sections, according to previous attainments, so that each

section received from the instructor the kind and amount of attention it needed.

SANITARY CONDITION.

The health of the command continues good, attributable largely to the salubrity of the climate. The sewerage of the entire reservation is unsatisfactory and dangerous, and until that is improved proper sanitary conditions can not be maintained. Two officers (one of the Corps of Engineers) are now on sick leave of absence convalescing from typhoid fever believed to have been contracted at the hotel. The early construction of a proper sewerage system for the entire reservation is an urgent necessity.

DISCIPLINE.

The discipline of the command has been excellent. Duty has been faithfully and efficiently performed and there has been no instance of a serious infraction of discipline during the year. Desertions have amounted to a little more than 1 per cent. For more than a year and a half the post has been practically self-supporting in the matter of recruits of the best quality.

Two batteries, E and K, Fourth Artillery, have been added to the permanent strength of the garrison, making eight in all—three of the Fourth Artillery. These are all instruction batteries, and it is very desirable that they should be taken as equally as possible from the five regiments of artillery in service.

QUARTERS, ETC.

Notwithstanding the recent additions to the number of officers' quarters, the addition at the same time of three batteries to the garrison of the post, and the conversion of Carroll Hall, formerly four sets of officers' quarters, into barracks, have made the continued use of casemates as officers' quarters unavoidable. As is well known, these are wholly unsuited to such a purpose and the construction of six additional sets of officers' quarters is earnestly recommended in order that the use of casemates may be abandoned.

Attention is invited to the very limited space on this reservation available for post purposes. For this reason troops coming here from neighboring posts for their annual artillery target practice have, for several years, been obliged to camp upon ground assigned to the Fort Monroe Arsenal. This was a subject of complaint by the Ordnance Department during the past summer, on the ground that it endangered the safety of valuable public property and buildings pertaining to that department. This and the want of ground for necessary buildings and other purposes have occasioned much embarrassment to the post and present questions which should receive early consideration.

Very respectfully, your obedient servant,

ROYAL T. FRANK,
Lieutenant-Colonel, Second Artillery, Commandant.

ADJUTANT-GENERAL U. S. ARMY,
Washington, D. C.

REPORT OF THE ADJUTANT-GENERAL.

ANNUAL REPORT

OF

THE ADJUTANT-GENERAL.

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
Washington, October 3, 1893.

SIR: I have the honor to submit my annual report for the year ended September 1, 1893.

MILITARY COLLEGES.

An examination of the data in the tabulated statement submitted herewith, compiled from the reports of the officers detailed as professors of military science and tactics at the several institutions enumerated, affords convincing evidence of the steadily increasing favor with which the American people regard an intelligent and judicious blending of military instruction and exercises with the scholastic course of studies. This gratifying growth of popular interest will be best shown by the following comparison of the results of the past scholastic year with those of the two preceding years:

Average number of students over 15 years of age:	
1890-'91	15,717
1891-'92	18,484
1892-'93	21,438
Average number of students under 15 years of age:	
1890-'91	820
1891-'92	710
1892-'93	2,190
Total average attendance:	
1890-'91	16,537
1891-'92	19,194
1892-'93	23,628
Whole number of male students capable of military duty:	
1890-'91	12,301
1891-'92	15,184
1892-'93	17,519
Number required to be enrolled as military students:	
1890-'91	7,487
1891-'92	8,098
1892-'93	8,943
Total number that received military instruction during the last quarter:	
1890-'91	7,366
1891-'92	9,012
1892-'93	10,790

While the above figures show that—as proper in a country which relies, in time of public danger, on its citizen soldiery—the educational centers selected are becoming more and more important factors in insuring the greatest efficiency of that important branch of the military service, the system can only reach its full development when at all

institutions securing a detail the rule is made imperative that every male physically capable shall be enrolled as a military student. In this connection it is noticed that at seven of the colleges enrollment is purely optional, and it is hardly strange, therefore, that at one of the institutions the military professor is constrained to report the interest manifested by the faculty (with one exception) as simply passive.

To further disseminate these benefits it is believed that instruction now provided for colleges should be extended to the "high schools" of our large cities, and it is recommended that legislation authorizing the detail of twenty-five additional officers for the purpose be enacted. The advantages to both the service and the people are too manifest to require argument.

At institutions where the total average attendance of pupils is below 40 and more than one-third of the number is composed of boys under 15 years of age, it would seem evident that, regardless of the ambitious title of the school or of the degree of interest in military duties manifested by both pupils and faculty, the practical benefit resulting from the assignment thereat of a military professor is not at all commensurate with the means afforded.

As the usual length of a collegiate course of studies is four years, there are cogent reasons for fixing that term as the length of the tour of duty of officers detailed as professors of military science and tactics, and I beg to recommend its adoption. It would, moreover, conform to the general rule governing the details of officers on special duty.

Tabulated statement from reports of professors of military science and tactics, showing average attendance of students at universities and colleges.

Universities and colleges.	Average number of students.			Whole number of male students capable of military duty.	Number required by the institution to be enrolled as military students.	Total number that received military instruction during the last quarter.	Attendance at—		Aptitude of students.	Interest manifested by—	
	Over 15 years of age.	Under 15 years of age.	Total.				Artillery drills.	Infantry drills.		Students.	Faculty.
Alabama Agricultural and Mechanical College, Auburn	177	.....	177	174	164	164	16	156	Good	Good	Good.
University of Alabama, Tuscaloosa County	127	.....	127	119	119	103	.....	82	Fair	Fair	Slight.
Arkansas Industrial University, Fayetteville	290	20	310	222	198	274	.....	160	....do	....do	Fair.
University of California, Berkeley	610	.....	610	355	326	326	(*)	249	Excellent...	Excellent.....	Perfectly satisfactory.
Leland Stanford, Jr., University, Menlo Park, Cal	764	.....	764	480	.....	28	(*)	(*)	Not stated..	Growing.....	Same credit given in military course as in other studies.
State Agricultural College, Fort Collins, Colo	89	.....	89	87	.....	79	.....	61	Very good..	Satisfactory	Same as in other departments of the college.
Sheffield Scientific School of Yale University, New Haven, Conn.	529	.....	529	529	110	268	.....	317	Best in United States.	Good	Good.
Delaware College, Newark	78	.....	78	77	(†)	37	20	27	Good	..do	Fair.
Florida State Agricultural College, Lake City	63	4	67	67	67	68	.....	59	Fair	Great.....	Considerable with two or three exceptions.
North Georgia Agricultural College, Dahlonega	59	5	64	59	58	63	14	39	..do	Very fair	Perfect except in the case of the president.
Gordon Institute, Barnesville, Ga	265	100	365	110	(†)	94	16	86	Very good..	All that can be desired.	All that could be desired.
University of Illinois, Champaign	521	.....	521	425	168	168	15	136	Good	Fair and increasing.	Satisfactory.
Knox College, Galesburg, Ill	160	12	172	172	45	83	.....	68	..do	Good	Marked.
Northern Illinois Normal School, Dixon	456	.....	456	400	(†)	137	7	78	Fair	Fair	Fair.
De Pauw University, Greencastle, Ind	800	.....	800	450	162	120	18	89	Good	Excellent.....	Excellent.
Purdue University, Lafayette, Ind	600	.....	600	475	144	158	20	101	Average....	Fair	About the same as in other departments.
Vincennes University, Vincennes, Ind	20	12	32	32	32	32	.....	31	Good	Very good	Good.
Cornell College, Mount Vernon, Iowa	174	.....	174	161	142	142	.....	116	Very good..	....do	Very good.

*Not given.

†Optional.

Tabulated statement from reports of professors of military science and tactics, etc.—Continued.

Universities and colleges.	Average number of students.			Whole number of male students capable of military duty.	Number required by the institution to be enrolled as military students.	Total number that received military instruction during the last quarter.	Attendance at—		Aptitude of students.	Interest manifested by—	
	Over 15 years of age.	Under 15 years of age.	Total.				Artillery drills.	Infantry drills.		Students.	Faculty.
Iowa State University, Iowa City	164	.....	164	146	134	134	21	73	Excellent	Satisfactory	Highly satisfactory.
Iowa Wesleyan University, Mount Pleasant	178	5	183	97	85	85	9	77	Very good	Very good	Very good.
Iowa State Normal School, Cedar Falls	495	.....	495	171	171	171	24	159	Fair	Fairly good	Good.
State Agricultural College, Manhattan	240	3	243	240	(*)	128	18	100	Excellent	Encouraging	Passive by all except the president.
St. John's School, Saline, Kans	35	4	39	30	36	36	39	39	Fair	Fair	Good.
Agricultural and Mechanical College of Kentucky, Lexington.	168	15	183	153	129	129	16	87	Good	Good	Satisfactory.
Central University of Kentucky, Richmond	105	.....	105	90	85	71	(†)	(†)	....do	Not much	Not much.
Louisiana State University and Agricultural and Mechanical College, Baton Rouge.	136	.....	136	135	138	154	.....	130	....do	Good	Not very good.
Maine State College of Agriculture and the Mechanic Arts, Orono.	90	.....	90	100	104	104	.....	75	Very good	Very good	Excellent.
St. John's College, Annapolis, Md	148	20	168	143	138	138	.....	115	Very fair	Satisfactory	Very satisfactory.
Maryland Agricultural College, College Park, Prince George's County.	75	16	91	91	91	87	.....	71	Good	Increasing	Increasing.
Massachusetts Agricultural College, Amherst	121	.....	121	116	121	116	.....	98	Excellent	Very good	Excellent.
Massachusetts Institute of Technology, Boston	1,000	.....	1,000	850	231	237	.....	219	Good	Slight	Slight.
Groton School, Groton, Mass	59	41	100	99	99	93	.....	87	....do	More than fair	Encouraging.
Michigan Military Academy, Orchard Lake	135	.....	135	135	135	135	.....	108	Great	Remarkable	Great.
Michigan Agricultural College, Lansing	235	.....	235	190	(‡)	189	.....	139	Good	Good	Good.
University of Minnesota, Minneapolis	800	.....	800	700	265	138	11	86	....do	....do	Very slight generally.
Agricultural and Mechanical College of the State of Mississippi, Oktibbeha County.	176	5	181	180	181	181	17	41	....do	....do	Excellent.
University of the State of Missouri, Columbia	580	10	590	470	179	150	.....	110	....do	....do	Good.
Washington University, St. Louis, Mo	420	310	730	420	295	325	.....	122	....do	....do	Do.
Missouri Military Academy, Mexico	83	6	89	83	89	89	.....	68	....do	....do	Do.
The College of Montana, Deer Lodge	30	4	34	34	30	37	.....	26	....do	Decided	Much interest manifested.
University of Nebraska, Lincoln	455	5	460	430	227	240	.....	206	Very good	Very good	Good.
State University of Nevada, Reno	135	35	170	61	57	57	6	48	Good	Good	Do.

Rutgers College, New Brunswick, N. J	214	.....	214	200	136	138	.....	132	....do.....	....do.....	Do
Cornell University, Ithaca, N. Y	1,450	.....	1,450	1,260	404	404	17	355	Excellent...	Good and growing.	Favorable.
St. John's College, Fordham, N. Y	170	83	253	232	180	188	.....	107	Very good..	Very good.....	Excellent.
St. John's Military School, Manlius, N. Y	95	5	100	95	100	105	27	93	....do.....	....do.....	Equal to that in other departments.
De La Salle Institute, New York City, N. Y	157	73	230	100	(‡)	199	.....	171	Good	Good	Very marked.
Peekskill Military Academy, Peekskill, N. Y	126	9	135	134	133	133	17	117	Excellent...	Satisfactory	Satisfactory.
Cathedral School of St. Paul, Garden City, Long Island, N. Y.	55	22	77	63	77	77	15	77	Considerable	Lively	Fair.
Bingham School, Asheville, N. C	55	10	65	65	65	65	22	57	Good	Good	Good.
University of North Dakota, Grand Forks	86	2	88	86	88	88	.....	88	....do.....	....do.....	Do
Ohio State University, Columbus	525	15	540	375	267	267	23	160	....do.....	....do.....	Do
Ohio Normal University, Ada	987	28	1,015	639	(§)	355	21	224	Excellent...	Exceptionally great.	Very great.
Ohio Wesleyan University, Delaware	771	.....	771	400	158	158	.....	150	....do.....	Good	Poor, with two or three exceptions.
Mount Union College, Alliance, Ohio	126	.....	126	114	96	96	19	96	Good	Fair	Strong.
Pennsylvania State College, Center County	207	9	216	173	165	165	32	146	....do.....	Great.....	Great.
Allegheny College, Meadville, Pa	174	.....	174	132	97	60	.....	50	Average....	Fair	Good.
Pennsylvania Military Academy, Chester	86	1	87	79	87	87	.....	81	Decided	Well sustained .	Satisfactory.
Grove City College, Grove City, Pa	220	5	225	211	164	208	43	149	Good	Satisfactory	Friendly.
Brown University, Providence, R. I	510	.....	510	400	220	205	17	184	....do.....	Good	Excellent.
South Carolina Military Academy, Charleston	126	.....	126	126	126	126	.....	107	Very good..	High	High.
Patrick Military Institute, Anderson, S. C	87	4	91	91	(‖)	91	.....	78	Good	Good	Good.
Agricultural College of South Dakota, Brookings	110	4	115	70	43	43	.....	37	Fair	Gratifying.....	Fair.
University of Tennessee, Knoxville	175	.....	175	167	101	108	18	93	Good	Good	Good.
Agricultural and Mechanical College of Texas, College Station.	210	5	215	215	211	226	.....	196	....do.....	Excellent.....	Fair.
Austin College, Sherman, Tex	86	8	94	84	94	103	.....	79	....do.....	Great.....	Satisfactory.
University of Utah, Salt Lake City	130	.....	130	125	118	118	8	91	Excellent...	Good	Encouraging.
Agricultural College of Utah, Logan	148	10	158	142	89	82	.....	74	Good	....do.....	Good.
University of Vermont, Burlington	205	.....	205	152	116	116	13	83	....do.....	....do.....	Fair.
Norwich University, Northfield, Vt	56	.....	56	56	56	60	25	44	Excellent...	Excellent.....	Excellent.
Vermont Academy, Saxton's River	142	6	148	74	70	77	.....	66	Fair	Considerable ...	Rather small.
Virginia Agricultural and Mechanical College, Blacksburg.	150	.....	150	155	140	145	18	121	Good	Good	Good.
Virginia Military Institute, Lexington	193	.....	193	193	193	193	36	180	Excellent...	Excellent.....	Excellent.
Danville Military Institute, Danville, Va	45	12	57	57	57	57	.....	46	Fair	Very slight.....	Very satisfactory.
University of Washington, Seattle	45	.....	45	43	43	48	.....	44	Good	Very good.....	Very good.
West Virginia University, Morgantown	170	.....	170	155	74	87	16	81	Very good..	Fair	None.
State University of Wisconsin, Madison	1,100	.....	1,100	800	193	205	.....	174	Excellent...	Good	Satisfactory.
University of Wyoming, Laramie	66	1	67	20	27	34	16	26	Good	Considerable ...	All that could be desired.
Girard College, Philadelphia, Pa	335	1,246	1,581	479	(§)	307	.....	197	....do.....	Excellent.....	Good.

*None. †Not given. ‡Able. §Optional. ‖Not fixed.

MILITARY ACADEMY.

The annual report of the superintendent, which has been submitted to the Secretary of War, and the annual report made to the Secretary of War and to Congress by the Board of Visitors, appointed under the provisions of section 1327, Revised Statutes, to inquire into the actual state of the discipline, instruction, police administration, fiscal affairs, and other concerns of the Academy, exhibit very fully the present condition of the institution in all its departments, and contain numerous suggestions and recommendations for its betterment. Not the least important of these is the recommendation that the number of cadets at West Point be increased beyond its present limit. The recommendation is made by the superintendent that authority be given for appointment at large of one cadet by each Senator of the United States, in which I most heartily concur. I would also recommend that the number of appointments at large by the President be increased so that he should be able to keep at West Point 10 cadets in each class. This would give him authority to appoint 40 instead of 10 as now. I have no doubt that the capacity of the institution would readily admit of this increased number of cadets, and I am so earnest an advocate for military instruction among our people that I can not say too much in favor of the increase recommended.

The items of appropriation recommended by the Board of Visitors have been included in the estimates for the support of the Academy for the fiscal year ending June 30, 1895, and it is hoped that they will receive the approval of the Secretary of War and the favorable action of Congress.

By the act of Congress approved February 1, 1891, making an apportionment of Representatives in Congress among the several States under the Eleventh Census, the maximum number of cadets allowed at the Military Academy after March 3, 1893, was increased from 347 to 371. For the entrance examinations of this year, held on March 1, June 13, and August 28, there were appointed in all 210 principal and 106 alternate cadet candidates. Of this number 94 principals and 12 alternates were found qualified and admitted to the Academy; 67 principals and 39 alternates were rejected as not mentally qualified; 15 principals and 8 alternates were rejected as not physically qualified; 10 principals and 7 alternates were rejected as neither mentally nor physically qualified; 24 principals and 30 alternates failed to report for examination, and 10 qualified alternates failed of admission for the reason that their principals also passed the examinations.

On the 1st of September, when the academic duties commenced, the corps of cadets, exclusive of 3 foreigners receiving instruction under authority of joint resolutions of Congress, numbered 315 members, being 56 less than the maximum number allowed.

THE DIVISION OF MILITARY INFORMATION.

During the past year, the first of actual existence under its reorganization by orders from the War Department, the division of military information has performed work of which the results, though largely confined by their nature to the division itself, have to a measurable extent been given to the Army at large, and, to a much greater extent, utilized by the War Department and by the various staff corps, in obtaining the knowledge necessary for their information regarding the

improvements in war material abroad, the advancement in ideas, and the trend of military affairs in Europe.

The more important military publications of the world have been received and their contents noted and indexed; and various manuscripts submitted to the division have been examined and prepared for publication at the proper time. Many translations have been made from foreign languages, the most extensive, perhaps, being that of a paper prepared by Capt. Moch, of the French artillery, for the congress of engineers at Chicago. Papers or documents in German, French, Spanish, Italian, and Russian, and to some extent in Swedish and Portugese, have been examined as part of the work of an office receiving from the eight representatives of the Army abroad, or who have been abroad, the vast amount of material of a military character current in those countries where military affairs are receiving the greatest amount of attention and development.

Much of this information from Europe has been digested and prepared for the use of the Army and its schools, in accordance with a plan of classification adopted during the year, and some 4,000 index cards constructed relating to progress in the military art, to inventions in arms, equipments, and explosives, to the armed strength of foreign countries, and to their physical condition and resources. To accomplish this work a large number of documents and papers have been examined, for it is a fact that the amount of military literature now published is so vast as to make it practically impossible for the officer of to-day to keep himself informed of that which is valuable without the intervention of an office which collects and sifts the whole.

The largest share of the information received by the office naturally comes through the military attachés abroad, and the importance of their reports depends upon the fact that all really valuable changes and improvements may be noted and brought directly and immediately to the attention of the Secretary of War and the Major-General Commanding the Army. When this section is thoroughly organized it will be the duty of the officer in immediate charge of it to regulate and systematize the efforts of the attachés by pointing out the particular lines of investigation which it may be desired to explore in order that subsequently notes of real interest and military value obtained by this process can be transmitted to the chiefs of the staff departments to which each item of information might more particularly pertain, or be published to the line in annual or semiannual reports of military progress.

This branch of the division may be called "the section of progress in military art." Its work is great and continuous, and requires, besides, thoroughly well-informed officers, assisted by the necessary clerks, sufficient space for the storage of books, papers, and original documents now rapidly accumulating, and facilities for extracting the valuable material from the mass of matter submitted for examination.

The second and third sections of the division have been engaged in the work of collecting information of our own frontiers and regarding our neighbors on the north and south; not, of course, with any unfriendly design towards these neighbors, but because information of the kind collected by this division may be of use to any branch of the Government as well as to the Army. This fact has been well shown by the very general demand from all classes of people for the pamphlet No. 1, on the Hawaiian Islands, published by the division during the year. Similar but more extended reports have been prepared on the Samoan Islands, on Mexico, and Cuba. It is believed that such reports should

be made to cover all countries of this continent and the islands of the West Indies in order that the information regarding the trade relations of these countries, already on hand, may be supplemented by information regarding their military and material resources.

It is evident that materials for this work can best be obtained by assigning selected officers as attachés to legations of the more important Republics of Mexico, Chile, and Brazil, at least, with orders to pursue their investigations under instructions from this section of the military information division.

Under the order of organization the fourth section of the military information division has been exclusively intrusted with all correspondence with State authorities and militia officers "on questions affecting the organization and armament of the militia," and with the preparation of the instructions to the officers detailed by the Secretary of War to visit the several encampments of State troops, and has received, digested, and arranged the reports submitted by such officers. The military information division is now in possession of reports from nearly every State holding an encampment, which are much more valuable than any heretofore received in the War Department.

It has been the aim of this section to arrive at the efficiency and readiness for active service of the militia of the several States, and the officers detailed to visit the camps have been required to direct their observations to that end. Plans for the concentration of the militia forces and estimates of the deficiencies in arms, equipments, and clothing necessary to be supplied for sixty days' service in the field are on hand from many of the States. The printed forms for the consolidation of the information obtained in regard to the efficiency and readiness of the militia for active service have been so carefully devised that hereafter this information will be on file in shape for immediate reference to the War Department authorities at any time it may be needed.

I respectfully invite attention to several valuable reports on subjects of general interest and now on file in this office, and urge that, if at all practicable, they may be printed and distributed to the Army. Many of them I consider extremely valuable, and am convinced that they would be gladly welcomed by the military students in our service.

THE INDIAN AS A SOLDIER.

By General Orders, No. 28, from General Headquarters, dated March 9, 1891, the War Department made provision for the recruitment of eight troops of cavalry and nineteen companies of infantry, to form an Indian contingent as part of the regular military establishment.

Primarily, the scheme was adopted with a view to giving Indians legitimate employment in an appropriate channel, and in the hope that the habits acquired under and enjoined by strict military training would benefit both the individual Indians so enlisted, and, by reflex action, the tribes from which they were drawn; and this object was considered as fully justifying the experiment aside from any purely military considerations.

While every means has been adopted to insure the success of this tentative effort, I am constrained to state my conviction that after two years' trial the experiment has not reached that degree of success that was anticipated, and that I do not believe it will ever be productive of results at all commensurate with the expense.

The whole number of Indians enlisted in the line of the Army up to June 30, 1893, was 963, and the actual number in the ranks at that

date was 771, only 126 enlistments having been made during the last fiscal year. There were at that date six troops of cavalry and nine companies of infantry fully organized. The great difficulty of completing the organization of four additional companies led to the discharge of the Indians enlisted for these companies, and since June 30 it has been found advisable to disband one of the nine companies mentioned above.

Grave and numerous difficulties surround the question of civilizing the Indian tribes in our midst, but it is thought that the placing the several Indian reservations under capable military officers, assisted by intelligent civilians, would be productive of larger and more lasting benefits than the scheme of Indian enlistments.

Young and enthusiastic officers have been selected for the command and management of the several Indian troops and companies, but it is generally conceded that Indians, while prone to adopt the vices of the white soldiers, are slow to acquire their virtues. The lack of knowledge of the English language, a strong repugnance to duty that involves much manual labor, illiteracy, and total unacquaintance with the athletic sports which afford healthy recreation to the white soldiers are formidable obstacles for Indians to surmount within the comparatively short period of their military service.

To station Indian companies at posts near Indian reservations is fruitful of restlessness and discontent by inducing comparison between the free and indolent life on the reservation with the restraints of military life. All Indians marry young, and although ten in each company are recognized as married men and provided accordingly, the other forty odd members must abandon their families during enlistment. Additional hardship is involved by a change of station, for while the War Department has not objected to the wives and children of the men accompanying them, it has insisted that no expense should thereby be entailed upon the Government.

On a careful consideration of the whole subject, I can not resist the conviction of the unadvisability of enlisting Indians in the regular regimental organizations. Indians, when under able command and effective discipline, make excellent skirmishers and scouts, and I am strongly of opinion that their employment as army scouts is the limit of their usefulness to the military establishment.

POST SCHOOLS.

The reports received, while presenting no new or special features of interest, may be accepted as fairly satisfactory considering the means afforded. On this subject I beg again to recommend the introduction of elementary courses of study in topography, minor tactics, and the use of simple field instruments; also, that suitable courses be provided for all enlisted men ambitious to obtain a commission and whose habits and capacity give promise of increased usefulness in the career of their adoption.

The pay and allowances of a private soldier are not enough to induce competent teachers to in this way take up the work, and without teachers that are fully competent good schools can not be had. The present system is a reflection on the high and honorable calling of teachers. At the posts remote from towns there should be teachers equal to those employed in the best public schools. To this end it is recommended that Congress be requested to authorize the enlistment of "post teachers" to the number of one for each military post or station, with the

compensation now given the general service detachments at department headquarters, and that such teachers be in addition to the number of enlisted men now allowed in the Army. By this means we could obtain for this work intelligent and competent men, and at the same time return those now on detached service to their proper duties.

With competent teachers as herein recommended a long-felt want, namely, the primary education of officers' and soldiers' children, will be met. The General Government is, under the circumstances, in duty bound to provide this instruction. It is in keeping with our ideas of wise and just government; in sympathy with the free-school system now so thoroughly established in all our States as to be a marked feature of our people. The teacher everywhere should be regarded with the greatest consideration, no less so in the Army than out of it.

POST LIBRARIES.

Libraries, with an aggregate of upwards of 50,000 volumes, have been established and maintained at over two-thirds of the military posts in the country, and every year valuable works are purchased by the War Department and distributed among the libraries of permanent posts; but, as yet, no provision has been made for the preservation of the books, many being reported as nearly ruined from constant use, and therefore in urgent need of repairs. I beg to call special attention to this important matter, and as the fund from which military books and professional works of reference are purchased is the proper one to sustain the charge for their repair, I have the honor to recommend that, if the contingent fund of the Army be not deemed sufficient for this purpose, Congress be asked to increase it by a specific sum to be applied solely to defraying the expense of needed repairs to the valuable books in the several post libraries.

ARMY REGULATIONS.

Since the adoption and publication of the Army Regulations in 1889 numerous changes have been made therein, resulting from subsequent legislation, incidents of service, or as a spontaneous growth generated under the pressure of surrounding circumstances, but adapted to a living necessity, and therefore it has become more and more evident that a new edition of these Regulations should be prepared, that, leaving out all obsolete matter, would embrace the changes and additions which experience or necessity during the past four years had made necessary.

Fully impressed with the importance of an impersonal compilation, which would avoid the complications, doubts, objections, etc., experience has shown to inevitably attend a code where the individuality of the editor or editors is evident, I convened a board of officers, composed of Col. Henry C. Corbin, Maj. Arthur MacArthur, and Maj. John C. Babcock, officers of my department on duty in this office, to carefully view this important question and submit the general rules which should govern the preparation of a new edition of the code of regulations for the Army. The board, after thoughtful and broad consideration of the subject, submitted the following recommendations:

1. All regulations of 1889 unamended at date of publication to be preserved in their purity and incorporated in the new book. By time and association these paragraphs have acquired a certain fixed meaning and are presumably well understood. To modify or change them without some specific reason is simply to invite the possibility of misunderstanding. They should be inflexibly adhered to, even to the extent of preserving inaccurate punctuation and faulty diction. If in any instance, pending the compilation, occasion arises out of some actual necessity for the modification or change of a paragraph, the amendment should be accomplished

in the usual way, and the result announced in general orders. Amendment under the guise of revision should not be permitted under any circumstances.

2. All amended regulations announced in general orders since the publication of the original text in 1889 to be substituted for the paragraphs amended, the latter to be eliminated. The inflexible rules prescribed for original regulations to obtain in respect of amendments.

3. The laws, general orders, and decisions touching the permanent administration of the Army to be arranged, paragraphed, and inserted. The necessary authority to this end involves a considerable discretion; it can, however, be limited to the minimum by requiring rigid adhesion to original texts wherever it is possible.

These, in my opinion, eminently wise recommendations having been concurred in by the Major-General Commanding the Army, received the approval of the honorable Secretary of War June 29, 1893, and I doubt not, therefore, that in the very near future a code of regulations, revised strictly on the lines indicated by the board, will be ready for publication and distribution to the Army for its information and guidance.

GOVERNMENT HOSPITAL FOR THE INSANE.

The following is a list of the persons committed to the Government Hospital for the Insane under the orders of the honorable the Secretary of War from September 1, 1892, to September 1, 1893:

Officers of the U. S. Army	4
Officers of the U. S. Army (retired)	1
Enlisted men of the U. S. Army	36
Late soldier U. S. Army	1
Total	42

OFFICE WORK.

The legal organization of this office remains the same as at the date of my last report, and its entire clerical force has been actively and usefully employed on work pertaining to the administration of the affairs of the Army, including the recruiting service, and in furnishing information called for, from time to time, by the President, Congress, the several Executive Departments, and the Court of Claims. The appointment, commission, and personal and the regular Army rolls divisions have, in addition to the regular and important duties assigned to them, made numerous reports to the Pension Office, the Auditors of the Treasury, and the several bureaus of the War Department in connection with pension and other claims. The work of these divisions, in this respect, is exhibited in the following table, which, it is noticed with gratification, shows that no call remained unanswered September 1, 1893:

Bureaus.	On hand September 1, 1892.	A. C. P. Division.		Regular Army Rolls Division.		Total.		On hand September 1, 1893.
		Received.	Finished.	Received.	Finished.	Received.	Finished.	
Commissioner of Pensions	.....	414	414	7,383	7,383	7,797	7,797	.....
Second Auditor	.....	319	319	3,652	3,652	3,971	3,971	.....
Third Auditor	.....	5	5	25	25	30	30	.....
Fourth Auditor	.....	2	2	13	13	15	15	.....
Second Comptroller	.....	23	23	23	23	46	46	.....
General Land Office	.....	.....	.....	25	25	25	25	.....
Paymaster-General	.....	8	8	88	88	96	96	.....
Commissary-General	.....	.....	.....	190	190	190	190	.....
Quartermaster-General	.....	6	6	112	112	118	118	.....
Surgeon-General	.....	12	12	300	300	312	312	.....
Miscellaneous	.....	123	123	312	312	435	435	.....
Total	.....	912	912	12,123	12,123	13,035	13,035	.....

During the past year the Confederate Archives Division made, on calls, 2,681 reports to the Department of Justice and to the Court of Claims, 71 to the Pension Office, and 38 on miscellaneous cases. The work of this division is of very great value to the Government by enabling it to expose and defeat many claims presented for settlement, and which, on the examination of the records in the custody of the Confederate Archives Division, are found to be based, in whole or in part, on misrepresentation of facts.

The subdivision reorganized under the law of May 13, 1892, providing "for the preparation of a general card index of the books, muster-rolls, orders, and other papers preserved in the Confederate Archives Office," has prosecuted this special work with much zeal and creditable vigor. Of the clerks employed during the past year in that subdivision, 11 hand been detailed from different divisions of the office and 16 were appointees under the law of May 13, 1892. This total of 27 clerks has been increased, from time to time, by details from the War Records Office, so that the average number employed on this work during the year has been about 33.

The index of the letters received by the Confederate war department was completed in September, 1892, and work commenced in making a card index of the muster rolls of the Confederate army. This has been necessarily a large and tedious work, but a great deal has been done to simplify and systematize it in such a manner as to secure, with the least outlay of time, the largest results in accurate work. There are 1,391 file boxes of these rolls, and the contents of about 865 boxes have been indexed, leaving 526 file boxes of muster rolls yet to be indexed. These rolls, originally filed by States, have been taken up in the same way and indexed in the order shown in the following table, which also shows the approximate number of cards used in card-indexing the names on the rolls of each State:

State.	Number of file boxes of muster rolls.	Approximate number of cards used in the index.
Virginia	213	257,000
Arkansas	70	98,000
Tennessee	140	130,000
Kentucky	24	37,000
Missouri	36	39,000
Alabama	104	110,000
Mississippi	136	115,000
Florida	39	30,000
Maryland	3	4,000
Georgia	100	*100,000
Total	865	920,000

* Only partially indexed.

These cards do not represent the exact number of names on the rolls, for it is impossible, from the condition of many of the rolls and of the papers filed with them, to avoid duplicating a considerable number of the names. As soon as the index of a State is finished it is placed on file for immediate use, and from time to time these different indexes are consolidated in order to minimize the search for any one name.

In addition to the work on the muster-roll index indicated above an index has been made and completed of the letters and letter books of the Confederate adjutant and inspector-general's office and of those of the quartermaster-general's office. Of the former there are on file 30 letter books and about 65,000 letters, to index which required upwards

of 270,000 cards. Of the latter there are 14 letter books and about 12,000 letters, which required some 76,000 cards, making the total number of cards used for this index about 346,000. This work occupied the clerks during the months of April and May, 1893.

Taking the cards thus far used in the index of muster rolls and the number used in the index of letters and letter books mentioned above give a grand total of 1,266,000 cards that have been written, alphabetically arranged, and transferred to the regular files during the year by the clerks of this subdivision.

The completed indexes are of constant service in the Confederate archives division in furnishing information which otherwise would be almost unattainable on account of the time and tedious labor that would be required to examine the original books, rolls, and papers.

I take pleasure in calling your attention to the thoroughly efficient manner in which the officers of the Adjutant-General's Department, both here and elsewhere, as well as the officers of the line on duty in this office, have performed their duties, and in recording my appreciation of the general intelligence, efficiency, and zeal of the clerks of the Adjutant-General's Office.

In closing this, my last annual report, I beg leave to offer my warmest thanks for the invariable courtesy and kindness with which you have treated me both professionally and personally. Under such circumstances the performance of my duties as Adjutant-General has been a sincere pleasure.

Respectfully submitted.

R. WILLIAMS,
Adjutant-General

Hon. DANIEL S. LAMONT,
Secretary of War.

REPORT OF THE ACTING JUDGE-ADVOCATE-GENERAL.

REPORT

OF

THE ACTING JUDGE-ADVOCATE-GENERAL.

WAR DEPARTMENT,
JUDGE-ADVOCATE-GENERAL'S OFFICE,
Washington, D. C., September 28, 1893.

Hon. DANIEL S. LAMONT,
Secretary of War:

SIR: I have the honor to submit the annual report of the Judge-Advocate-General's Department for the year ending August 31, 1893.

Commissioned officers tried by general court-martial—	
Records reported upon and submitted to the Secretary of War for action of the President	3
Records received, revised, and recorded, not requiring the action of the President (acquitted, 1; convicted, 5)	6
Enlisted men tried by general court-martial (convicted, 2,015; acquitted, 162)	2,177
Military convicts tried by general court-martial (convicted)	12
Total trials by general court-martial	2,198
Trials by general court-martial—	
Year ending August 31, 1892	2,226
Year ending August 31, 1893	2,198
Decrease	28
Cases apparently brought before general courts-martial with a view to discharge on proof of five or more prior convictions—	
Year ending August 31, 1892	251
Year ending August 31, 1893	356
Increase over last year	105
Trials for fraudulent enlistment alone—	
Year ending August 31, 1892	0
Year ending August 31, 1893	64
Increase over last year	64
Decrease of trials this year as compared with last, leaving out trials with a view to discharge on proof of prior convictions and trials for fraudulent enlistment	197

Number of convictions of different offences, taken from the records of general courts-martial received at this office during the year ending August 31, 1893:

Sixteenth Article of War—	
Wasting ammunition	1

Seventeenth Article of War—	
Losing clothing	46
Losing Government property	38
Selling clothing	46
Selling Government property	1
Twentieth Article of War—	
Disrespect to commanding officer	15
Twenty-first Article of War—	
Attempting to strike superior officer	3
Disobeying superior officer	86
Twenty-fourth Article of War—	
Disobeying non-commissioned officer quelling a fray	3
Drawing weapon upon non-commissioned officer quelling a fray	1
Thirty-first Article of War—	
Lying out of quarters	4
Thirty-second Article of War—	
Absence without leave	463
Thirty-third Article of War—	
Failure to attend drill, roll call, etc	209
Thirty-eighth Article of War—	
Drunkenness on duty	137
Thirty-ninth Article of War—	
Quitting post	34
Sleeping on post	36
Fortieth Article of War—	
Quitting guard	28
Forty-seventh Article of War—	
Desertion	521
Fifty-first Article of War—	
Advising soldier to desert	2
Fifty-fifth Article of War—	
Destroying private property	2
Sixtieth Article of War—	
Duplication of pay vouchers	2
Embezzlement	6
Forgery	1
Frauds	5
Larceny	16
Selling Government property	2
Sixty-first Article of War—	
Duplication of pay vouchers	2
Sixty-second Article of War—	
Absence without leave, not chargeable under the Thirty-second Article of War	17
Aiding soldier to desert	1
Allowing prisoner to escape	15
Assault	20
Assault and battery	137
Assault with dangerous or deadly weapon	49
Assault with intent to kill	15
Attempt at suicide	1
Attempting to desert	1
Attempting to escape from military prison	1
Breach of arrest	61
Committing a nuisance	20
Disobeying commissioned officer	54
Disobeying non-commissioned officer	221
Disobeying sentinel	6
Disposing of clothing	4
Disrespect to superior officer	53
Drunkenness	205
Drunkenness, etc., causing arrest, etc., by civil authorities	23
Duplication of pay accounts	1
Embezzlement	3
Escaping from guard or arrest	13
Escaping from military prison	9

Sixty-second Article of War—Continued.	
False swearing	3
Fighting	10
Forgery	6
Fraudulent enlistment	89
Indecent exposure of person	3
Insubordinate conduct towards non-commissioned officer	98
Larceny	89
Malingering	6
Neglect of duty	99
Perjury	3
Resisting arrest	62
Selling, losing, or wasting Government property	4
Threatening to strike superior officer	1
Uttering forged paper	4
Disorders, etc., charged as "conduct to the prejudice of good order and military discipline" (not included under previous heads)	572

The following table shows the desertions classified according to the limit of punishment prescribed in the executive order of the President, published in General Orders No. 21, Headquarters of the Army, 1891:

	Number.	Limit of confinement.
Surrendered—		*Months.*
Within thirty days after desertion	31	3
After thirty days, and within ninety days, after desertion	19	6
After ninety days, and having not more than three months' prior service	9	10
After ninety days, and having more than three months' prior service	66	18
After ninety days, having more than three months' prior service, and prior conviction considered	1	30
Apprehended—		
In service less than three months at time of desertion	83	12
In service three months or more, but less than six months	93	18
In service six months or more	213	30
In service six months or more, and prior conviction considered	6	42
Total number of desertions	521	.....
Average limit of confinement	.....	20.78+

Trials for desertion—	
Year ending August 31, 1892	475
Year ending August 31, 1893	521
Increase over last year	46

The number of trials by inferior courts-martial, the number resulting in acquittal, and the number of different men tried, in the different departments, are shown by the following table:

Department of—	Trials.			Acquittals.	Different men tried.
	Garrison.	Summary.	Total.		
Arizona (now Colorado)	45	1,866	1,911	68	1,106
California	20	863	883	26	530
Columbia	14	734	748	15	439
East	28	3,187	3,215	58	1,824
Dakota	40	2,178	2,218	63	1,363
Missouri	27	2,072	2,099	59	1,221
Platte	43	1,736	1,779	50	1,085
Texas	11	923	934	23	599
(At posts not in any of the above departments)	43	1,158	1,201	24	895
Total	271	14,717	14,988	386	9,062

The number of trials by inferior courts-martial for the eleven months ending August 31, 1892, was 16,670, as against 14,988 for the year covered by this report, showing a decrease of probably over 3,000 cases this year as compared with the corresponding period last year.

Attention is invited to the accompanying reports of the judge-advocates of departments, which contain valuable information.

Very respectfully, your obedient servant,

G. NORMAN LIEBER,
Acting Judge-Advocate-General.

REPORT OF MAJ. EDWARD HUNTER, JUDGE-ADVOCATE, U. S. ARMY, JUDGE-ADVOCATE DEPARTMENT OF CALIFORNIA.

HEADQUARTERS, DEPARTMENT OF CALIFORNIA,
OFFICE OF JUDGE-ADVOCATE,
San Francisco, Cal., September 6, 1893.

SIR: I have the honor to submit the following report of the business of this office from September 1, 1892, to and inclusive of August 31, current year:

Number of officers tried by general courts-martial	—
Number of enlisted men	145
(Of this number, 8 men were tried twice, and 2 three times.)	
The offences for which these men were tried were as follows:	
Absence without leave (thirty-second article of war), in connection with other charges in some cases	28
Absence from stables, drills, guard mounting, roll calls, etc	5
Asleep on post	3
Assault	12
Assault with intent to commit rape	1
Conniving at the escape of a prisoner	1
Desertion (in connection with other charges in some cases)*	26
Disobedience of orders of commissioned officers (twenty-first article of war)	3
Disrespect to commissioned officers (twentieth article of war)	1
Disobedience of orders (sixty-second article of war)	3
Drunk on guard	5
Drunk on duty (thirty-eighth article of war)	7
Drunk and disorderly	10
Drunkenness to the prejudice of good order and military discipline (in connection with other charges in some cases)	7
Embezzlement (sixty-second article of war)	1
Fighting and other disturbances	4
Insubordination and abusive language	6
Interference with non-commissioned officers quelling disturbance	1
Larceny	5
Leaving post while on guard	1
Malingering and making false statement	1
Neglect of duty (sixty-second article of war)	8
Selling Government property (sixtieth article of war)	2
Selling clothing (seventeenth article of war)	4
Total	145
No trials have been held by regimental courts.	
The number of trials by garrison courts-martial, on appeal from trial by summary courts, was	20
The number of trials by summary court was	863
The offences for which these men were tried were as follows:	
Absence without leave (thirty-second article of war), in connection with other charges in some cases	346
Absence from roll calls, parades, drills, inspections, etc	179
Abusive, threatening, and obscene language	3
Disobedience of orders and disrespect to non-commissioned officers	46
Drunk on guard	7
Drunk on duty (not under arms)	43
Drunk and disorderly	36

*Includes 8 deserters from organizations in other military departments.

Drunkenness to prejudice of good order and military discipline	56
Fighting and other disturbances	19
Gambling	4
Neglect of duty in connection with other charges	36
Minor offences, "lagging on line of practice march," "having blouse unbuttoned," etc	102
Selling clothing (seventeenth article of war)	6
Total	883

Of the foregoing trials by *summary* and *garrison* courts-martial—

	Men.	Trials.
Tried once	336	336
Tried twice	100	200
Tried three times	51	153
Tried four times	26	104
Tried five times	13	65
Tried six times	3	18
Tried seven times	1	7
Total	530	883

Summary of punishments imposed by general courts-martial.

Amount of forfeitures (in some cases with confinement)	$1,256
Amount of pay detained; to be paid on final statements	$85
Dishonorably discharged, with forfeiture of pay and allowances	32
Dishonorably discharged, with forfeiture of pay and allowances and confinement	35
Number of men dishonorably discharged upon the basis of previous convictions of summary court only	22
Of the general and summary court	7

Summary of punishments imposed by inferior courts-martial.

Amount of forfeitures	$3,052.50
Amount of pay detained; to be paid on final statements	$810.00
Number of days confinement	2,326

Table of recapitulation showing the number of general, garrison, and summary courts-martial cases tried in the department, the garrisons to which such men belong, the number of different men tried, with the percentage of men tried, and comparison with preceding year.

Post.	Average strength of garrison.	Number of trials by—			Number of different men tried.	Per cent men tried.
		General court.	Garrison court.	Summary court.		
Alcatraz Island	115	8	.....	70	51	44.34
Angel Island	295	19	3	188	142	48.13
Benicia Barracks	164	20	3	74	66	40.24
Fort Bidwell	61	2	.....	32	21	34.42
Fort Mason	59	8	3	40	33	55.93
Presidio of San Francisco	531	80	11	453	344	64.78
San Diego Barracks	58	.....	.....	6	6	10.34
Other departments (deserters)	.....	*8	.....	.....	*8	.....
Total	1,283	137	20	863	663	51.67
Convictions	.....	131	17	840	.....	.....
Acquittals	.....	14	3	23	.....	.....
Comparison with annual report, 1891–'92.	1,230	†85	20	1,037	†680	55.28

* Not included in total.

† Thirteen deserters from regiments in other departments tried in Department of California not included in total.

Applications by and for military prisoners for remission of sentence and other official communications relating thereto	120
Official reports received and acted on, inquiries answered, and opinions given.	60

Attention is invited to the fact that there are offences of comparatively frequent commission by soldiers, such as assaults, assaults with a dangerous weapon, nuis-

ances, fraudulent enlistment, absence from check roll calls, absence from school, etc., for which no specific penalties are provided.

Very respectfully, your obedient servant,

EDWARD HUNTER,
Judge-Advocate, U. S. Army.

The ACTING JUDGE-ADVOCATE-GENERAL, U. S. ARMY,
Washington, D. C.

REPORT OF MAJ. S. W. GROESBECK, JUDGE-ADVOCATE, U. S. ARMY, JUDGE-ADVOCATE DEPARTMENT OF THE MISSOURI.

HEADQUARTERS DEPARTMENT OF THE MISSOURI,
Chicago, Ill., September 11, 1893.

SIR: I have the honor to submit the annual report of the business of this office for the year ending August 31, 1893, as follows:

The enlisted strength for the year is 3,298; for the previous year it was 3,393, a decrease of 2.8 + per cent.

GENERAL COURTS-MARTIAL.

Commissioned officers tried 3

The cases are published in General Courts-Martial Orders, Nos. 49 of 1892 and 29 of 1893, these headquarters.

Enlisted men tried 305
Acquittals 14
Number of discharges on citation of previous convictions 49

The offences for which tried are as follows:

For violation of the—		For violation of the—	
Sixteenth article of war	1	Twenty-first article of war	9
Seventeenth article of war	26	Thirty-second article of war	61
Twentieth article of war	1	Thirty-third article of war	22
Thirty-ninth article of war	17	Thirty-eighth article of war	18
Fortieth article of war	6	Sixtieth article of war	11
Forty-seventh article of war	118	Sixty-second article of war	139

Of the number, 118, tried for desertion, 14 were found guilty of absence without leave only, and three were mitigated upon the recommendation of the court. The large increase in the number of trials for desertion, 118 this year against 85 last year, indicates very plainly that the increased reward for the apprehension of this class of criminals is having its expected effect.

The number discharged on citation of previous convictions last year was 47, as against 40 this year.

INFERIOR COURTS.

Trials by summary courts 2,072
Trials by garrison courts-martial 27

Total 2,099
Acquittals 59

Of the number tried by inferior courts, 733 were tried once, 263 twice, 122 three times, 62 four times, 24 five times, 13 six times, and 4 seven times, making the number of different men tried 1,221.

The following table gives the number and percentage of trials by inferior courts at the several posts in the department for the year:

Posts.	Enlisted strength.	Trials by summary court.	Appeals to garrison court.	Cases of acquittal.	Total trials.	Per cent of trials.
Brady	162	49	.....	.....	49	30.24
Leavenworth	679	472	2	16	474	69.66
Mackinac	70	66	.....	1	66	94.28
Reno	351	166	.....	2	166	47.29
Riley	581	436	3	11	439	75.56
Sheridan	602	463	19	8	482	80.06
Sill	344	188	3	16	191	55.52
Supply	256	136	.....	5	136	53.12
Wayne	253	96	.....	.....	96	37.94
Total	3,298	2,072	27	59	2,099	.....

These figures indicate a small decrease in the number of trials by general court-martial, and the gratifying decrease of about 16.48 per cent in the trials by inferior courts, as compared with last year.

The following table gives the average enlisted strength and number of trials by general and inferior courts for the past three years:

Years.	Average enlisted strength.	General court-martial.	Inferior court-martial.
1891	3,004	225	1,958
1892	3,393	322	2,653
1893	3,298	305	2,059

DESERTIONS.

The number of desertions for the fiscal year ending June 30, 1893, and the probable cause therefor as reported by boards of survey appointed to investigate the cases, as required by Army Regulation 118, as amended by General Orders, No. 145, Adjutant-General's Office, 1890, and the posts from which the desertions occurred, are shown in the following tables:

The probable cause.	The year of enlistment.					
	1st.	2d.	3d.	4th.	5th.	Total.
Cause unknown	53	11	2	1	1	68
General dissatisfaction	25	11	1	1	....	38
To escape trial and punishment	10	9	1	1	....	21
Worthless characters	7	4	....	....	....	11
Family affairs, to get married, etc	8	1	....	....	....	9
Drunkenness and effects thereof	3	2	....	1	....	6
Influenced by women	4	....	1	....	....	5
Debts	....	3	....	....	1	4
To better their condition	3	1	....	....	....	4
Persuaded by others	2	1	....	....	....	3
Restless and discontented	1	2	....	....	....	3
Chronic deserters, fear of detection	1	....	1	....	....	2
Enlisted to find shelter for the winter	2	....	....	....	....	2
For the purpose of joining a cattle outfit	....	1	....	....	....	1
To join the Salvation Army	1	....	....	....	....	1
Dishonesty with company money	....	1	....	....	....	1
Enlisted East to get transportation West	1	....	....	....	....	1
Got employment at his home in Canada	1	....	....	....	....	1
Enlisted to get near the World's Fair	....	1	....	....	....	1
Received $9,000 by inheritance	1	....	....	....	....	1
Total	123	48	6	4	2	183

The posts from which the desertions occurred:

Posts.	Strength.	Desertions.	Approximate per cent.
Fort Wayne, Mich	255	2	0.7
Fort Mackinac, Mich	76	1	1.3
Fort Leavenworth, Kans	679	20	2.9
Fort Sill, Okla	350	17	4.8
Fort Reno, Okla	358	18	5.0
Fort Supply, I. T	273	14	5.1
Fort Sheridan, Ill	593	47	7.9
Fort Riley, Kans	570	50	8.7
Fort Brady, Mich	155	14	9.0

Per cent of loss for the department, 5.5 per cent. The number of desertions last year was 146, about 4.3 per cent.

The increase of 1.2 per cent in desertions is, with little doubt, due to the influence of the ten year service law. The older soldiers have resented the spirit of that law and their increased discontent has been communicated to the younger men. This fact was fairly inferable from the first and ought not to be a matter of surprise now.

The soldiers of our Army have no longer a profession which may be confidently entered upon for life, but find themselves in a status closely approximating that of the employé. It is doubtful if the ten year law is in line with good public policy.

There are not wanting those who, while not quick or persistent in expressing their opinions, are yet growing fearful that some recent methods of organization and discipline are hurtful and not helpful. A pause in legislation seems advisable until the actual meaning of the many recent changes can be more carefully measured.

Very respectfully, your obedient servant,

S. W. GROESBECK,
Judge-Advocate U. S. Army.

The ACTING JUDGE-ADVOCATE-GENERAL U. S. ARMY,
Washington, D. C.

REPORT OF CAPT. H. C. CARBAUGH, ACTING JUDGE-ADVOCATE, DEPARTMENT OF DAKOTA.

HEADQUARTERS DEPARTMENT OF DAKOTA,
JUDGE ADVOCATE'S OFFICE,
St. Paul, Minn., August 31, 1893.

SIR: Under the requirements of paragraph 984, Army Regulations, as amended by General Orders No. 19, Adjutant-General's Office, dated March 16, 1892, I have the honor to submit the following report based upon the records of this office for the twelve months ending this date.

During the year two commissioned officers were tried, one at Fort Assinniboine, Mont., the other at Fort Yates, N. Dak. Both were convicted, but only in part of the offenses charged.

In this time 320 trials of enlisted men were had by general court-martial, making in all 322 trials by general court-martial, resulting in 29 acquittals and 293 convictions (with these convictions there was a finding of not guilty of 47 separate offenses). The trials included 654 separate offenses. These were alleged as follows:

Sixteenth article of war	1
Seventeenth article of war—	
Selling clothing	15
Losing clothing	13
Twentieth article of war	8
Twenty-first article of war	25
Twenty-fourth article of war	2
Thirty-first article of war	1
Thirty-second article of war	66
Thirty-third article of war	27
Thirty-eighth article of war—	
Drunk on guard	16
Drunk on stable duty	5
Thirty-ninth article of war	8
Fortieth article of war	4
Forty-seventh article of war, desertion	67
Sixtieth article of war	9
Sixty-first article of war	7
Sixty-second article of war—	
Sentinel, willfully allowing prisoners to escape	1
Sentinel, neglectfully allowing prisoners to escape	1
Abusing horse	2
Forgery	2
Non-commissioned officer, breach of arrest	4
Private, breach of arrest	9
Indecent exposure of person	1
Perjury	3
Committing nuisance	2
Fraudulent enlistment	7
Assault with intent to kill	12
Disorderly conduct near post	19
Disobeying non-commissioned officer	42
Disrespect to non-commissioned officer	37
Absence from fatigue duty	8
Disobeying post orders	4
Introducing liquor in post	3
Drunk at post	16

Sixty-second article of war—Continued.

Disorderly and arrest by civil authorities	8
Disorderly or drunk in post exchange or in quarters	27
Fighting or simple assault	29
Neglect of duty	9
Failing to obey officer and disrespect to	23
False statement to officer or non-commissioned officer	5
Miscellaneous	58
Theft	30
Disobeying and disrespect to non-commissioned officer in charge of prisoners	5
General disorders by prisoners	9
Sentinel, neglect of duty	4
Total	654

The number of records of garrison courts-martial and the reports of summary courts which have been received and filed in this office is as follows:

Garrison courts-martial	40
Summary courts	2,178
Total	2,218

These cases included 1,363 different men and 3,018 separate offenses, as follows:

Offenses.	Garrison.	Summary.
Absent from one to six hours	1	141
Absent from six to twelve hours		101
Absent from twelve to twenty-four hours	1	143
Absent from twenty-four to forty-eight hours		18
Absent two days and over		23
Absent from drill	1	141
Absent from dress parade		30
Absent from extra duty	1	74
Absent from guard detail		39
Absent from fatigue duty	4	71
Absent from inspection		31
Absent from inspection (of quarters)		324
Absent from reveille and retreat		198
Absent from school		10
Absent from stables	1	112
Absent from target practice		8
Private breaking arrest		29
Committing nuisance in quarters	1	31
Creating a disturbance		7
Dirty condition of guns, accouterments, etc	3	59
Disobedience of orders	7	21
Disrespect to superior officer	1	17
Gambling	3	37
Disrespect to and disobedience of orders of non-commissioned officers	11	260
Drunk or disorderly in quarters		165
Drunk on daily or extra duty		23
Drunk at drill		22
Drunk at guard detail		13
Drunk at weekly inspection		8
Drunk on parade	1	12
Drunk at retreat		4
Drunk at post	5	169
Drunk at stables	1	10
False statement to superior officer	2	27
Fighting, assault	2	78
Introducing liquor into quarters		19
Miscellaneous	8	339
Neglect of duty	7	63
Sentinel, neglect of duty		27
Abusing horse	1	19
Losing or selling clothing		10
Arrest by civil authorities		17
Quitting guard		4
Resisting arrest		4
Total	58	2,960

During the year (1890) just preceding the issuance of General Orders, No. 21, Adjutant-General's Office, of 1891, which prescribes for certain offenses therein named, limits of punishments, based on the use of records of previous trials and convictions, it appears that 8,094 different men were tried in the Army by inferior courts, in all 11,574 times. It also appears that, in 1892, 9,603 different men were in like manner

tried, in all, 16,670 times. I believe the records for this year will show a slight per cent of increase in such trials. Under the most favorable view it appears that if a man were, previous to the issuance of the order referred to, tried five times he would now be tried about seven times, the increased number being due to the summary method of trial.

A new condition of affairs has therefore been brought about in the military service, by the new system. Disciplinary punishments, executive management, discretion, and tact have been supplanted to a certain extent by the easier and more exact method of taking official recognition of delinquencies by the summary court.

Under these conditions a man prone to offend increases the number of his trials much more rapidly than even the figures given above indicate.

During the year, 65 sentences of dishonorable discharge through use of previous convictions have been executed in this Department. In about half these cases the sentence permissible to the court was either dishonorable discharge with forfeiture of pay and allowances, or a punishment less than the limit of sentence allowed to a summary court.

Under existing circumstances, I do not believe five previous convictions by a summary court furnish either an accurate guide to a man's usefulness as a soldier, or conclusive proof of his incorrigibility. The result is that the record of previous convictions becomes to the court an easy method of determining upon a sentence, and furnishes an excuse rather than a reason for discharge. The court, in many cases, discharges the man on account of the knowledge the members have of him, or because no approximately adequate sentence is permissible, while the record of the judicial tribunal gives as the reason that evidence of five or six previous convictions by summary court shows him to be worthless as a soldier. I believe that a record of five previous convictions justifies a reasonable disciplinary sentence on conviction of minor offenses, for instance, about three months confinement and forfeiture of pay for the same period instead of the alternatives to which the court is now limited, but that now it does not justify dishonorable discharge, hence it is recommended that this alternative punishment now authorized, where evidence of exactly five previous convictions is admitted, be superseded by the suggested disciplinary punishment as a limit in such cases.

Even at this late day, over two years since the issuance of the rules as to the use of evidence of previous convictions, I am satisfied that the regulations governing their use are not enforced in over one-third of the army. Some company commanders submit the record, others do so only at times for various reasons, but a great portion of the army to-day has a system of fixing limits of punishments whereby company and post commanders and summary courts determine the limit of punishment by withholding, submitting, or considering at will the record of previous convictions, thus resulting in lack of uniform punishment for the same offense; for instance, during the year in this department a general court-martial expressed regret that a more severe punishment than was adjudged was not permissible, when in fact there were existing previous convictions which, if submitted in accordance with the regulations, would have fixed a greater limit than that open to the court.

The punishments for many offenses being small, company commanders have sometimes resorted to what might be called double charging, whereby a charge of absence without leave for about eighteen hours was accompanied by additional specifications covering the intervening and usual garrison or post duties. To correct these two evils the following positive directions were issued on May 31, 1893, from these headquarters:

"With a view to uniformly enforcing the regulations as to court-martial practice, the following will hereafter govern in this department:

"First. In each case tried by summary, garrison, or regimental court, all previous convictions in the current enlistment and within two years will be submitted or cited to the court, and the record of the court will show the number of previous convictions admitted in evidence.

"Second. Post commanders, in forwarding charges to these headquarters, will, in addition to the indorsement required by paragraph 2, General Orders No. 1, series of 1887, from these headquarters, state 'there are in this case only (so many) previous convictions in the current enlistment and within two years.'

"Third. Post commanders will state upon the monthly transcript of the summary court forwarded whether 'all previous convictions in the current enlistment and within two years were in each case submitted or cited to the court.'

"Fourth. All charges in which there are five or more previous convictions in the current enlistment and within two years will be forwarded with recommendation as to trial to these headquarters for action.

"Fifth. In charges for a definite absence without leave in violation of the thirty-second article of war, the included and usual daily post and company duties will not be separately and in addition charged under the thirty-third article of war."

The fourth paragraph of these instructions is intended to take from the summary

court, as far as possible, cases being sent before it in which the limit of punishment is often a more severe penalty than is now authorized for a summary court to administer and where always the alternative of dishonorable discharge was administratively ruled out by trial before such a court.

In some of these cases post commanders now recommend that trial by summary court be allowed. On the ground that a department commander must ultimately decide whether he will approve a sentence of dishonorable discharge in the event of a finding of guilty, such cases have sometimes been so tried; but this method, though a much better one than withholding an existing record of previous convictions, is not a satisfactory one, for there is a lack of uniformity in recommendations. Another reason against such practice exists in this, that if the summary court can take cognizance of such cases then under its mandatory language it is difficult to say where its jurisdiction ends.

The general view, and it appears to be a sound military view, with post commanders is, as it was with the garrison court, that the ends sought in maintaining discipline ought to give them the right to use the minor court even though its punishing power does not extend to the limit authorized for the charges. The power of adjudging the disciplinary sentence suggested, on proof of exactly five previous convictions, would do much towards remedying existing inexactness in practice. I believe there is too much importance given to records of previous convictions in the system of punishments established by the general order covering their use, and too little to the offense. A jump from a given punishment to three times that amount on proof of four previous convictions, with intermediate limits for lesser numbers, is a detraction from and a limitation upon the judicial discretion of a court martial.

Rather fix the limit to three times that now allowed and let the effect of the record be a matter of discretion, then, if the record is administratively withheld there can be no effects upon the powers of the tribunal.

Such limitations find their basis in the sentiment that the sentence of a court-martial is little more than a recommendation and in a belief that the court lacks discretion in adjudging sentences. This is an administrative view of a court. The statute makes a court-martial a judicial tribunal, and its true functions are more nearly reached by preserving and inculcating in officers a due regard for its nature as such.

Returning to the subject which has called forth these remarks I do not believe that the true rule in the use of previous convictions will be reached until only the maximum limit of punishment for offenses be prescribed, and that at every trial in the military service when it becomes the duty of a court to adjudge a sentence that such record shall be submitted to enable the court to determine if it should deal leniently with the person convicted. Provided that on proof of six or more convictions dishonorable discharge with forfeiture of pay and allowances may be added to the confinement authorized.

The system of punishments would thus become simple enough for use in the field. We now have a system of trials for peace and another for war, and a code of punishment that can not be administered without the use of a file of orders and records; hence, it is too technical and complicated for all conditions of the service. Something must be left to the judgment of officers, if failures to exercise sound judgment sometimes occur.

When the total punishment authorized upon conviction amounts, with or without the use of a record of previous convictions, to about ten months' confinement with forfeiture of pay for the same period, dishonorable discharge with forfeiture of all pay and allowances, with confinement for about six months, should be permitted.

It seems to me that desertion should never, by punishment, be a less offense than absence without leave; hence, the punishment should always include dishonorable discharge. It is better to pardon the offense than to permit for it only minor punishments.

In connection with this it should be noted that a hospital steward, or other staff non commissioned officer, who deserts and surrenders within three months, can not be reduced in grade either by sentence or by the rules applicable to non-commissioned officers of the line; neither can he be dishonorably discharged. This anomaly, in one case, was only avoided by the absence being more than ninety days. It is a defect which could be remedied by allowing dishonorable discharge in all cases of desertion.

Owing to the lapse of appropriation for the pay of the Army, pay detained by sentences becomes uncertain as to ultimate payment; hence, as it is not an important kind of sentence, its use could well be discontinued as being, in general, impracticable.

As to existing military tribunals, I have in a previous report stated that the failures of the law organizing the summary court, namely, to definitely fix its jurisdiction, as is done for the field officer's court in the eightieth article of war, by kind

of offense; to limit its punishing power; to make it applicable in war; to secure a court in isolated posts and detachments where most needed; to permit anyone but the second officer in rank to act, except a post commander in certain cases, and to give the right to compel the attendance of witnesses, all warrant its being superseded by a revision of the eightieth article of war so as to create a court applicable alike in peace or in war.

The failure to supply a statutory method of punishing for the commander of a detachment, when he is the only line officer present with the command, is at once derogatory to his position and forces him to the indefinite and uncertain method of using disciplinary punishments, when he should have the statutory right to enforce discipline at the very time when discipline is of some consequence. Posts are simply administrative and instruction depots, yet laws are frequently framed as though the post was the aim and end of military existence and operations.

The summary court is but an administrative organ. In many cases we find from five to thirteen officers taking an oath to the proper performance of their duties in determining guilt or innocence, while probably but the day before one of them as a summary court tried a more serious offense without the solemnity of such an oath. One officer without an oath is not so reliable as possibly thirteen officers, including himself, who have taken an oath.

The eightieth article of war should be amended to read, "The commanding officer of a post, regiment, or separate detachment may try, or detail an officer who under an oath to be administered by said commander may try, soldiers of the command for offenses not capital." To this a proviso could be added, as follows: "In time of peace upon a demand of removal the case shall be tried by a regimental or garrison court-martial, provided a sufficient number of commissioned officers to form such a court are present for duty with the command," though such a proviso would be a concession to sentiment rather than to any necessity. The existence of this court would enable the commanding officer, in his discretion, to send cases before the garrison or regimental court, where by not recording the evidence (and there is no necessity to record the evidence) an equally summary method of trial could be had, accompanied by proper prosecution, by the benefits of counsel, by the sanction of an oath, and by which exact justice would be secured.

Of the number of cases tried by summary court in but a small per cent is the issue of innocence raised. During the month of July in this department of 193 cases so tried in but 33 was the plea of "not guilty" in whole or in part made. In August there were 20 pleas of "not guilty" in 135 trials. Cases of acknowledged guilt are especially appropriate for adjudging of penalties by company commanders or by other administrative methods, but where the issue of innocence is raised the method of trial by garrison court, before referred to, seems more appropriate, and should not be superseded unless it be by a summary court which is judicial.

In only about one out of six minor cases is a plea of "not guilty" made. When it is remembered that it is of these cases only that there are demands of removal made, it appears that the per cent of removal is quite large; hence, all such cases could be tried by garrison court.

The amendment mentioned would complete a military system of tribunals applicable alike for detachments, posts, field service, or time of war; would avoid the anomaly of the most unimportant court being clothed with the appearance, at least, of greatest reliability, and would give to young officers greater opportunity of sitting with older ones in trials and of acting as prosecutor and counsel, thus educating them to the more important duties of trying serious offenses.

Already this lack of experience is being felt when judge advocates of general courts are about to be selected. Under the old system a young officer in a comparatively short time acquired considerable experience in trials of minor cases. Under the present, this lack of experience becomes obvious. Though an advocate of summary trials, I am forced to the conclusion that our present system is not a consistent one, and that another step must be taken before the system of trials is within the limit of sound military and judicial methods.

The time has come, I believe, for a new codification and reënactment of the articles of war whereby, without the use of experimental legislation, military methods in trials and sentences could be improved.

In addition to what has before been said as to desertion, it may be added that during the year ending July 30, 1893, there were 313 desertions from the organizations serving in this department. Of these, 45 were apprehended and only 5 surrendered. Of the total number, 190 had never been tried, 53 once, 31 twice, 17 three times, 8 four times, 13 five times or oftener; from which it will be seen that trials by court-martial have little or nothing to do with desertions. The leniency shown in General Order No. 21 to those who surrender, is not appreciated and does not lead to surrenders.

This office is charged with the keeping of the special reports rendered under paragraph 117, A. R., on each deserter; from these reports it appears that individual

restlessness and unreliability—not chargeable to defects in the military service—are the principal elements to be overcome in order to reduce desertion. Better choice of material and certainity of arrest, coupled with adequate punishment, seem to be required. This appears to be emphasized by the facts that 1,290 recruits were added to the organizations serving in this department during the year, that there has been but one reënlistment, and that during this time these organizations lost through desertion, dishonorable discharge, and discharge without honor about 450 men. Of these 313 deserters, 40 served less than three months, 90 from three to six months, 58 from six to nine months, 42 from nine to twelve months, 48 from twelve to twenty-four months, and 26 over two years.

Very respectfully,

H. C. CARBAUGH,
Acting Judge-Advocate.

The JUDGE-ADVOCATE-GENERAL, U. S. ARMY,
Washington, D. C.

REPORT OF CAPT. C. McCLURE, ACTING JUDGE-ADVOCATE, DEPARTMENT OF THE COLUMBIA

HEADQUARTERS DEPARTMENT OF THE COLUMBIA,
JUDGE-ADVOCATE'S OFFICE,
Vancouver Barracks, Wash., September 9, 1893.

SIR: Pursuant to the provisions of paragraph 984, Army Regulations, as amended by General Orders No. 19, Adjutant-General's Office, series of 1892, I have the honor to submit the following report for the year ending August 31, 1893.

The appendices herewith, which are made a part of this report, are as follows: general courts-martial, A; inferior courts-martial, B; desertions, C.

GENERAL COURTS-MARTIAL.

The number of trials had by general courts-martial is 98, as against 94 last year. As the report of last year covered but eleven months, it may be considered that there has been a decrease this year in the number of trials.

INFERIOR COURTS-MARTIAL.

The number of trials had by summary courts is 734; by garrison courts-martial, 14; total, 748, as against 872 last year (eleven months), and 1,298 the preceding year. The decrease is encouraging, but it should be greater.

I renew the following recommendation, contained under this head in my report of last year, to wit:

"Another means of avoiding too many trials by the summary court would be afforded by permitting company, troop, and battery commanders, in their discretion and acting under the direction and control of commanding officers, to require soldiers guilty of minor offenses, for which only slight punishments are authorized, to elect between a trial by court-martial and a specified number of extra tours of company, troop, or battery fatigue duty.

"An official sanction by the War Department of such a practice would, in my opinion, soon cause a marvelous reduction in the number of trials by the summary court, and would be authorizing and regulating, in time of peace, a practice which will of necessity find constant application in time of war."

DESERTIONS.

The number of desertions during the year is 122, as against 55 last year (eleven months), showing an increase of 67.

The boards of survey appointed to ascertain the causes which induced the desertions reported that in 69 cases no cause could be ascertained, while in 4 cases the desertions were attributed to the ten-year act.

The number of men who deserted in the first year of enlistment is 71; in the second, 37; giving a total of 108. The corresponding figures for last year—eleven months—are 32 and 5; total, 37.

The number of desertions in March, April, May, and June were, respectively 11, 18, 25, and 17; total, 74; same during corresponding months last year, 9, 4, 8, and 8; total, 29.

As the ten-year act, prohibiting the reënlistment of privates after ten years' service, approved February 27, 1893, was published to the Army March 11, following, and as this act essentially changed the conditions upon which enlistments had theretofore been made, the above figures would seem to justify the conclusion that the marked increase in the number of desertions was primarily the effect of the enactment of this law.

If there has been a similar increase in the other military departments, it will demonstrate that with the enlisted men the prospect of being placed upon the retired list, even after thirty years' service, is an incentive to bring and keep them in the service which heretofore has not been fully appreciated.

It is to be hoped that the law in question will be speedily repealed.

PREVIOUS CONVICTIONS.

The number of men dishonorably discharged by sentence of a general court-martial is 43 out of 90 tried this year as against 42 out of 86 tried last year. Twenty-seven were convicted of desertion as against 13 last year; 20 of the 27 were dishonorably discharged. Only 6 of the 90 men were tried more than once by general court-martial; and 5 of the 6 were tried twice each. Evidence of previous convictions—5 or more—was submitted in 20 cases. One man, still in the service, was tried 4 times by general court-martial, and in each trial, 5 or more previous convictions were cited against him. In 10 of the remaining 16 cases dishonorable discharge was adjudged; in 9 of the 10 cases the discharges were for minor offenses on account of previous convictions, and hence without confinement at hard labor.

The experience of the past year has not caused me to materially change the views submitted under this head in my report of last year.

I beg leave, therefore, to invite attention to those views, and especially to the following "conclusions" therein set forth, to wit:

"(2) While courts-martial should have power to discharge from the service men who persistently defy the requirements of discipline, as evidenced by previous convictions, yet to deter those who would enter upon a line of bad conduct to invoke such penalty, said courts should have power to add, in all cases, some confinement at hard labor to dishonorable discharge.

"(3) Five previous convictions should not sustain a sentence of dishonorable discharge unless at least one by general court-martial is included.

"(4) In every trial by general court-martial, after a finding of guilty, where a discretionary punishment is authorized, evidence, if any, of all previous convictions had within a prescribed period should be required to be submitted to the court to aid it in determining upon its sentence. Where the prescribed limit of punishment is such that it should not be increased by reason of previous convictions, they should be considered in determining whether that limit should be imposed."

EMBEZZLEMENT OF FUNDS NOT PUBLIC.

During the past year a creditor of one of the post exchanges in this department established to the satisfaction of the proper authorities that a paper purporting to be a receipt, which the post exchange officer had submitted as evidence of payment of the creditor, was a forgery, and thereupon the debt was ordered paid; this time from the funds of the company and hospital corps detachment which were at the post at the time the debt was contracted.

The post exchange officer, before the discovery of the embezzlement, was tried on other charges in another department and sentenced to be dismissed.

There was time, I believe, to have tried him for the embezzlement, and such trial would doubtless have been recommended and ordered, if his accrued and accruing pay could legally have been reached to reimburse the funds which had made good his embezzlement.

This case suggests very forcibly the propriety of a law giving to general courts-martial the power to adjudge a stoppage against the pay, due or to become due, of officers or enlisted men convicted of embezzlement of company, band, post exchange, or similar funds to reimburse as far as possible the loss to said funds.

Very respectfully, your obedient servant,

CHARLES MCCLURE,
Captain and Acting Judge-Advocate.

The ACTING JUDGE-ADVOCATE-GENERAL U. S. ARMY,
Washington, D. C.

APPENDIX A.

GENERAL COURTS-MARTIAL.

Number of general court-martial records received, revised, recorded, and forwarded to the Acting Judge-Advocate General during the year ending August 31, 1893: Ninety-eight (98) cases of enlisted men.

Convictions	91
Acquittals	7
Total cases	98

Comparison of total number with that of two previous years:

Cases tried 1890–'91	130
Cases tried 1891–'92*	94
Cases tried 1892–'93	98
Increase from last year	4

	Men.	Cases.
Tried once	84	84
Tried twice	5	10
Tried four times	1	4
Total	90	98

One officer of the Fourth Infantry tried during the year.

Distribution of cases tried by general courts among the different military posts of the department.

Post.	Cases tried at post.	Of men belonging to post.	Of men belonging to other posts.	Of men belonging to other departments.	Men of post tried at other posts.	Total number of men of post tried.	Average strength of garrison.	Per cent.	Per cent last year.
Boise Barracks	.....	.....	.....	.....	9	9	109	8.2	5.0
Fort Canby	.....	.....	.....	.....	1	1	106	.9	6.7
Fort Sherman	35	11	21	3	2	13	278	4.7	11.8
Fort Spokane	.....	.....	.....	.....	10	10	181	5.5	1.7
Fort Townsend	.....	.....	.....	.....	8	8	62	12.9	1.5
Vancouver Barracks	55	23	26	6	2	25	421	5.9	5.9
Fort Walla Walla	8	4	4	.....	19	23	205	11.2	5.5
Total and average	98	38	51	9	51	85	1,362	6.2	6.4

*Eleven months.

Classification of offenses tried by general courts in the department for the year ending August 31, 1893, and comparison of number of cases tried for desertion with that of previous year, etc.

Offense.	Finding, guilty.	Finding, not guilty.	Total.
Selling or losing clothing, article 17	8	.....	8
Disrespect to his commanding officer, article 20	1	1	2
Disobedience of orders, article 21	3	4	7
Lying out of quarters, article 31	1	.....	1
Absence without leave, article 32	13	.....	13
Absence from roll calls, etc., article 33	5	.....	5
Drunk on duty, article 38	12	1	13
Leaving or sleeping on post, article 39	4	.....	4
Quitting guard without leave, article 40	1	.....	1
Desertion, article 47	27	5	32
Advising to desert, article 51	1	.....	1
Stealing Government property, article 60	4	3	7
Entering into agreement to defraud United States, article 60	.....	1	1
Disorders charged as "conduct to the prejudice of good order and military discipline," article 62	47	11	58
Total offenses	127	26	153

Convictions of desertion	27
Convicted of absence without leave, charge desertion	5
Cases tried for desertion—	
1892–'93	32
1891–'92	14
Trials for desertion this year more than last	18
Men dishonorably discharged by sentence of general court-martial	43
Same, last year	42
Trials in which evidence of previous convictions was introduced	21
Same, last year	30
Non-commissioned officers reduced to the ranks by sentence of general court-martial	3

Table exhibiting the organization to which the enlisted men tried by general courts belong.

Organization.	Band.	A.	B.	C.	D.	E.	F.	G.	H.	I.	L.	Total.
Fourth Cavalry	1	4	.....	.....	9	1	3	2	5	.....	5	30
Fifth Artillery	.....	.....	1	1	.....	.....	.....	.....	1	.....	.....	3
Fourth Infantry	.....	3	4	5	1	3	2	2	2	.....	.....	22
Fourteenth Infantry	1	5	4	3	5	3	2	1	.....	.....	.....	24
Twentieth Infantry	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	2
Twenty-first Infantry	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	2
Twenty-second Infantry	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1
Twenty-fifth Infantry	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1
United States Military Academy detachment of cavalry	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Hospital Corps	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
Total number of men tried	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90

APPENDIX B.

INFERIOR COURTS-MARTIAL.

Garrison courts-martial.

Cases tried by garrison courts-martial during the year ending August 31, 1893	14
Men tried	14

Convictions	12
Acquittals	2
Total cases	14
Removals to garrison courts-martial upon request of accused	14
Investigation by regimental court-martial	1

Summary courts.

Cases tried by summary courts during the year ending August 31, 1893	734
Men tried	425
Convictions	721
Acquittals	13
Total cases	734
Sentences disapproved	2
Sentences remitted	7
Sentences partially remitted	2
Non-commissioned officers reduced to the ranks by sentence of inferior court	7
Forfeitures imposed and executed	$2,075.25
Days confinement at hard labor	3,052
Days solitary confinement on bread-and-water diet	48
Pay detained, to be paid on final statements	$1,468.00

Distribution of cases tried by inferior courts, with number confined and released without trial, at the posts of the department.

Post.	Average strength of garrison.	Cases tried.		Men tried.	Per cent men tried.	Confined and released without trial.
		Summary.	Garrison.			
Boise Barracks	109	51	3	40	36.7	1
Fort Canby	106	67	.....	38	35.8	3
Fort Sherman*	278	168	1	90	32.4	2
Fort Spokane†	181	80	4	64	35.4	3
Fort Townsend	62	39	.....	29	46.8	11
Vancouver Barracks	421	170	6	108	25.7	29
Fort Walla Walla	205	159	.....	78	38.0	4
Total and average	1,362	734	14	‡447	32.2	53

*Two cases of men belonging to this command tried at camp at Wallace, Idaho, during September 1892, included.

†Twenty-eight cases of men belonging to this command tried at camps at Wallace and Wardner, Idaho, during September, 1892, included.

‡Five men of Company A, Fourteenth Infantry, tried first at Fort Townsend, and, after change of station, again at Vancouver Barracks; three men of Company F, Fourteenth Infantry, tried first at Vancouver Barracks, and, after change of station, again at Fort Townsend; total number of different men tried, 439.

Number of summary court cases, 1892–'93	734
Number of garrison court cases, 1892–'93	14
Number of cases tried by inferior courts	748
Number tried last year*	872
Decrease from last year	124

*Eleven months.

Distribution of cases and men tried by inferior courts among the different organizations serving in the department.

Organization.	Trials.	Band.	A.	B.	C.	D.	E.	F.	G.	H.	I.	L.	Total.
Fourth Calvary	Cases	15	41	....	....	48	9	29	27	33	....	19	221
	Men	9	17	....	....	23	8	20	18	21	....	6	122
Fifth Artillery	Cases	.....	39	....	27	....	....	....	....	....	....	....	66
	Men	.....	21	....	16	....	....	....	....	....	....	....	37
Fourth Infantry	Cases	2	15	27	24	30	15	34	32	62	8	....	249
	Men	2	10	21	19	21	12	17	24	23	5	....	154
Fourteenth Infantry	Cases	2	55	14	32	27	20	31	17	....	....	....	198
	Men	1	28	10	17	14	13	22	12	....	....	....	117
Hospital Corps	Cases	.....	....	....	....	....	....	....	....	....	....	....	14
	Men	.....	....	....	....	....	....	....	....	....	....	....	9
Total	Cases	.....	....	....	....	....	....	....	....	....	....	....	748
	Men	.....	....	....	....	....	....	....	....	....	....	....	439

NOTE.—Troops, batteries, and companies showing no trials in above table are not serving in the department.

Number of times tried by inferior courts.

	Men.	Cases.
Tried once	260	260
Tried twice	106	212
Tried three times	36	108
Tried four times	24	96
Tried five times	11	55
Tried six times	1	6
Tried eleven times	1	11
Total	439	748

Classification of offenses tried by inferior courts.

Selling or losing clothing (laid under article 17)	14
Disrespect to his commanding officer (laid under article 20)	2
Using reproachful speech (laid under article 25)	1
Lying out of quarters (laid under article 31)	5
Absence without leave (laid under article 32)	243
Absence from roll calls, etc. (laid under article 33)	240
Drunk on duty (laid under article 38)	51
Quitting guard without leave (laid under article 40)	1
Disorders charged as "conduct to the prejudice of good order and military discipline" (laid under article 62)	342
Total number of offenses	899

APPENDIX C.

DESERTIONS.

Number of desertions during the year ending August 31, 1893	122
Number reported last year	55
Increase from last year	67

Causes, etc., of desertions, ascertained under the provisions of paragraph 117, Army Regulations, and comparison with same data for three preceding years.

Year.	Character, as set forth in reports of boards of survey.							Causes of desertion—Opinions given in reports of boards of survey.										Nativity.	
	Excellent.	Good.	Fair.	Bad.	Worthless.	Not formed.	Not ascertained.	Dissatisfaction with service.	Fraudulent enlistment.	Roving disposition.	To escape court-martial.	To escape consequences of crime.	Ten-year act.	Debts, unable to pay.	Domestic relations.	Refusal of furlough.	Enlisted for transportation.	American.	Foreign.
1892–'93	2	76	24	8	8	4	69	23	2	7	5	4	4	4	1	2	1	79	43
1891–'92	3	27	11	9	....	5	16	14	....	4	3	.....	.....	6	2	.....	.....	39	16
1890–'91	6	51	22	13	9	5	38	18	....	6	5	.....	.....	5	1	.....	.....	57	49
1889–'90	7	46	20	8	10	....	36	11	....	....	15	....	....	5	4	....	....	50	41

Year.	Number tried by courts-martial and number of trials.				Length of service.						Months in which desertions occurred.											
		Inferior courts.									1892.					1893.						
	General courts.	Tried once.	Tried more than once.	Not tried.	Less than 1 year.	Between 1 and 2 years.	Between 2 and 3 years.	Between 3 and 4 years.	Between 4 and 5 years.	Over 5 years' service.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.
1892–'93	1	17	21	83	71	37	5	2	1	6	2	4	8	4	6	4	6	14	18	25	17	7	7
1891–'92	...	5	17	33	32	5	7	3	....	8	...	5	5	3	1	3	2	9	4	8	8	5	2
1890–'91	4	18	34	54	41	33	20	1	....	11	...	12	9	11	12	1	1	5	3	16	10	17	9
1889–'90	5	20	16	53	49	11	11	3	1	16	...	12	5	4	1	...	6	11	13	16	9	7	7

Distribution of cases of desertion among the different military posts of the department.

Post.	Average strength of garrison.	Number of desertions.	Per cent.
Boise Barracks	109	13	11.9
Fort Canby	106	16	15.1
Fort Sherman	278	21	7.6
Fort Spokane	181	*19	10.5
Fort Townsend	62	12	19.4
Vancouver Barracks	421	32	7.6
Fort Walla Walla	205	9	4.4
Total and average	1,362	122	8.9

*One desertion from camp at Wardner, Idaho, included.

Distribution of cases of desertion among the different organizations serving in the department.

Organization.	Band.	A.	B.	C.	D.	E.	F.	G.	H.	I.	L.	Total.	Average strength of organization.	Per cent.
Fourth Cavalry	1	1	(*)	(*)	1	4	8	2	3	(*)	3	23	353	6.5
Fifth Artillery	(*)	6	(*)	10	(*)	(*)	(*)	(*)	(*)	(*)	(*)	16	106	15.1
Fourth Infantry	†1	5	9	5	1	4	5	....	7	6	....	43	433	9.9
Fourteenth Infantry	1	6	9	3	5	3	10	2	(*)	....	....	39	408	9.6
Non-commissioned staff	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	.....
Hospital Corps	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	43	2.3
Total and average	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	122	1,362	8.9

*Not serving in the department. † Unassigned.

REPORT OF CAPT. E. H. CROWDER, ACTING JUDGE-ADVOCATE, DEPARTMENT OF THE PLATTE.

HEADQUARTERS DEPARTMENT OF THE PLATTE,
JUDGE-ADVOCATE'S OFFICE,
Omaha, Nebr., August 31, 1893.

SIR: Under the requirements of Army Regulations, 984, as amended by General Orders No. 19, Adjutant-General's Office, 1892, I have the honor to submit the following report of the business of this office for the period commencing September 1, 1892, and ending August 31, 1893:

During the period named 386 sets of charges have been received, of which number 307 were tried by general court-martial, 8 recommended for trial in other departments, 5 returned for trial by garrison court-martial, 37 returned for trial by summary court, 6 restored to duty without trial, 5 discharged before trial, 1 died before trial, 7 withdrawn, 2 surrendered to civil authorities, 7 awaiting trial, and 1 pending.

The cases tried include—

Commissioned officers	2
Non-commissioned officers	24
Privates, etc	281
Total	307

The offenses tried include violations of the following articles of war:

Seventeenth	23	Thirty-ninth	13
Twentieth	3	Fortieth	8
Twenty-first	14	Forty-seventh	69
Twenty-fourth	1	Fifty-first	1
Thirty-first	1	Sixtieth	3
Thirty-second	47	Sixty-first	2
Thirty-third	24	Sixty-second	163
Thirty-eighth	29		

The cases tried are apportioned among the different organizations as follows:

First Infantry	1	Twenty-first Infantry	15
Second Infantry	67	Fourth Artillery	1
Third Infantry	1	Second Cavalry	2
Sixth Infantry	1	Sixth Cavalry	41
Seventh Infantry	33	Seventh Cavalry	2
Eighth Infantry	42	Eighth Cavalry	10
Thirteenth Infantry	1	Ninth Cavalry	20
Fifteenth Infantry	1	Hospital Corps	2
Sixteenth Infantry	36		
Seventeenth Infantry	31	Total	307

These records of trials have all been examined in this office, the decisions and orders of the department commander indorsed thereon, promulgated in orders, and forwarded to the office of the Judge Advocate-General.

INFERIOR COURTS.

During the period named 1,779 records of trials by inferior courts—garrison and summary—have been received, revised, and filed in this office, of which 1,736 were by summary and 43 by garrison court.

These trials include violations of the following articles of war:

Seventeenth	14	Thirty-third	598
Twentieth	2	Thirty-sixth	1
Twenty-first	3	Thirty-eighth	123
Twenty-fourth	2	Fortieth	3
Thirty-first	5	Sixtieth	1
Thirty-second	468	Sixty-second	784

These cases are apportioned among the different organizations, as follows:

Second Infantry	196	Sixth Cavalry	237
Seventh Infantry	280	Ninth Cavalry	274
Eighth Infantry	352	Hospital Corps	37
Sixteenth Infantry	146		
Seventeenth Infantry	173	Total	1,779
Twenty-first Infantry	84		

The number of different men tried by inferior courts during the year is 1,085, and the number of acquittals 50. The sentences in 2 cases were set aside as illegal, in 1 case the proceedings were set aside for want of jurisdiction, and in 4 cases sentences were disapproved by the post commander.

SUMMARY COURTS.

One thousand seven hundred and thirty-six records of trials by summary court have been received, revised and filed in this office. The following table exhibits the number of such cases tried by summary court at the several posts in the department:

Fort Douglas	144	Fort McKinney	202
Fort Logan	263	Fort Omaha	190
Fort Niobrara	204	Fort D. A. Russell	188
Fort Robinson	276	Fort Washakie	55
Fort Sidney	80	Camp Elkins, Wyo	33
Camp Pilot Butte	13	Bellevue Rifle Range	5
Camp Bettens, Wyo	58		
Fort Duchesne	25	Total	1,736

The above aggregate of cases are apportioned among the different organizations in the department as follows:

Second Infantry	193	Sixth Cavalry	236
Seventh Infantry	271	Ninth Cavalry	270
Eighth Infantry	340	Hospital Corps	34
Sixteenth Infantry	144		
Seventeenth Infantry	167	Total	1,736
Twenty-first Infantry	81		

The offenses tried by summary courts include violations of the following articles of war:

Seventeenth	13	Thirty-third	595
Twentieth	2	Thirty-sixth	1
Twenty-first	2	Thirty-eight	120
Twenty-fourth	2	Fortieth	3
Thirty-first	5	Sixtieth	1
Thirty-second	462	Sixty-second	748

In 16 cases brought before summary courts the accused objected to trial thereby and requested trial by court-martial.

The following table exhibits the number of trials by the different courts-martial in this department, as compared with the record of last year:

	General court-martial.	Garrison court-martial.	Summary court.	Per cent of trials to average enlisted strength.		
				General.	Garrison.	Summary.
1891–'92	290	39	2,504	7.8	1.06	68.
1892–'93	307	43	1,736	8.6	1.2	49.

It will be noticed that there is a slight increase in the percentage of trials by general and garrison courts over that of last year, but the number of such trials does not vary materially from the average reported from year to year. There is a heavy decrease in the number of trials by summary court, plainly due, I think, to the very general enforcement within this department of General Orders No. 73, Adjutant-General Office, 1892.

The marked success attained by troop and company commanders in maintaining discipline by resorting to such measures as admonition and deprivation of privileges rather than to trial by inferior courts, suggests very strongly the advisability of enlarging their power in this direction by extending to them by law the power to summarily punish men of their commands within restricted limits. Existing law and regulations make these commanders responsible for the discipline of their commands, and it would seem obvious that to be respected as sources of discipline they should have the power to adjudge punishment, at least for the more trivial offenses. That such a power would be subject to abuse at the hands of careless company commanders is undoubtedly true, but the same is true as to any other discretion vested in them; notwithstanding the exceptional instances which would doubtless arise, I can but think that the legislation suggested would be attended by highly beneficial results to the Army.

I renew my recommendation of last year, which was based upon reports of post commanders of this department, that changes be made in the code of maximum punishment as follows: "(1) In subdivisions *a* and *b*, paragraph 1 of said order (General Orders 21, Adjutant-General's Office, 1891) it is recommended that the period of confinement and forfeiture be doubled, and in subdivision *e*, same paragraph, recommended that the period of confinement be increased by six months. (2) In subdivisions *a*, *b*, and *c*, paragraph 2 of said order, recommended that the period of confinement be increased six months. (3) For offenses specified under the thirty-eighth article of war, recommended that forfeiture be doubled, except in the case of offense of drunkenness on guard."

An examination of the records of this office discloses the fact that 66 per cent of the offenses tried by general court, and about 80 per cent of the offenses tried by inferior courts have prescribed maximum punishments. I think this indicates a sufficient abridgment of the discretion of courts-martial in awarding sentence to guard the service against the inequality of punishment so common under the old practice. It is possible that maximum punishment should be provided for one or two additional offenses, but in a general way the code has met the necessities of the service in an admirable manner and deserves to stand, with few modifications, for the future guidance of courts.

Very respectfully, your obedient servant,

E. H. CROWDER,
Captain and Acting Judge-Advocate, U. S. Army.

The JUDGE-ADVOCATE-GENERAL, U. S. ARMY,
Washington, D. C.

REPORT OF CAPT. F. J. KERNAN, ACTING JUDGE-ADVOCATE, DEPARTMENT OF TEXAS.

HEADQUARTERS DEPARTMENT OF TEXAS,
JUDGE-ADVOCATE'S OFFICE,
San Antonio, September 8, 1893.

SIR: I have the honor to submit the following report of the business of this office for the year ending August 31, 1893.

There were no commissioned officers tried.

The following table shows the number of general, garrison, and summary court-martial cases tried at the several posts in the department, with the percentage of trials:

Posts.	Number and percentage of trials.						
	Average enlisted strength of garrison.	General cases tried.	Percentage of general cases.	Garrison cases tried.	Summary cases tried.	Total inferior cases tried.	Percentage of inferior cases.
Fort Bliss	108	25	23.15	5	45	50	46.30
Fort Brown	72				70	70	97.22
Fort Clark	370	43	11.62		155	155	41.89
Fort Hancock	52				18	18	34.61
Fort McIntosh	209	30	14.35	1	158	159	76.08
Fort Ringgold	195	12	6.15	3	77	80	41.03
Fort Sam Houston	588	51	8.67	2	307	309	52.55
Camp Eagle Pass	55				66	66	120.00
Camp J. D. Mann	55				15	15	27.27
Camp Pena Colorado	32				6	6	18.75
Camp Salineno	52				6	6	11.54
Headquarters Department of Texas	18						
Total	1,806	161	8.91	11	923	934	51.72
Convictions		158		11	900	911	
Acquittals		3			23	23	

There were 599 different enlisted men tried by inferior courts-martial.

The different offenses tried by general courts-martial were as follows:

Nature of offense.	Article of war violated.	Cases tried.
Selling, or through neglect, losing arms, etc	Seventeenth	12
Disrespect to commanding officer	Twentieth	1
Disobeying lawful command of superior officer	Twenty-first	7
Resisting arrest	Twenty-fourth	2
Absence without leave	Thirty-second	27
Failing to report to place for roll call, etc	Thirty-third	16
Drunkenness on duty	Thirty-eighth	19
Sleeping on post	Thirty-ninth	2
Quitting guard or party	Fortieth	5
Desertion	Forty-seventh	49
Advising to desert	Fifty-first	1
Theft, in violation of the sixtieth article of war	Sixtieth	2
Theft, in violation of the sixty-second article of war	Sixty-second	13
Conduct to the prejudice of good order and military discipline	Sixty-second	89

The total cases tried are distributed among organizations as follows:

Regiment or corps.	General.	Inferior trials.	
		Garrison.	Summary.
Hospital Corps	3		10
First Cavalry	6		
Third Cavalry	51	1	248
Fifth Cavalry	8		97
Seventh Cavalry	11		44
Eighth Cavalry	1		
Third Artillery	4	1	39
Fifth Infantry	3		46
Seventh Infantry	1		
Tenth Infantry	3		
Twelfth Infantry	1		
Thirteenth Infantry	1		
Eighteenth Infantry	34	3	214
Twenty-third Infantry	31	6	221
General Service Recruits	1		
Indian Scouts	2		4
Total	161	11	923

The following table affords comparisons as to average enlisted strength of the Department, and number and percentage of trials for the periods stated:

Year.	Average enlisted strength.	Trials by courts-martial.		Percentage of trials.	
		General.	Inferior.	General.	Inferior.
1892 (11 months)	1,570	134	958	8.54	61.02
1893	1,806	161	934	8.91	51.72

The foregoing statistics exhibit, when compared with last year's report, a gratifying decrease in the number and percentage of trials by inferior courts-martial. In my opinion, this is due to a juster conception throughout the service of the proper use of the new summary court. At first there was a tendency, natural but pernicious, to lay almost the entire burden of maintaining discipline upon the summary court officer. A reaction from this has followed and the better practice now prevails of trying only the more pronounced infractions of discipline.

The increased percentage of trials by general courts-martial is caused by the increased number of deserters apprehended and tried. Civil officers, under the stimulus of $60 reward, are more on the lookout for this class of offenders. It will be seen from the appended tables that 49 deserters were tried in this department this year against 33 last year.

The number of trials by garrison court-martial has fallen from 46 last year to 11 this year. This decrease marks the almost complete disuse into which the garrison court is destined to fall. And from it one may also draw the inference that the summary court has proved satisfactory to the enlisted man, as it undoubtedly has to the officer.

I wish to renew my recommendation of last year respecting the revival and enlargement of the powers of the garrison court-martial and to add my voice to the others before me who have urged the emancipation of this department from its state of dependence upon the Adjutant-General's Department for clerical work.

Appended hereto is my report to the department commander upon the subject of desertions in this department during the last fiscal year. There has been a slight increase in the percentage of these offenders. In my judgment it is very easy to deplore too much the number of desertions taking place each year. If it is borne in mind that the service is generally thus rid of a worthless character, consolation as well as regret, may spring from the fact of desertion.

From various causes, trials have not always followed the offense as speedily as is desirable, but otherwise the administration of justice in this department has been successful.

Very respectfully,

F. J. KERNAN,
Captain and Acting Judge-Advocate.

The JUDGE-ADVOCATE-GENERAL, U. S. ARMY,
Washington, D. C.

REPORT OF CAPT. A. C. SHARPE, ACTING JUDGE-ADVOCATE, DEPARTMENT OF THE COLORADO.

HEADQUARTERS DEPARTMENT OF THE COLORADO,
OFFICE OF THE JUDGE-ADVOCATE,
Denver, Colo., August 31, 1893.

SIR: In compliance with paragraph 984, Army Regulations, I have the honor to submit the following report of the business of this office for the year ending this date:

COURTS-MARTIAL.

Enlisted men.

There were 168 enlisted men tried by general courts-martial during this period from the different organizations serving in this department.

Hospital Corps	4	Eleventh Infantry	9
First Cavalry	52	Sixteenth Infantry	3
Second Cavalry	33	Twenty-fourth Infantry	38
Ninth Cavalry	—		
Seventh Infantry	3	Total	168
Tenth Infantry	26		

The number of enlisted men tried by general courts-martial at the different posts in the department, is shown by the following schedule:

Fort Apache	4	Fort Marcy	10
Fort Bayard	32	San Carlos	1
Fort Bowie	5	Fort Stanton	13
Fort Douglas	3	Whipple Barracks	7
Fort Du Chesne	—	Fort Wingate	19
Fort Grant	46		
Fort Huachuca	25	Total	168
Fort Logan	3		

The following schedule exhibits the nature of the offences for which enlisted men were tried by general courts-martial:

Violation of the—		Violation of the—	
Seventeenth Article of War	6	Thirty-eighth Article of War	19
Twentieth Article of War	2	Thirty-ninth Article of War	6
Twenty-first Article of War	14	Fortieth Article of War	6
Thirty-first Article of War	1	Forty-seventh Article of War	29
Thirty-second Article of War	23	Sixtieth Article of War	3
Thirty-third Article of War	10	Sixty-second Article of War	105

Some being tried with violation of two or more articles of war on the same trial.

Offences.

Absence without leave	23	Destroying Government property	1
Absent from roll calls	10	False statements	9
Absent from duty	8	Fighting	2
Assault	11	Forgery	1
Assault with weapon	11	Fraudulent enlistment	5
Abusing animals	1	False swearing	1
Allowing prisoner to escape	1	Inattention at drill	1
Attempting to escape from guard	2	Indecent exposure	1
Attempt to commit felony	1	Leaving post while sentinel	3
Breaking arrest	3	Lying out of quarters	1
Committing nuisance	1	Manslaughter	2
Creating disturbance	5	Misappropriating public property	3
Carrying deadly weapon	2	Neglect of duty	9
Desertion	29	Perjury	3
Disobedience of orders (twenty-first article of war)	14	Quitting guard	6
Disobedience of post or company orders (Sixty-second article of war)	5	Refusing to obey non-commissioned officer	20
Drunk	13	Resisting arrest	6
Drunk and disorderly	9	Sleeping on post	3
Drunk on duty	19	Selling arms, clothing, etc	6
Disrespect to sentinel	3	Selling or appropriating another's property	8
Disrespectful and insubordinate (twentieth article of war)	2	Theft	11
Disrespectful and insubordinate (sixty-second article of war)	13	Threatening to kill	4
Disorderly conduct	8	Using abusive, obscene, or threatening language	22
		Writing direct to Secretary of War	1

Of the whole number of trials by general courts-martial, 6 resulted in acquittal. Twenty-four men were dishonorably discharged through citation of previous convictions under paragraph 3, General Orders No. 21, series 1891, Adjutant-General's Office.

INFERIOR COURTS.

Trials by inferior courts-martial number 1,911 during the year, and are divided among the several posts of the department, as follows:

Posts.	Number of trials by—		Total.
	Summary courts.	Garrison courts.	
Fort Apache	116	3	119
Fort Bayard	342	18	360
Fort Bowie	29	—	29
Fort Douglas	177	2	179
Fort Du Chesne	27	1	28
Fort Grant	148	7	155
Fort Huachuca	185	4	189
Fort Logan	292	6	298
Fort Marcy	91	2	93
Fort Stanton	57	1	58
San Carlos	21	—	21
Whipple Barracks	131	—	131
Fort Wingate	250	1	251
Total	1,866	45	1,911

In 36 cases, objection was made to trial by summary court.

The following schedule exhibits the nature of the offences for which enlisted men were tried by inferior courts:

Violation of the—		Violation of the—	
Twenty-first Article of War	4	Thirty-sixth Article of War	2
Thirty-first Article of War	18	Thirty-eigth Article of War	94
Thirty-second Article of War	459	Fortieth Article of War	1
Thirty-third Article of War	514	Sixty-second Article of War	842

Number of acquittals by summary courts	61
Number of acquittals by garrison courts	7
Total	68
Number of different men tried	1,106
Average enlisted strength	2,754
Per cent of enlisted men tried by inferior courts	40+

DESERTIONS.

There have been ninety-four desertions from the different organizations serving in this department during the past year, as follows:

Hospital Corps	1	First Cavalry	36
Seventh Infantry	6	Second Cavalry	14
Tenth Infantry	21	Ninth Cavalry	—
Eleventh Infantry	8		
Sixteenth Infantry	1	Total	94
Twenty-fourth Infantry	—		

Average enlisted strength	2,754
Per cent of desertions	$3\frac{4}{100}$

Companies of Seventh and Sixteenth Infantry and two troops of the Ninth Cavalry, have only been connected with these headquarters during July and August; and the number of trials by general courts-martial and the desertions referred to, pertaining to these organizations, are those only which have occurred in the two months specified. The report of *summary court* include those had in these organizations for the *entire* year.

REMARKS.

There were no officers tried in this department during the year, and the percentage of trials, convictions, and acquittals of enlisted men, both by general and inferior courts, remains substantially unchanged from last year.

THE SUMMARY COURT.

Attention is invited to the views of troop and company commanders, hereto appended, with reference to the value and efficiency of the summary court. It is believed that the interests of justice and discipline would be still further promoted if the law were so amended as to authorize the selection of the summary court officer by the post or department commander.

Should efforts to secure further legislation be renewed in the present Congress, I desire to add my earnest indorsement to the recommendations of my predecessor and others looking to an enlargement of the powers of the garrison court, the repeal of the ninety-fourth article of war, the proposed amendment of the eighty-sixth article authorizing military courts to protect parties before them against the contempt of contumacious witnesses, and such amendment of article seventy-five as will invest department commanders with wider discretion in constituting general courts. The reasons for these changes are well known and have been so frequently presented as to call for no further repetition here.

Justice also demands that soldiers should be required to make good time lost by confinement in the guard house pursuant to sentence, or where otherwise withdrawn through their own misconduct from their legitimate duties. It is believed that the odium of dishonorable discharge should be still further emphasized in all cases by a period of confinement appropriate to the offence, as shown by circumstances of aggravation, or in cases of habitual offenders.

The code of punishments prescribed by General Orders No. 21, Adjutant General's Office, series 1891, seems, in general, sufficient and satisfactory. The interests of discipline and the dignity of military administration, however, appear to demand that no offence of sufficient gravity to require the notice of a court should be considered so trifling as to be satisfied with a fine of 25 or 50 cents. The minimum forfeiture for a first offence should be no less than $1. If the matter is not of that much importance to the Government it would better be left to the discretion of the troop or company commander.

The tendency of the present practice seems to be to deprive subordinate commanders of that wholesome disciplinary authority over their men, so absolutely essential to good order in a garrison. This is a matter which must rest largely with the post commanders.

In one company (Capt. Myers, Eleventh Infantry) it is gratifying to note no trials during the year.

It is believed that the suggestions contained in my predecessor's report of last year with reference to the transcripts of summary court records, would, if adopted, relieve the clerical force of much unnecessary labor; some of these papers are very voluminous and cumbered with much useless detail.

DESERTION.

The increase in desertion is quite marked, being 3.05 per cent for the present year as against 1.99 per cent last year, the last annual report, however, covering a period of but eleven months. Of the 94 desertions this year, 36 were from the First Cavalry, at Fort Grant. Investigations of boards convened under paragraph 117, Army Regulations, and the evidence adduced before courts, fail to discover any reasonable inducement to this grave crime. It is evident, however, that the conditions of the service, especially the requirements relating to fatigue duty, are not made sufficiently clear to recruits, and many are overtaken with disappointment and easily persuade themselves that they have been deceived. If the daily toil on sewers, roads, waterworks and other improvements, which is required at some posts through protracted periods, could give place to more professional instruction, individual training, gymnastic, athletic and field exercises, a fruitful source of complaint would disappear.

The methods now employed for the apprehension, trial, and punishment of deserters seem in general quite adequate. If this crime is to be reduced to a minimum and kept there, methods of prevention must be devised to supplement the deterrent influences now in operation through the instrumentality of the court-martial Serious infractions of discipline have steadily decreased during the past fifteen years with a corresponding decrease in severity of punishment. Improvements in the recruiting, feeding, clothing, and quartering of soldiers, together with the removal of the post trader and the intsitution of the exchange, have justified all reasonable expectations. To still further elevate the *personnel* of the enlisted force, provision should be made by law for placing every honorably discharged soldier first in line for appointment in the civil service. A good discharge paper would then be given a new and much prized value. It would be a guarantee to the Government of fidelity and honesty, and the added inducement thus offered by the

recruiting service would draw into the ranks plenty of young men of steady habits and good purpose.

The reports and records of trials recorded at this office show that a large proportion of the offences committed by soldiers are directly or indirectly traceable to excessive indulgence in intoxicants. This fact suggests a more watchful control of the post exchange, and a wider discretion in the hands of troop and company commanders as to the methods to be employed to protect the weak and punish the vicious and incorrigible.

CLERK.

I desire to add my indorsement to the recommendations of my predecessor in the last annual report from this office on the importance of having the clerk now assigned to duty in the judge-advocate's office wholly under the direction and control of the Judge-Advocate-General's Department. The duties devolved upon these men call for special qualifications and they should not be subject to other duty or liable to transfer to other work.

BOOKS.

The excellent collection of elementary works and reports in the office library augmented by valuable additions during the past year, together with the allotment of funds for securing such texts and publications as may be desired, have proved of daily convenience and greatly facilitated the work of the office.

Very respectfully,

A. C. SHARPE,
Captain, U. S. Army, Acting Judge-Advocate.

The JUDGE-ADVOCATE-GENERAL, U. S. ARMY,
Washington, D. C.

APPENDIX.

REMARKS OF OFFICERS.

Surgeon L. M. Maus: The working of the summary court is commendable.

Capt. F. M. Crandal, Twenty-fourth Infantry: I consider the summary court a great aid to discipline.

Capt. C. Williams, Seventh Infantry: The summary court works well in practice.

Capt. C. A. Coolidge, Seventh Infantry: The effects of trials by inferior courts are of great benefit to the service, causing much improvement in the behavior of the men.

Capt. J. M. Thompson, Twenty-fourth Infantry: I cannot speak too highly of the summary courts, and especially of the five previous trials and convictions plan. It works to a charm in the company; the men start out on their enlistment in the old free and easy style, but after three or four trials for minor offences, begin to think the matter over, and when there is any worth at all in the man he settles down to business, and thereafter is classed among the best soldiers of the company.

Capt. A. C. Markley, Twenty-fourth Infantry: The system works well and the feature allowing discharge by general court-martial, after repeated convictions, is most excellent.

Capt. J. T. Kirkman, Tenth Infantry: I have the honor to recommend that a list of officers preferring charges under above articles of war be published annually and furnished company commanders.

Capt. E. D. Dimmick, Ninth Cavalry (Fort Du Chesne): Trial by summary court has proved satisfactory at this post. I approve it.

Capt. John Drum, Tenth Infantry: I believe a summary court was intended to be like a recorder's or police court; the first sergeant to be the policeman, take the offender up, state his offence, or have it stated on a slip of paper, with witnesses present, docket kept by summary court officer, thus saving clerical work. Now it makes more clerical work in company than old system.

Capt. Colon Augur, Second Cavalry: The working of the summary court is satisfactory.

Capt. A. L. Myer, Eleventh Infantry: There has been no court-martial of any kind in the company from August 31, 1892, to September 1, 1893, the time specified in letter dated August 5, 1893, headquarters Department of the Colorado.

Capt. Henry Wygant, Twenty-fourth Infantry: I am of the opinion that the post exchange is responsible for the large number of trials by summary court.

Capt. C. S. Burbank, Tenth Infantry: Prompt trial by summary court-martial has a very good effect upon the discipline of the company.

Capt. F. U. Robinson, Second Cavalry: The summary court system seems to work well, but in my opinion the penalties are not severe enough to give the majority of men proper respect for the court.

Capt. J. A. Buchanan, Eleventh Infantry: I have been in command of this company one month. The number of men tried (12) I believe to be small.

Capt. F. W. Mansfield, Eleventh Infantry: My experience during the past year as summary court officer leads me to believe that a large number of summary court cases are caused by trivial offences, many of which are brought about by requiring soldiers to do work for which they were not enlisted, and for which they are not paid. The power of a garrison court-martial should be increased, so that it can inflict a punishment covering a period of two, if not three, months instead of only one month, as at present. This would reduce materially the number of cases for a general court-martial, and also, I think, those for a garrison court, to say nothing of saving of time and sometimes expense.

Capt. R. W. Hoyt, Eleventh Infantry: It will be observed that about one half of the trials by inferior courts are for absence from some duty, roll calls, fatigue and the like, and that under the present system a man may place himself liable at all times (24 hours each day) to charges of this nature. This seems too much to ask of any class of men in times of peace, in garrison service and for thirteen dollars per month. Except for special services, marches, etc., the eight-hour law should be enforced, and the time and labor required of troops on all duty, including roll calls, should be regulated by that law. Labor or duty under different names, whether necessary, useful, or otherwise, is held too cheap by the inconsiderate, but is very expensive to the service. Men who do not enlist to work under such restraint become dissatisfied and leave. It is suggested that stoppages of pay for these offences be prohibited by law and when punishments are necessary that it be in the nature of "hard labor."

Capt. A. H. Jackson, Seventh Infantry: These trials result from comparatively trivial offences and are believed to have accomplished an improved state of discipline and efficiency.

Surgeon J. D. Poindexter: Attention is called to the fact that when a man of the hospital corps is given a term of confinement the punishment falls almost as much upon his comrades as upon himself, inasmuch as they must then do his duty —a matter of importance at a small hospital.

Capt. F. W. Kingsbury, Second Cavalry: I consider the summary court the best system for administration of justice in minor cases that I have known during 23 years' service.

Capt. C. J. Crane, Twenty-fourth Infantry: Soldiers ordered for trial by summary court frequently prefer trial by garrison court for the reason that the latter court requires *copies* of proceedings or orders showing previous convictions, whereas summary courts do not. In this way men frequently escape cumulative punishment for the fourth and other offences. It is believed that in many cases—for instance, all trials for absence under thirty-second and thirty-third articles of war—if punishments were more severe there would be fewer of such offences, and that the frequency of such offences is caused by the light punishment awarded to the first and second of them.

Capt. W. Paulding, Tenth Infantry: It is suggested that in *every* case where a man has had over five trials, that he be brought to trial before a general court and that, if necessary, orders be issued to that effect, as these soldiers are only a dead weight to a company, being constantly in the guard house.

Capt. F. W. Sibley, Second Cavalry: The effect of the summary court on the discipline of the troop has been beneficial, and has materially lessened the work of officers who formerly were required to sit on garrison courts-martial, and in the main I deem the present method an improvement over the old system, but believe it to be defective in that the court is restricted in certain instances in providing adequate sentences for minor offences.

First Lieut. A. B. Johnson, adjutant Seventh Infantry: I consider the summary court one of the best methods for quick and summary punishment. I do not believe in giving extra work around the barracks as punishment for small offences. All breaches of discipline which merit punishment should go before a court.

First Lieut. C. R. Tyler, adjutant Sixteenth Infantry: I consider that the system of trial by summary court affords a long-felt want in the Army, viz, a method of quick punishment for minor offences without keeping the offender in confinement, and it also saves a large amount of clerical labor and places the power of administering justice in the hands of an officer of experience.

First Lieut. R. R. Steedman, Sixteenth Infantry: The men tried as per above statement had, previous to charges being preferred against them, committed like offences and had been kindly admonished. In no case has a man of this company been brought to trial without having been previously warned.

First Lieut. W. C. Brown, First Cavalry: Many of the punishments seem to be too light. To award a man 50 cents for an offence has the effect to bring a summary court into contempt rather than to inspire a wholesome respect for it. For such minor offences as absence from retreat or reveille roll call a reprimand from the company commander, coupled with a little extra duty such as kitchen police, answers the purpose of discipline much better than a 50 cent fine. When, however, such arbitrary punishments are given, they should *always* be less than what a summary court would give for the same offence, and the man always be given the option of going before a summary court if he prefers it.

First Lieut. L. M. Brett, adjutant Second Cavalry: The summary court system has proved satisfactory. It seems to afford a prompt and efficient method of administering justice and is in my opinion a great improvement upon the old garrison court system.

First Lieut. T. J. Lewis, Second Cavalry: In the case of the Navajo soldier the most effective punishment is forfeiture of pay. Confinement seems to trouble him but little. The bi-monthly payment, even with a forfeiture of $5 deducted, leaves him a sum of money beyond his needs, to be used according to his inclinations. G. O. 21, A. G. O., series 1891, does not seem to fully meet the object of punishment in his case—no deterring effect, the greater part of his pay should be retained—$ per month in cash will meet all his current needs; a forfeiture in this case is a hardship which will be avoided. More money carries temptation with it.

First Lieut. A. M. Fuller, Second Cavalry: Have had cases sent to inferior court which were, properly, general court cases, as, for instance: Positive disobedience of orders of room superintendent in the execution of his office; summary court gave $2. Punishments for absence without leave altogether too lenient to enforce discipline.

First Lieut. A. L. Mills, adjutant First Cavalry: The effect of the summary court upon discipline, I believe to be excellent. I think the maximum punishment it can award under the thirty-second, thirty-third, and thirty-eighth articles of war should be increased considerably.

First Lieut. Z. B. Vance, jr., Eleventh Infantry: Nine-tenths of these cases can be traced to the influence of the native Indians around this post, especially the squaws, who furnish large quantities of "tizwin" (Indian beer) and other seductive commodities with a free hand. I venture to say that if this company (Indian) had been stationed somewhere away from an Indian reservation, these trials would have been reduced fully one-half. These Indians when not subjected to such influences are remarkably amenable to discipline.

First Lieut. W. H. Bean, Second Cavalry: During the year there have been forty-one men in this troop who were not tried by any court. I have disposed of some minor delinquencies not meriting trial, with admonitions or the withholding of privileges. I believe the summary court a great improvement upon the garrison court.

First Lieut. J. D. L. Hartman, First Cavalry: The working of the summary court seems to meet all requirements. Nearly all of the cases tried in this troop had their origin in some of the numerous "ranches" or "dives" in the immediate vicinity of the post. These dives are most demoralizing to the soldiers.

Respectfully submitted.

A. C. SHARPE,
Captain, U. S. Army, Acting Judge-Advocate.

REPORT OF OFFICER IN CHARGE, JUDGE-ADVOCATE'S OFFICE, DEPARTMENT OF THE EAST.

HEADQUARTERS DEPARTMENT OF THE EAST,
JUDGE ADVOCATE'S OFFICE,
Governor's Island, New York, September 16, 1893.

SIR: In obedience to the provisions of paragraph 984, as amended by General Orders No. 19, Headquarters of the Army, March 16, 1892, I have the honor to submit the following report of the business of this office for the period commencing September 1, 1892, and ending August 31, 1893.

Number of cases tried by general court-martial.

Commissioned officers	None.
Non-commissioned officers	27
Privates	449
Total	476

The offenses alleged under the Articles of War were as follows:

Violation of the—		Violation of the—	
Seventeenth	3	Twenty-first, thirty-third, and sixty-second	1
Seventeenth and sixty-second	2	Twenty-fourth and sixty-second	1
Seventeenth, twenty-first, and sixty-second	1	Thirty-second	27
Seventeenth and thirty-second	9	Thirty-second and thirty-third	13
Seventeenth, thirty-second, and sixty-second	4	Thirty-second and forty-seventh	1
Seventeenth and thirty-third	1	Thirty-second and sixty-second	22
Seventeenth and forty-seventh	3	Thirty-second, thirty-third and sixty-second	11
Seventeenth, forty-seventh, and sixty-second	2	Thirty-third	4
Twentieth	1	Thirty-third and sixty-second	9
Twentieth, twenty-first, and sixty-second	1	Thirty-eighth	20
Twentieth and forty-seventh	1	Thirty-eighth and thirty-ninth	1
Twentieth and sixty-second	1	Thirty-eighth and sixty-second	7
Twenty-first	7	Thirty-ninth	14
Twenty-first and thirty-second	1	Fortieth	2
Twenty-first, thirty-second, and thirty-third	1	Fortieth and sixty-second	2
Twenty-first, thirty-second, and sixty-second	2	Forty-seventh	120
Twenty-first and thirty-third	1	Forty-seventh and sixty-second	5
Twenty-first and sixty-second	7	Fifty-fifth	2
		Sixtieth	1
		Sixty-second	165
		Total	476

Of the number brought to trial by general courts-martial twenty-nine (29) were acquitted.

Number of cases tried by garrison courts-martial, 28.

The offenses alleged under the Articles of War were as follows:

Violation of the—	
Seventeenth	1
Thirty-second and thirty-third	3
Thirty-second and sixty-second	1
Thirty-third	1
Sixty-second	22
Total	28
Number of different men tried	28
Number acquitted	5

Number of cases tried by summary courts, 3,187.

The offenses alleged under the Articles of War were as follows:

Violation of the—		Violation of the	
Seventeenth	11	Thirty-second, thirty-third, and sixty-second	14
Seventeenth and thirty-second	5	Thirty-third	626
Seventeenth and sixty-second	1	Thirty-third and thirty-eighth	3
Twentieth	1	Thirty-third and sixty-second	86
Thirty-first	3	Thirty-eighth	102
Thirty-first, thirty-second, and sixty-second	1	Thirty-eighth and sixty-second	15
Thirty-second	882	Sixty-second	1,213
Thirty-second and thirty-third	112	Total	3,187
Thirty-second and thirty-eighth	15	Number acquitted	53
Thirty-second and sixty-second	97		

Number of different men tried as follows:

Tried once	1,041
Tried twice	396
Tried three times	197
Tried four times	94
Tried five times	40
Tried six times	17
Tried seven times	6
Tried eight times	3
Tried nine times	1
Tried ten times	1
Total	1,796

The number of summary court cases tried at different posts in the department and the average strength of each garrison will be found shown by the following table:

Name of post.	Average strength.	Number of cases tried.
Fort Porter, N. Y	115	66
Fort Niagara, N. Y	191	68
Fort Ontario, N. Y	61	24
Madison Barracks, New York	346	222
Plattsburg Barracks, New York	58	38
Fort Preble, Me	59	22
Fort Warren, Mass	112	199
Fort Adams, R. I	253	130
Fort Trumbull, Conn	62	25
Fort Hamilton, New York Harbor	259	169
Fort Wadsworth, New York Harbor	173	112
Fort Columbus, New York Harbor	173	100
Fort Wood, New York Harbor	57	29
Fort Schuyler, New York Harbor	107	88
Fort McHenry, Md	162	81
Washington Barracks, District of Columbia	300	287
Fort Myer, Va	268	303
Fort Monroe, Va	390	173
St. Francis Barracks, Florida	126	81
Key West Barracks, Florida	62	11
Fort Barrancas, Fla	128	136
Mount Vernon Barracks, Florida	163	169
Fort McPherson, Ga	415	290
Jackson Barracks, Louisiana	118	99
Newport Barracks, Kentucky	59	30
Fort Thomas, Ky	373	235
Total		3,187

A comparison with the business of eleven months of the preceding year is submitted as follows:

Number of trials by general courts-martial for October 1, 1892, to August 31, 1893	435
Number of trials by general courts-martial from October 1, 1891, to August 31, 1892	462
Decrease	26
Number of trials by garrison courts-martial and by summary courts from October 1, 1892, to August 31, 1893	2,946
Number of trials by garrison courts-martial and summary courts from October 1, 1891, to August 31, 1892	3,669
Decrease	723

Very respectfully, your obedient servant,

C. G. TREAT,
First Lieutenant Fifth Artillery, Aide-de-Camp,
In charge of office.

The ACTING JUDGE-ADVOCATE-GENERAL, U. S. ARMY,
Washington, D. C.

REPORT OF THE QUARTERMASTER-GENERAL.

REPORT

OF

THE QUARTERMASTER-GENERAL.

QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., September 14, 1893.

SIR: I have the honor to submit the annual report of the Quartermaster's Department for the fiscal year ending June 30, 1893:

By acts of Congress of July 16 and August 5, 1892, there was appropriated for the service of the Quartermaster's Department for the fiscal year 1892–'93 the sum of		$8,186,880.00
During the fiscal year there was deposited to the credit of said appropriations, amounts received from sales to officers, etc., the sum of		497,014.43
Making a total of		8,683,894.43
Of this amount there was remitted to disbursing officers, $7,451,132.28		
There was paid out on account of settlements made at Treasury of claims and accounts	11,600.38	
		7,462,732.66
Leaving a balance available for payment of outstanding obligations incurred, or fulfillment of contracts properly entered into within the fiscal year		1,221,161.77
On the 1st of July, 1892, there was on hand from regular appropriations for the service of the Quartermaster's Department, pertaining to the fiscal year ending June 30, 1892, the sum of		1,044,481.26
And from appropriations pertaining to previous fiscal years, including those for specific and indefinite purposes, the sum of		1,893,169.20
Making a total balance on hand from all appropriations July 1, 1892, of		2,937,650.46
For specific purposes there was appropriated during the fiscal year ending June 30, 1893		653,345.93
During the year there was deposited and transferred to credit of the appropriation other than those for 1892–'93 (shown above) the sum of		649,522.54
Making a total of		4,240,518.93
Of said amount there was remitted to disbursing officers the sum of	$1,393,686.87	
There was paid out on account of Treasury settlements and transferred the sum of	620,749.36	
There was carried to the surplus fund the sum of	555,950.21	
		2,570,386.44
Leaving a balance of		1,670,132.49

The reports of the several officers on duty in this office, which are transmitted herewith, show in detail the transactions of the Quartermaster's Department for the past fiscal year.

Attention is invited to the following:

CLOTHING AND EQUIPAGE SUPPLIES.

The sum appropriated for the past fiscal year for the purchase and manufacture of clothing and equipage was $1,200,000. There was placed to the credit of this appropriation the sum of $215,150.19 account of issues of clothing and equipage to the militia and $110,61[illegible] from sales to officers, etc., making a total of $1,525,761.82.

Of this sum $1,301,285.23 was paid out during the fiscal year, leaving a balance on hand June 30, 1893, of $224,476.59, which will be required to meet outstanding obligations.

The issues to the militia of the several States and Territories during the fiscal year amounted to $219,893.24.

The following issues were made during the fiscal year, which, with the sales credited to miscellaneous receipts, represent a total loss to the clothing appropriation:

For prisoners' clothing, &c., military prison, Fort Leavenworth, Kans ..	$1,586.11
For prisoners' clothing, Alcatraz Island, Cal	1,227.19
To the militia of the District of Columbia	6,565.60
To the Indian prisoners of war, Mount Vernon barracks, Ala	4,877.27
Sale of leather cuttings at military prison, Fort Leavenworth, Kans., proceeds credited to miscellaneous receipts	258.32
Sale of condemned clothing and equipage, &c., proceeds credited to miscellaneous receipts	9,442.47
Total	23,956.96

By authority of the Secretary of War there was transferred to the Supervising Surgeon-General of the Marine-Hospital Service, for the cholera quarantine station at Sandy Hook, New Jersey, 400 tents, from those purchased for use of the sufferers from the overflow of the Mississippi River, under act of Congress approved March 31, 1890.

Orders were also given to transfer 200 tents to the Marine-Hospital Service for the establishment of an emigrant detention camp on Fisherman's Island. Total cost of all these tents was $4,920.

BOOTS AND SHOES.

Preliminary steps have been taken to change the present style of Army boot for the enlisted men, as soon as the present stock shall have been sufficiently reduced by issues. It is the intention to substitute calf-skin for the wax upper leather heretofore used for that purpose, and at the same time make the legs of the boots lighter, thereby materially reducing the weight.

As indicated in my last annual report, it has been decided to manufacture, upon improved lasts, a new kind of Army shoe, the uppers of which will be composed of heavy calf-skin leather, weighing from 55 to 60 pounds to the dozen skins. To guard against the breaking of the uppers from the soles, the new shoes will have side linings of calf skin, and in addition thereto the vamps are lined throughout with 8 ounces canvas duck. It is hoped that these shoes may prove satisfactory and answer all the requirements of post and field, for every intelligent effort has been given to the production of a good and comfortable service shoe, the necessity of which is fully appreciated.

Orders have been placed for the manufacture and purchase, by contract, of a supply of the shoes described, and the Department will soon be ready to commence their issue to the Army.

LEGGINGS FOR MOUNTED TROOPS.

Canvas leggings of extra length were purchased and issued during the year for use of cavalry troops stationed in Arizona, and other similar latitudes.

From the favorable reports and comments of officers after trial, it appears that these leggings, when worn with the regulation shoe, constitute a more comfortable and satisfactory equipment for that climate than the boots now supplied, and a stock of such leggings will hereafter be kept in depots for issue to the cavalry.

RUBBER CAPES.

The stock of rubber blankets and ponchos left over at the close of the war having become exhausted, the subject of procuring another supply of waterproof equipments has been given consideration. Samples of various kinds and qualities of articles adapted to the purpose were procured by special manufacture, and their merits considered and compared. A careful study of the whole subject has led to the conclusion that a rubber cape or talma will serve both the purpose of the blanket and poncho and afford as much protection as a rubber coat, without the latter's disadvantages of weight, warmth, etc. Arrangements have been made to procure 300 of these capes for distribution to the Army for trial. They will be of two lengths (38 and 40 inches), will button down in front in a concealed flap, and have high collars, which, when raised, will fit closely to the neck, affording ample protection from storm. They will admit of free air circulation and are capable of easy adjustment.

IRREGULARITIES OF CUT AND MAKE IN CLOTHING.

Just criticism has been passed, both in and out of the Army, upon the wide differences existing in the size and cut of clothing worn by enlisted men. All "made-up" clothing issued is of standard uniform pattern, but the practice of issuing uniform supplies "unmade" results either in the uniforms being made up according to the erratic and changeable caprice of some easily accessible tailor, or more frequently, it would appear, in allowing the varying fancy or uneducated taste of the soldier to assert itself. The result is a lack of uniformity, unpleasing alike to the military and to the civilian. Thus one may see in nearly every company in the Army, as well as on our streets in cities and towns, both close-fitting and loose blouses and coats; while individual tastes in trousers run the gamut from the skin-tight variety, with swelling "hoodlum" or "bowery" bottoms, to those of exaggerated, sailor-like proportions.

The effect upon the beholder of this grotesque exhibition is not pleasant, and, if no other remedy can be found for this departure from regular standards, it is respectfully suggested that the issue of unmade clothing be suspended altogether.

The Quartermaster's Department furnishes twelve different sizes in trousers of uniform cut, and there need be no difficulty in fitting every enlisted man.

TRANSPORTATION.

During the past fiscal year the Quartermaster's Department furnished transportation for 367,577 persons, 6,948 animals, and 99,692 tons of material.

The expenditures from the transportation appropriation during the fiscal year, so far as shown by accounts received, amounted to $2,286,915.76.

The sum of $164,391.13, exclusive of deductions on account of land-grant and bond-aided railroads, was expended during the year for the principal movements of troops in changing stations.

The sum of $14,010.76 was expended for the transportation of troops in connection with summer encampments, practice marches, etc., and the sum of $34,831.25, for the transportation of enlisted men to engage in rifle competition and target practice.

During the year there were transported over the bond-aided Pacific railroads, their branches and leased lines, 7,442 persons, 1,664 animals and 18,706 tons of freight.

Eight steamboats owned by the Quartermaster's Department have been kept in service during the past fiscal year, at a cost, including repairs, of $96,330.29, and the sum of $9,246.54 was expended for the hire of vessels temporarily required.

The Western Union Telegraph Company has continued to transmit all messages on official military business committed to it during the past fiscal year. Its accounts for this service have not as yet been presented for payment.

Such payments as have been made to this company during the past year for telegraph service rendered in the two preceding fiscal years have been at rates fixed by the Postmaster-General, and have been accepted by the telegraph company under form of protest recognized by the accounting officers of the Treasury, which was published in the last annual report of the Quartermaster-General.

During the fiscal year the sum of $110,584,87 was expended for roads, walks, grading and bridges; $29,120.15 for wharves, and $413,809.6[illegible] for water, sewerage, plumbing, etc.

SUPERIORITY OF HORSES.

The horses purchased for the cavalry and artillery of the Army during the year have been of an unusually good quality, while the prices paid have been reasonable.

From all information obtainable it is known that, in the character of its mount, our Army is now superior to that of any other.

IMPROVED AMBULANCES.

One hundred ambulances of an improved pattern have been constructed under contract and are now ready for issue. These ambulances meet the requirements of the service more fully than any heretofore supplied.

GARBAGE CREMATORS AND SANITARY CARTS.

The collection and disposal of garbage at military posts is a matter so intimately connected with the health and comfort of the garrison that it has received the most careful attention of this department, which has endeavored to keep pace with modern sanitation and its

requirements in all new construction, as well as in renovation and repairs.

At certain posts, where it was found they were imperatively necessary (other methods of disposal of garbage not being feasible), garbage cremators have been constructed on approved plans; the rapid and innocuous destruction of all refuse matter being thus easily accomplished.

As an additional safeguard to health a steel sanitary garbage cart, constructed on a modern system approved by the highest sanitary authorities, has been adopted by the department and supplied, where requisite, to military posts.

With the use of the carts, which are practically air-tight, the collection of garbage, etc., is carried on inoffensively and without danger to health, as it is by the same means in the larger cities.

As an additional safeguard, antiseptic and disinfecting supplies for general post sanitation, are regularly furnished by the medical department.

WHARF IN NEW YORK CITY.

There is an urgent necessity for a Government wharf in New York City, and the need becomes more urgent every year.

The Quartermaster's Department is now paying an annual rental of $11,000 for the use of Pier 3, East River, and other bureaus of the War Department are also disbursing large sums for rent of wharves. These rentals are increasing, rather than decreasing, from year to year.

It would be far more economical and a better policy in every respect, from a business standpoint, for the Government to become the absolute owner of suitable wharf property.

The annual saving in rent would not only be large, but it is also believed that in so important a matter as a landing place for its military stores, etc., the Government should not be subjected to the claims of private ownership.

It is therefore respectfully recommended that authority be asked from Congress to acquire such a wharf property, either by purchase or condemnation.

REGULAR SUPPLIES.

During the fiscal year, 892 cavalry and 83 artillery horses were purchased at an aggregate cost of $119,515.55, and also 33 team horses and 552 mules, costing $96,768.20.

At the close of the last fiscal year there were on hand 6,647 cavalry and artillery horses, 293 team horses, and 3,981 mules.

The sum of $123,355.60 was expended for heating and lighting; $105,824.12 for illuminating supplies; $3,875.77 for veterinary supplies; $12,155.73 for wagons, carts, etc.; $68,928.25 for stoves, ranges and extra parts; $11,232.27 for horse and mule shoes, horseshoe nails, and shoeing tools; $3,439.23 for post bakeries, schools, and gardens; and $4,359.96 for tableware and kitchen utensils.

There was manufactured at the military prison, Fort Leavenworth, Kans., during the year, furniture for stoves and ranges, costing $6,260.73; harness, costing $13,983.90, and mess tables, benches, stools, company field desks, and rope mats, costing $1,552.65.

BARRACKS AND QUARTERS.

By act approved July 16, 1892, Congress appropriated the sum of $700,000, for barracks and quarters for the fiscal year. This amount

was expended in constructing officers' quarters, barracks, storehouses, stables, etc.; for the repair and alteration of buildings, and for rent, etc.

During the fiscal year the sum of $49,800.14 was expended for the construction and repair of hospitals at military posts, and also the sum of $6,921.14, for the construction and repair of hospital stewards' quarters, and $8,000 for shooting galleries and expenses incident thereto.

MILITARY POSTS.

Congress, by act approved August 5, 1892, appropriated the sum of $400,000 "for the construction of buildings at and the enlargement of such military posts as, in the judgment of the Secretary of War, may be necessary," and with the balance of $90,820.96, remaining on hand from previous appropriations, together with the sum of $25,000 from previous allotments for construction at Fort Wayne and Fort Sam Houston, an aggregate of $515,820.96 was available during the fiscal year for the purpose above stated.

Of this sum the following apportionment was made:

Fort Brady, Mich	$52,122.05	Columbus Barracks, Ohio	$2,523.65
Fort Sheridan, Ill	46,569.73	Miscellaneous expenditures at various posts	3,930.85
Fort McKinney, Wyo	50,000.00	Balance on hand June 30, 1893	120,397.30
Fort Ethan Allen, Vt	77,222.50		
Madison Barracks, N. Y	13,298.49		
Fort Crook, Nebr	87,458.70		
Fort Bliss, Tex	52,894.02	Total	515,820.96
Fort Sam Houston, Tex	9,403.67		

A number of the buildings authorized at the posts above mentioned have been completed, and others are in course of erection or contracted for.

FORT CROOK, NEBR.

For this post the expenditures have been as follows: For purchase of site, $66,626.46; water supply and sewer systems, roads, improvement of grounds and miscellaneous objects, $110,001.36; and for barracks, quarters, storehouses, hospital, and other necessary buildings, $297,050.21, making a total expenditure to date of $473,678.03.

The water supply and sewer systems were very carefully planned and have been thoroughly constructed, as was necessary for a permanent post of this size; the grounds well laid out and planted, and a complete system of macadamized roads, thoroughly drained and guttered, has been constructed.

In planning and erecting the buildings, permanency of material, thoroughness of construction, and adaptability have been kept constantly in view, while due attention has been paid to the health and comfort of the garrison by a strict adherence to the best modern sanitary requirements.

The law of Congress fixed the limit of cost at $500,000, but in order to secure the full measure of accommodation required at this post, destined to be one of great importance, it is respectfully recommended that Congress be requested to increase the limit of expenditure which may be made to $750,000.

The act of July 23, 1888, establishing the new post of Fort Crook, also provided for the sale of the site of the old post of Fort Omaha.

This reservation, comprising 82.50 acres, lies within the limits of the city, and the ground has become so valuable that it is estimated that the money realized from its sale will replace the amount expended on the new post.

FORT ETHAN ALLEN, VT.

The act of Congress approved August 5, 1892, authorized the establishment of a military post at a point near the northern frontier, provided that suitable land for the purpose should be donated free of cost to the United States.

The requirements of this law having been complied with by donation of 600 acres of land in Chittenden county, near Essex Junction, Vt., work has been commenced on the roads, water supply, and sewer systems, and the following described buildings have been contracted for and are being constructed:

One double cavalry barrack, brick; two double sets of officer's quarters, brick; guard-house, brick; two cavalry stables, brick; one bake-house, brick; quartermaster's storehouse, brick; frame scale-house, and brick hospital.

On March 13, 1893, the Secretary of War designated this post as Fort Ethan Allen, in compliment to the general of that name whose brilliant service in the War of the Revolution honored the State in which this post is situated.

PLATTSBURG BARRACKS, NEW YORK.

Under the act of Congress approved February 7, 1891, appropriating the sum of $200,000 for beginning work upon the enlargement of this post to the capacity of 12 companies, the following buildings, in addition to the construction of roads, water supply and sewer systems, are approaching completion, viz:

Brick barracks for four companies; mess-hall and administration building, brick; seven double sets of officers' quarters, brick, and brick guard-house, costing in the aggregate the sum of $191,400.

OMAHA DEPOT, NEBRASKA.

The acts of Congress approved August 5, 1892, and March 3, 1893, appropriated the sum of $60,000 for the construction and completion of suitable buildings for a military storehouse and offices at this depot. Proposals for the erection of this building have been received and contracts will be entered into for its construction, including steam heating, plumbing, and lighting, at a cost of $45,540.67.

MILITARY POST NEAR LITTLE ROCK, ARK.

Under the act of Congress approved April 23, 1892, the establishment of an army post within 10 miles of the city of Little Rock, Ark., was authorized, upon the condition that the city convey to the United States the fee simple title to not less than 1,000 acres of land. And by act approved August 5, 1892, it was provided that the sum of $60,000 therein appropriated may be used, in case the Secretary of War shall regard it necessary for the public interests, to commence the erection of buildings thereat when the conditions of the act of April 23, 1892, have been complied with.

The conditions of the act referred to having been complied with, the site of the proposed post, situated in Pulaski County, Ark., and containing 1,100 acres, is being surveyed.

FORT HARRISON, MONT.

The establishment of a military post at or near the city of Helena, in the county of Lewis and Clarke, Mont., was authorized by act of Congress approved May 12, 1892, upon the transfer and conveyance to the United States of a good and sufficient title to not less than 1,000 acres of land without cost to the United States, and the sum of $100,000 was appropriated for the purpose of defraying the expense of locating said post and of constructing the necessary barracks, quarters, hospital, etc.

The requirements of the law as to transfer of the land (1,040 acres) to the United States having been complied with, the work of surveying the reservation is now in progress.

Under the act approved March 3, 1893, the cost of the improvements and buildings at this post is limited to $200,000.

PERMANENT BUILDINGS AT MILITARY POSTS.

Considerations of military efficiency and economy having dictated the policy of drawing in many of the small detachments of the Army, and concentrating them at points commanding extensive lines of communication, the result has been the establishment of several large military posts and the abandonment, either actual or contemplated, of a number of smaller and more isolated ones.

In all places which gave promise of permanency, it has been the aim of this department, as a measure of true economy, to construct buildings of stone, brick or other enduring material; of solid and stable workmanship, and of as agreeable and dignified an appearance as is consistent with the use for which they are intended.

Great care has been taken in the preparation of plans for these buildings, both for officers and men, not only as regards suitability and convenience, but with special care to the best and most approved sanitary requirements and appliances. It is believed that, in all these respects, as well as architecturally, they more than favorably compare with similar military structures in other countries.

In order that this work may be carried on economically and to the best advantage, permanency considered, it is earnestly hoped that Congress will make liberal appropriations therefor.

CONSOLIDATED MESSES AND MESS HALLS.

Mess halls have been erected and are in use at the following posts, viz: Fort Bliss, Fort Brady, Davids Island, Jefferson Barracks, Fort McPherson, Plattsburg Barracks, Fort Riley, Fort Sam Houston, Fort Sheridan, and Fort Thomas. In addition, the consolidated mess has been established at Fort Myer, Key West Barracks, Fort Schuyler, Fort Warren, and Willets Point; accommodations already existing at these posts having been supplemented by this Department, so that the common mess is conveniently carried on.

Like all changes in system, the consolidated mess has its critics as well as defenders. In some instances there has been an apparently unreasoning prejudice on the part of those charged with its supervision, which has impaired its usefulness and delayed success.

It is proper to state, however, that the majority of commanding officers at posts where the system has been fairly tried accord it high praise.

While it seems to be satisfactorily established that the consolidated

mess is excellently adapted for the needs of large posts, no further extension is recommended until time and further trial have removed the objections brought against it.

Among its advantages may be clearly recognized vastly better cooking than is possible in the company mess, an economy in material which results in substantial saving in the ration—a saving which all goes to the improvement of the table—and the consequent betterment of the soldier's condition.

The introduction of better and more scientific cooking in the consolidated mess, through the medium of trained cooks, for whose employment provision should be made by Congress, will result, it is believed, in the gradual adoption throughout the Army of improved methods of preparing food and in the soldier being better fed and, as a consequence, more healthy and contented.

FORT MYER WATER SUPPLY.

The estimates of last year contained an item for supplying Fort Myer with water, by making connection at Georgetown with the large main of the Washington Aqueduct.

This having failed to receive the approval of Congress, and the necessity for an immediate increase in the water supply for the garrison being imperative, the honorable Secretary of War directed that water be taken from the Potomac River, at the south end of the Aqueduct Bridge, whence it is forced through 6-inch iron pipes into tanks at the post.

This arrangement is not entirely satisfactory, and it is hoped that Congress will authorize a connection with the large main of the Washington Aqueduct, in accordance with the original plan, which met the full approval of the Chief of Engineers, and was strongly urged by the Surgeon-General of the Army. The connection can be very easily made, and at slight expense.

The daily consumption of water by the 250 officers and soldiers of the garrison (probably within 40,000 gallons) would be relatively so small as to be insignificant, so far as regards the demand it would make upon the Washington Aqueduct.

Owing to the situation of the post, it has been practically impossible to procure a supply of pure water in any other manner, every known method having been exhausted.

RESERVATIONS.

The following reservations or parts thereof have been transferred to the Interior Department for disposition under the act of Congress approved July 5, 1884:

	Acres.
Oklahoma, Okla	160
St. Marks, Fla	50
Fort Thomas, Ariz	10,487

A tract of land containing 5.516 acres was set aside by letter of the Secretary of the Interior of May 11, 1893, for a hospital site at Fort Yellowstone, Wyo., adjoining the tract of 22.5 acres previously set aside for military purposes.

By authority of the President of May 4, 1893, a tract of 700 acres, more or less, was reserved for military purposes on Anastasia Island, contiguous to St. Augustine, Fla.

NOMENCLATURE OF MILITARY POSTS.

General Order No. 11, of 1832 directed that thereafter all cantonments should be called "forts." With the lapse of time, however, a

contrary practice grew up and, although a partial reform was instituted by General Order 79, of 1878, certain anomalies still exist in the nomenclature of our military posts which might well be corrected, for the sake of uniformity and propriety.

A very large number of military posts have been named from the locality where they are placed, some of which, like Angel Island, Alcatraz Island, Davids Island, San Carlos, and Willets Point, are not dignified by any military appellation which is distinctive. A few posts bear the names of Indian tribes distinguished neither for friendliness nor other good qualities.

We have a presidio (Spanish place of defense, garrison, or guardhouse), which is a relic of the days of easy conquest.

We have named posts after Presidents and princes, general officers and lieutenants, Christian saints and heathen sinners, Spaniards, Frenchmen, and Englishmen, who were in no way distinguished in, or connected with, the civil or military service of the United States; white men and Indians, cities, towns and villages; after mountain peaks and valleys, and river forks and creeks; the greater number being without significance or dignity.

There are still some fifteen permanent posts known as "barracks," a term erroneously applied to a military post which must of necessity comprise a variety of buildings and quarters for officers, as well as barracks for enlisted men.

It is respectfully suggested that the order of 1878 be amended so as to reserve to the Secretary of War the naming of military posts, and to prescribe the prefix "Fort" for all permanent posts; that the title "barracks" be dropped, and that all purely local names be eliminated from the nomenclature of military posts.

A desire to honor the names of brave soldiers has been shown in a few instances. Riley, Clark, Buford, Sill, Robinson, Crook, Whipple, and others were thus honored, while Grant, Sheridan, Thomas, McPherson, Meade, and Sherman have been remembered, and the distinguished Hancock's name has been given to a minor temporary post in Texas.

But there remains on the roll of honor a galaxy of names from which to select; names borne by departed heroes distinguished for brilliant and grand achievements in the service of the Republic. What names more appropriate could be bestowed upon the different military posts of the country? To perpetuate the names of such men is to keep the memory of their deeds ever in the minds of our officers and soldiers.

The following list of military posts is respectfully submitted for consideration in this connection:

Alcatraz Island.
Angel Island.
Fort Apache.
Fort Assinniboine.
Fort Barrancas.
Boise Barracks.
Benicia Barracks.
Columbus Barracks.
Davids Island.
Fort Duchesne.
Eagle Pass.
Fort Huachuca.
Jackson Barracks.
Jefferson Barracks.
Key West Barracks.
Madison Barracks.
Fort Missoula.
Mount Vernon Barracks.
Fort Niobrara.
Fort Pembina.
Plattsburg Barracks.
Presidio of San Francisco.
St. Francis Barracks.
San Carlos.
San Diego Barracks.
Fort Spokane.
Fort Supply.
Vancouver Barracks.
Fort Walla Walla.
Fort Washakie.
Washington Barracks.
Whipple Barracks.
Willets Point.

NATIONAL CEMETERIES.

The military cemetery at Santa Fe, N. Mex., having been declared a national cemetery by the Secretary of War on September 10, 1892, increased the number of such cemeteries at the close of the year to eighty-three, with seventy-three superintendents.

During the fiscal year 9,168 white marble headstones were provided to mark the graves of Union soldiers, sailors, and marines buried in national, post, city, and village cemeteries.

Repairs have been made during the fiscal year to the lodges, outbuildings, inclosing walls, walks, water supply, and drainage, etc., at all of the cemeteries, and the grounds kept in good order.

Contracts have been made for the erection of new brick outbuildings to replace old wooden structures in the national cemeteries at Fort Leavenworth, Kans., Soldiers' Home, District of Columbia, and Culpeper and Yorktown, Va.; also for a stone outbuilding in the Grafton, W. Va., national cemetery.

At the Arlington, Va., national cemetery the mansion and outbuildings have been repaired, and the grounds, drives, drainage, and water supply kept in proper order. Additional drainage and catch basins have been provided for the roadway in the new addition, and a granolithic foot walk laid from the western entrance to connect with the pavement heretofore constructed around the mansion. A contract has also been made for the construction of a receiving vault.

Arrangements have been made with the Cave Hill Cemetery Company, of Louisville, Ky., for the transfer to the United States of a piece of land containing 15,934 square feet, more or less, situated between sections B and C of the Cave Hill National Cemetery grounds, and in which upwards of 200 bodies of Union soldiers were buried in 1868, when removed from the battlefields in that vicinity.

The approach to the national cemetery at Chalmette, La., has been practically demolished for the distance of 1,875 feet to make room for a new levee which was constructed during the past winter by the Engineer Department.

At the Custer Battlefield, Mont., national cemetery, the post and wire fence inclosing the cemetery reservation has been put in thorough repair, and one large gate, with arch, and one small one (turnstile) constructed. Four hundred and seventy-five headstones have been reset in brick and cement, and the "Custer monument" repaired. In consequence of the unprotected condition of the cemetery, visitors and relic-hunters have almost entirely destroyed the headstone marking the place where Gen. Custer fell. It is contemplated to permanently inclose with a brick or stone wall and improve a part of the reservation for cemeterial purposes and to erect a superintendent's lodge. Since the close of the fiscal year a superintendent has been placed in charge of this cemetery.

At the Gettysburg, Pa., national cemetery, the monument erected by the State of New York in memory of the dead of that State who fell in the battle of Gettysburg, July, 1863, has been completed. The monument was dedicated, with appropriate ceremonies, on July 2, 1893, the thirtieth anniversary of the battle.

At the San Francisco, Cal., national cemetery, a granite monument, surmounted by a statue representing a soldier at "parade rest," erected in the cemetery by Geo. H. Thomas Post No. 2, G. A. R., was dedicated with appropriate ceremonies on Memorial Day, May 30.

The sum of $5,030.45 was expended during the past fiscal year in

necessary repairs to roadways to national cemeteries which have been constructed by special authority of Congress.

INACCESSIBILITY OF ARLINGTON PARK AND NATIONAL CEMETERY.

Very large sums have been appropriated by Congress for the construction of roads to cemeteries, more or less unimportant, in various parts of the country; but a like generous care has not been bestowed upon Arlington, the most important of all. The Arlington Heights grounds contain 1,100 acres, with a frontage of about 1 mile on the Potomac. They constitute one of the grandest and most beautiful parks in the country, the national cemetery occupying about one-fifth of the inclosure. In addition to its historical associations, the park abounds in rare natural beauty, and has been most carefully kept and improved. Few cities have so fine a park contiguous to their borders. Arlington Cemetery, where so many heroes lie buried, has in a large measure become, like Great Britain's Westminster Abbey, the nation's "Walhalla." Consecrated as it is to our illustrious dead, with its stately and expressive monuments commemorative of the deeds of patriots, its hallowed associations and its lessons appeal strongly to all visitors to the nation's capital. But the journey thither, by a roundabout way, over roads controlled by local authorities, which are rough at all times, and frequently well-nigh impassable, is not only tedious and uncomfortable, but involves an expenditure of time and money which deters great numbers from undertaking it.

A bridge over the Potomac at or about the terminus of New York avenue, near Observatory Hill, would furnish a short and direct route to the park and cemetery, and would in fact bring them to our very doors. But the park and cemetery are not alone to be considered. As a means of direct and rapid communication between the capital and the important military post of Fort Myer, which adjoins the park on the north, the value, in a military sense, of a bridge at this point can not be overestimated. Such a bridge would also practically join this beautiful park to the large area of reclaimed lands on the river, all of which is to form one grand park. Plans for such a bridge have been prepared by the Engineer Department, and its construction is urged as a necessity. It is respectfully recommended that Congress be requested to make an appropriation therefor.

GETTYSBURG BATTLEFIELD.

Under the acts of Congress approved March 3, 1887, October 2, 1888, and March 2, 1889, authorizing and directing the acquirement of land for sites for monuments or tablets to mark the positions occupied by organizations of the Regular Army on the Gettysburg Battlefield, a survey of the field has been made, the positions of the various commands designated on the ground, and the title papers for the purchase of the sites are now nearly perfected. These sites are generally about 25 feet square, with an approach thereto from the nearest public highway. Contracts have been made for furnishing and putting in place 40 cast-iron tablets with suitable inscriptions, and 25 iron gun carriages to mark these positions. This work is now in progress.

ANTIETAM BATTLEFIELD.

The agents appointed by the honorable Secretary of War to carry out the provisions of the acts of Congress approved August 30, 1890, August 5, 1892, and March 3, 1893, in surveying, locating, and pre-

serving the lines of battle of the Army of the Potomac and of the Army of Northern Virginia, at Antietam, have reported to this office that the work of locating the lines of battle of the armies referred to has progressed favorably during the past fiscal year, and that a series of three maps marking the lines of battle are under way; that the positions of the batteries of both armies have been generally determined upon and a map thereof is being prepared. The agents further report that they have interviewed a number of farmers owning land upon which tablets are to be placed, and found that they are unwilling to sell their land directly, preferring that the same be condemned and appraised by a commission appointed by a United States court.

HALL OF RECORDS.

For many years several of the heads of Departments have made earnest recommendations to Congress to provide for the erection of a suitable fireproof building in this city, wherein could be filed the greater portion of the vast accumulation of vouchers and other valuable papers. These files, aggregating an enormous mass of papers, encumber the Department buildings, occupying valuable space costing millions of dollars which ought to be available for office purposes, and besides, in several of the buildings where stored, their great weight is a constant menace to the safety of the structures and to the lives of the employés.

In 1880, Maj. Gen. Meigs, then Quartermaster-General, urgently presented the necessity for such a building, and submitted a complete plan for a suitable structure to cost $200,000. The plan is on file in this Department.

The crowded condition of the Executive Departments, especially of the War Department, where a large number of costly rooms are packed with vouchers and other valuable papers from floor to ceiling, and the constant increase in rented premises necessary to accommodate the business of the Government, would seem to point to the present as a suitable time for the consideration of this important matter.

RECORDS.

The "card system" of keeping the records of the office has continued satisfactorily during the past fiscal year, and the current work has been transacted with promptness.

Very respectfully,

R. N. BATCHELDER,
Quartermaster-General, U. S. Army.

Hon. DANIEL S. LAMONT,
Secretary of War.

List of papers accompanying the annual report of the Quartermaster-General for the fiscal year ending June 30, 1893.

1. Report of Lieut. Col. M. I. Ludington, Deputy Quartermaster-General, U. S. Army, of the operations of the inspection branch of the Quartermaster-General's Office during the fiscal year ending June 30, 1893.
2. Report of Lieut. Col. M. I. Ludington, Deputy Quartermaster-General, U. S. Army, of the operations of the finance branch of the Quartermaster-General's Office during the fiscal year ending June 30, 1893.
3. Report of Lieut. Col. M. I. Ludington, Deputy Quartermaster-General, U. S. Army, of the operations of the money and property accounts branch of the Quartermaster-General's Office during the fiscal year ending June 30, 1893.

A. Statement showing number of money accounts and returns of quartermaster's stores received and disposed of during the fiscal year ending June 30, 1893.

B. Statement showing the amount received from sales of quartermaster's stores to officers and soldiers during the fiscal year ending June 30, 1893.

C. Statement showing in detail the amounts expended from the various appropriations made for the Quartermaster's Department for the fiscal year 1893, as shown by the accounts of officers, from July 1, 1892, to July 1, 1893, and, so far as accounts have been received in this office, up to and including July 28, 1893, and supplemental pertaining to the fiscal year ending June 30, 1892.

D. Statement showing number of civilian employés employed by the month, as reported by officers of the Quartermaster's Department on the latest reports of persons received.

E. Statements of amounts expended by each officer serving in the Quartermaster's Department during the fiscal year ending June 30, 1893.

4. Report of Lieut. Col. M. I. Ludington, Deputy Quartermaster-General, U. S. Army, of the operations of the clothing and equipage returns branch of the Quartermaster-General's Office during the fiscal year ending June 30, 1893.

5. Report of Lieut. Col. M. I. Ludington, Deputy Quartermaster-General, U. S. Army, of the operations of the clothing supply branch of the Quartermaster-General's Office during the fiscal year ending June 30, 1893.

A. Statement showing articles of clothing and equipage and materials on hand at the issuing depots of the Quartermaster's Department June 30, 1892, the quantities purchased, manufactured, received from posts and depots, taken up, sold, transferred to general depots, expended, issued to the Army and militia, and the quantities remaining in the depots June 30, 1893.

6. Report of Lieut. Col. M. I. Ludington, Deputy Quartermaster-General, U. S. Army, relating to the care and maintenance of national cemeteries during the fiscal year ending June 30, 1893.

A. Statement of disbursements of appropriation "National cemeteries" during the fiscal year ending June 30, 1893.

7. Report of Maj. A. S. Kimball, quartermaster, U. S. Army, of the operations of the transportation and regular supplies branches of the Quartermaster-General's Office during the fiscal year ending June 30, 1893.

8. Report of Capt. W. S. Patten, assistant quartermaster, U. S. Army, of the operations of the miscellaneous claims branch, mail and record division, and claims under act July 4, 1864, branch, of the Quartermaster-General's Office during the fiscal year ending June 30, 1893.

9. Report of Capt. C. P. Miller, assistant quartermaster, U. S. Army, of the operations of barracks and quarters branch of the Quartermaster-General's Office during the fiscal year ending June 30, 1893.

A. Statement showing property rented by the Quartermaster's Department during the fiscal year ending June 30, 1893.

10. Report of Capt. O. F. Long, assistant quartermaster, U. S. Army, of the operations of the reservation branch of the Quartermaster-General's Office during the fiscal year ending June 30, 1893.

A. Statement of expenditures authorized for water, sewerage, plumbing, etc., chargeable to appropriation for "Army transportation," for the fiscal year ending June 30, 1893.

B. Statement of expenditures authorized for lighting, heating etc., chargeable to the appropriation for regular supplies, for the fiscal year ending June 30, 1893.

C. Statement showing military reservations turned over to the Interior Department or otherwise disposed of since 1858.

D. Statement giving alphabetical list of military reservations, showing location, size, how occupied, accommodations for officers and men, etc., on June 30, 1893.

1.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., July 20, 1893.

GENERAL: I have the honor to submit a report of the operations of the inspection branch of this office for the fiscal year ending June 30, 1893.

In this branch the necessary and appropriate action is taken in all matters which pertain to the personnel of the officers of the Quarter-

master's Department, their assignment to stations, etc., and also to matters which relate to the clerks and others employed in the office of the Quartermaster-General and in the Quartermaster's Department at large. The biennial and annual reports, monthly return of officers of the Quartermaster's Department, monthly and semimonthly pay rolls of the employés in this office, and the semiannual clerks efficiency report, are all prepared therein. Action is also taken on all matters relating to post quartermaster sergeants, and to the detachment of Army service men, Quartermaster's Department, at West Point, N. Y.

The full complement of post quartermaster sergeants authorized by law (80) are in the service, and during the past fiscal year have generally performed satisfactory service.

The detachment of army service men, Quartermaster's Department, serving at West Point, N. Y., is composed of 117 men. Capt. W. H. Miller, Assistant Quartermaster, the officer commanding this detachment, reports that the members of this organization have performed their duties during the fiscal year satisfactorily and efficiently.

At the beginning of the fiscal year July 1, 1892, the number of men in the detachment was	116
Number of men transferred and discharged during fiscal year ending June 30, 1893	27
	89
Number of men enlisted in and transferred to the detachment during the fiscal year ending June 30, 1893	24
	113
Number of vacancies existing in detachment June 30, 1893	4
	117

Capt. Miller states that out of the 117 men composing this detachment there are at present 63 men who are available for work in the Quartermaster's Department, viz, 21 mechanics, 18 laborers, 18 teamsters, and 6 overseers, the remainder performing various other duties that render them unavailable for purposes of policing and repairs at the post.

He further reports that by reason of the enlargement of the post by the erection of new buildings, extension of the sewer, water and gas pipes, etc., the demand upon this detachment for service of mechanics, laborers, etc., has very much increased, in view of which he recommends that the present enlisted force of this detachment be increased from 117 to 150 men.

In September, 1892, the Quartermaster-General, in forwarding to the Adjutant-General of the Army a communication from Capt. W. H. Miller for increase of this detachment, remarked that in his opinion it is questionable whether under existing laws the number composing this detachment as now constituted (117 men) can be increased without further legislation by Congress. It further appears that on November 12, 1892, the Acting Judge-Advocate-General, in submitting his opinion on this subject to the Secretary of War, held that in the absence of legislation there is no authority for the increase of the strength of said detachment.

The distribution of books, orders, circulars, and other printed matter intended for use of the officers of the Quartermaster's Department is also made from this branch, and during the past fiscal year 115,901 of such orders, books, etc., were so distributed.

The officers of the Quartermaster's Department, regular establishment, are as follows: 1 Quartermaster-General, 4 Assistant Quarter-

masters-General, 8 Deputy Quartermasters-General, 14 Quartermasters, 30 assistant quartermasters, 2 military storekeepers; total, 59.

Very respectfully,

M. I. LUDINGTON,
Deputy Quartermaster-General, U. S. Army.

The QUARTERMASTER-GENERAL.

2.

Annual report of the finance branch for the fiscal year ending June 30, 1893.

This branch has charge of matters relating to the procurement and distribution of funds, the compilation and preparation for Congress of the annual estimates of funds for the service of the Quartermaster's Department, and for funds required for the Quartermaster-General's office; the examination of estimates of funds received from disbursing officers, and the issue of requisitions in favor of such disbursing officers; the action upon settlements made at the Treasury of claims and accounts pertaining to the Quartermaster's Department; the abstracting of weekly and monthly statements of funds for comparison with the Treasury records; and the conducting of the necessary correspondence and the keeping of the prescribed records and the necessary memorandum books connected with foregoing.

From the balance books, upon which all debits and credits are recorded, the following statement has been prepared:

Appropriations.	Balance in Treasury undrawn July 1, 1892.	Appropriated.		Placed to credit of appropriations during the year, being the proceeds of sales to officers, etc.	Placed to credit of appropriations by Treasury transfer warrants.	Total to be accounted for.	Remitted to disbursing officers.	Requisitions issued on settlements made at Treasury of claims and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund, act June 20, 1874.	Balance in Treasury undrawn June 30, 1893, and available for outstanding obligations.	Total accounted for.
		Amount.	Date of act.									
1871 and prior years, transfer account.												
Transportation of officers and their baggage				$8.44		$8.44			$8.44			$8.44
1888–'89.												
Shooting galleries and ranges	$4,496.05					4,496.05				$4,496.05		4,496.05
1889–'90.												
Transportation of the Army and its supplies		$112,226.04	July 28, 1892			112,226.04		$109,228.83			$2,997.21	112,226.04
Construction and repair of hospitals		34.43	do			34.43		34.43				34.43
Total		112,260.47				112,260.47		109,263.26			2,997.21	112,260.47
1890 and prior years.												
Regular supplies				4,613.41		4,613.41				4,613.41		4,613.41
Incidental expenses				1,830.22		1,830.22				1,830.22		1,830.22
Transportation of the Army and its supplies				3,968.00		3,968.00				3,968.00		3,968.00
Clothing, camp and garrison equipage				175.47		175.47				175.47		175.47
Total				10,587.10		10,587.10				10,587.10		10,587.10

Annual report of the finance branch for the fiscal year ending June 30, 1893—Continued.

Appropriations.	Balance in Treasury undrawn July 1, 1892.	Appropriated.		Placed to credit of appropriations during the year, being the proceeds of sales to officers, etc.	Placed to credit of appropriations by Treasury transfer warrants.	Total to be accounted for.	Remitted to disbursing officers.	Requisitions issued on settlements made at Treasury of claims and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund, act June 20, 1874.	Balance in Treasury undrawn June 30, 1893, and available for outstanding obligations.	Total accounted for.
		Amount.	Date of act.									
1890 and prior years, transfer account.												
Regular supplies				$1,429.13		$1,429.13		$73.96	$1,355.17			$1,429.13
Incidental expenses				62.45	$296.50	358.95		358.95				358.95
Horses for cavalry and artillery				391.59		391.59			391.59			391.59
Barracks and quarters				40.00		40.00			40.00			40.00
Transportation of the Army and its supplies				1,680.41		1,680.41			1,680.41			1,680.41
National cemeteries					3.00	3.00		3.00				3.00
Total				3,603.58	299.50	3,903.08		435.91	3,467.17			3,903.08
1891 and prior years, transfer account.												
Transportation of the Army and its supplies				27.32		27.32			27.32			27.32
1890–'91.												
Regular supplies	$317,642.00			1,863.41		319,505.41		1,785.85		$317,719.56		319,505.41
Incidental expenses	23,404.20			550.41		23,954.61	$9,911.36	895.05		13,148.20		23,954.61
Horses for cavalry and artillery	22,331.66			686.00		23,017.66				23,017.66		23,017.66
Barracks and quarters	1,799.89			1,216.96		3,016.85		45.00		2,971.85		3,016.85
Transportation of the Army and its supplies	272,654.15			8,201.84		280,855.99	10,808.20	99,507.18		170,540.61		280,855.99
Clothing, camp and garrison equipage	8,820.65			808.60		9,629.25		67.62		9,561.63		9,629.25
Construction and repair of hospitals	190.06	$1,536.82	July 28, 1892	212.71		1,939.59		1,536.82			$402.77	1,939.59
National cemeteries	73.27			.21		73.48		73.48				73.48
Pay of superintendents of national cemeteries	413.17					413.17				413.17		413.17

Shooting galleries and ranges	202.96					202.96				202.96		202.96
Quarters for hospital stewards	527.90			13.54		541.44				541.44		541.44
Total	648,059.91	1,536.82		13,553.68		663,150.41	20,719.56	103,911.00		538,117.08	402.77	663,150.41
1891-'92.												
Regular supplies	245,433.31			78,678.82		324,112.13	82,039.77	5,389.58			236,682.78	324,112.13
Incidental expenses	25,126.72			16,567.08		41,693.80	4,424.68	172.58			37,096.54	41,693.80
Horses for cavalry and artillery	47,222.41			2,582.84		49,805.25	5,045.35				44,759.90	49,805.25
Barracks and quarters	73,243.13			6,054.05		79,297.18	72,065.45	308.50			6,923.23	79,297.18
Transportation of the Army and its supplies	504,620.03			94,561.11		599,181.14	345,419.54	69,455.82			184,305.78	599,181.14
Clothing, camp and garrison equipage	132,317.52			140,426.36		272,743.88	239,801.78	22.20			32,919.90	272,743.88
Construction and repair of hospitals	13,210.10			1,755.77		14,965.87	13,248.80	212.71			1,504.36	14,965.87
National cemeteries	1,060.82			120.77		1,181.59	520.29	359.95			301.35	1,181.59
Pay of superintendents of national cemeteries	918.33			31.17		949.50					949.50	949.50
Shooting galleries and ranges	28.41			203.13		231.54	25.51				206.03	231.54
Quarters for hospital stewards	1,300.48			77.13		1,377.61	1,236.50	13.54			127.57	1,377.61
Total	1,044,481.26			341,058.23		1,385,539.49	763,827.67	75,934.88			545,776.94	1,385,539.49
1892-'93.												
Regular supplies		2,575,000.00	July 16, 1892	131,724.97		2,706,724.97	2,362,060.69	781.70			343,882.58	2,706,724.97
Incidental expenses		650,000.00	do	988.95		650,988.95	627,037.10	1.67			23,950.18	650,988.95
Horses for cavalry and artillery		135,000.00	do	400.00		135,400.00	123,145.03				12,254.97	135,400.00
Barracks and quarters		700,000.00	do	764.77		700,764.77	617,938.78				82,825.99	700,764.77
Transportation of the Army and its supplies		2,700,000.00	do	37,295.56		2,737,295.56	2,196,827.17	10,719.93			529,748.46	2,737,295.56
Clothing, camp and garrison equipage		1,200,000.00	do	325,705.32		1,525,705.32	1,301,285.23				224,420.09	1,525,705.32
Construction and repair of hospitals		50,000.00	do	111.71		50,111.71	50,079.63	32.08				50,111.71
National cemeteries		100,000.00	Aug. 5, 1892			100,000.00	97,848.83				2,151.17	100,000.00
Pay of superintendents of national cemeteries		61,880.00	do			61,880.00	61,058.67	65.00			756.33	61,880.00
Shooting galleries and ranges		8,000.00	July 16, 1892	.61		8,000.61	7,999.14				1.47	8,000.61
Quarters for hospital stewards		7,000.00	do	22.54		7,022.54	5,852.01				1,170.53	7,022.54
Total		8,186,880.00		497,014.43		8,683,894.43	7,451,132.28	11,600.38			1,221,161.77	8,683,894.43

Annual report of the finance branch for the fiscal year ending June 30, 1893—Continued.

Appropriations.	Balance in Treasury undrawn July 1, 1892.	Appropriated. Amount.	Appropriated. Date of act.	Placed to credit of appropriations during the year, being the proceeds of sales to officers, etc.	Placed to credit of appropriations by Treasury transfer warrants.	Total to be accounted for.	Remitted to disbursing officers.	Requisitions issued on settlements made at Treasury of claims and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund, act June 20, 1874.	Balance in Treasury undrawn June 30, 1893, and available for outstanding obligations.	Total accounted for.
Certified claims.												
Regular supplies		$1,413.22 4,190.90	July 28, 1892 Mar. 3, 1893			$5,604.12		$5,604.12				$5,604.12
Incidental expenses		7,787.58 1,841.88	July 28, 1892 Mar. 3, 1893			9,629.46		9,626.35		$3.11		9,629.46
Horses for cavalry and artillery		540.25 40.00	July 28, 1892 Mar. 3, 1893			580.25		580.25				580.25
Barracks and quarters		1,080.09	July 28, 1892			1,080.09		1,080.09				1,080.09
Transportation of the Army and its supplies	$1.011.82	24,131.62 13,488.69	....do Mar. 3, 1893			38,632.13		37,608.06		12.25	$1,011.82	38,632.13
Clothing, camp and garrison equipage		17.50	July 28, 1892			17.50		17.50				17.50
National cemeteries		8.25	....do			8.25		8.25				8.25
20 per cent additional compensation		417.73 167.06	....do Mar. 3, 1893			584.79		584.79				584.79
50 per centum of arrears of Army transportation due certain land-grant railroads		2,781.81 321.91	July 28, 1892 Mar. 3, 1893			3,103.72		3,103.72				3,103.72
Total	1,011.82	68,228.49				59,240.31		58,213.13		15.36	1,011.82	59,240.31
Indefinite, or special.												
Awards to certain citizens of Jefferson Co., Ky		1,472.00	Mar. 3, 1893			1,472.00		1,472.00				1,472.00
Approaches to the national cemetery—												
Culpeper, Va	.24					.24				.24		.24
Near Danville, Va	442.28					442.28				442.28		442.28
Barracks and quarters, Fort Myer, Va	7.00					7.00				7.00		7.00

Battle lines and sites for tablets, at Antietam	7,500.00	16,310.00	Aug. 5, 1892			23,810.00	4,500.00				19,310.00	23,810.00
		500.00	July 28, 1892									
Burial of indigent soldiers		1,500.00	Aug. 5, 1892			3,000.00	3,000.00					3,000.00
		1,000.00	Mar. 3, 1893									
Headstones for graves of soldiers	46,020.09	10,000.00	Aug. 5, 1892	4.25		56,024.34	28,221.05	492.21			27,311.08	56,024.34
Levee at Brownsville national cemetery, Tex	243.00					243.00				243.00		243.00
Military posts	281,603.30	400,000.00	Aug. 5, 1892	3,704.72		685,308.02	354,256.25	4,450.22			326,601.55	685,308.02
Military post—												
Near Newport, Ky., site	138.05					138.05				138.05		138.05
Near Newport, Ky., buildings	13,339.51					13,339.51					13,339.51	13,339.51
At Fort Omaha, Nebr.	98,733.54					98,733.54	27,000.00				71,733.54	98,733.54
Near Chicago, Ill	346.66					346.66				346.66		346.66
Fort Bliss, Tex	144,549.31					144,549.31	143,720.00				829.31	144,549.31
Fort Sidney, Nebr	15,004.86					15,004.86					15,004.86	15,004.86
Atlanta, Ga	75,000.00					75,000.00					75,000.00	75,000.00
Fort Snelling, Minn	15,000.00					15,000.00					15,000.00	15,000.00
Near Denver, Colo	5.83					5.83				5.83		5.83
Plattsburg, N. Y	200,000.00					200,000.00	25,150.00				174,850.00	200,000.00
Eagle Pass, Texas Site	20,000.00					20,000.00					20,000.00	20,000.00
Helena, Montana	100,000.00					100,000.00					100,000.00	100,000.00
Military store house, Omaha, Nebr		30,000.00	Aug. 5, 1892			30,000.00					30,000.00	30,000.00
Monuments or tablets at Gettysburg				13,786.60		13,786.60	500.00				13,286.60	13,786.60
Officers' quarters, military post at Columbus, Ohio	471.90					471.90					471.90	471.90
Payment to Oregon Improvement Company for damages to steamer Willamette, in San Francisco harbor, by Government steamer General McDowell		448.15	Mar. 3, 1893			448.15		448.15				448.15
Purchase of—												
Buildings at military posts	9,727.48			600.00		10,327.48	350.00				9,977.48	10,327.48
Land for target ranges, Fort McPherson, Ga	16,500.00					16,500.00					16,500.00	16,500.00
Fort Brown Reservation, Tex	160,000.00					160,000.00					160,000.00	160,000.00
Road from—												
Alexandria to the national cemetery, Virginia	3.84					3.84				3.84		3.84

Annual report of the finance branch for the fiscal year ending June 30, 1893—Continued.

Appropriations.	Balance in Treasury undrawn July 1, 1892.	Appropriated.		Placed to credit of appropriations during the year, being the proceeds of sales to officers, etc.	Placed to credit of appropriations by Treasury transfer warrants.	Total to be accounted for	Remitted to disbursing officers.	Requisitions issued on settlements made at Treasury of claims and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund, act June 20, 1874.	Balance in Treasury undrawn June 30, 1893 and available for outstanding obligations.	Total accounted for.
		Amount.	Date of act.									
Indefinite or special—Ct'd.												
Road from—												
Antietam to the national cemetery, Maryland	3.12					3.12				3.12		3.12
Corinth to the national cemetery, Mississippi				164.13		164.13				164.13		164.13
Florence to the national cemetery, South Carolina				547.08		547.08				547.08		547.08
Marietta to the national cemetery, Georgia				10.17		10,17		10.17				10.17
Natchez to the national cemetery, Mississippi	83.65			11.88		95.53		1.45		94.08		95.53
Newbern to the national cemetery, North Carolina	9.95					9.95				9.95		9.95
Staunton to the national cemetery, Virginia	234,81					234.81				234.81		234.81
Road to the national cemetery—												
Presidio, San Francisco, Cal	1,000.00	10,000.00	Aug. 5, 1892			11,000.00	7,320.00				3,680.00	11,000.00
At Hampton, Va	2,000.00					2,000.00					2,000.00	2,000.00
Near Beverly, N. J	451.44					451.44				451.44		451.44
Near Fredericksburg, Va	1.35					1.53				1.35		1.35
Port Hudson, La				31.81		31.81				31.81		31.81
Road from national cemetery near Mound City to Mounds Junction, Ill	10,000.00					10,000.00	10,000.00					10,000.00

Repairing roads to national cemeteries	18,212.11	10,000.00	Aug. 5, 1892			28,212.11	6,122.34				22,089.77	28,212.11
Rifle range, Fort Sheridan, Ill	8.83	90.00	July 28, 1892			98.83		90.00		8.83		98.83
Tents for sufferers from floods in Arkansas, Mississippi, and Louisiana	1.12					1.12				1.12		1.12
Water supply, Fort D. A. Russell, Wyo	2,958.15					2,958.15					2,958.15	2,958.15
Total indefinite	1,239,601.42	481,320.15		18,860.64		1,739,782.21	609,139.64	7,964.20		2,734.62	1,119,943.75	1,739,782.21
Army transportation Pacific roads.												
					128.98	128.98		128.98				128.98
1890 and prior years				453.53	144,759.42	145,212.95		145,212.95				145,212.95
1891				140.22	109,052.57	109,192.79		109,192.79				109,192.79
1892					6,989.33	6,989.33		6,989.33				6,989.33
1893												
Total				593.75	260,930.30	261,524.05		261,524.05				261,524.05
Grand total	2,937,650.46	8,840,225.93		885,307.17	261,229.80	12,924,413.36	8,844,819.15	628,846.81	3,502.93	555,950.21	2,891,294.26	12,924,413.36

NOTE.—The books of this office show that the entire sum of $3,612, appropriated for "Claims for quartermasters' stores and commissary supplies" by act of July 2, 1892, has been paid out on settlements made at Treasury. Of the sum of $44,572.28 appropriated by acts of July 28, 1892, and March 3, 1893, for "Horses and other property lots in the military service" (certified claims) the books of this office show the remittance to disbursing officers of $36,438.55, and $528.80 has been paid out on settlements made at Treasury. The records of this office show that of the amounts appropriated for "Claims for quartermasters, stores and commissary supplies," acts of July 19, 1876, March 1, 1883, July 5, 1884, and February 20, 1886, $135, $123, $282·32 and $60, respectively, have been paid out on settlements made at Treasury.

The records of this branch show the following amounts remitted from regular and from indefinite or special appropriations:

Remitted from regular appropriations.

Divisions, departments, etc.	Regular supplies.	Incidental expenses.	Horses for cavalry and artillery.	Barracks and quarters.	Transportation of the Army and its supplies.	Clothing, camp and garrison equipage.	Construction and repair of hospitals.	National cemeteries.	Pay of superintendents of national cemeteries.	Shooting galleries and ranges.	Quarters for hospital stewards.	Total.
Department of the East	$264,355.62	$75,322.06	$610.00	$128,054.80	$228,290.10	$533.25	$11,438.65			$991.33	$1,904.70	$711,500.51
Department of the Missouri	302,844.07	68,327.00	3,131.00	80,666.77	186,136.08	122.58	2,138.43	$24.00		3,700.37	18.02	647,108.32
Department of Texas	127,007.89	37,881.77	16,904.30	54,564.61	124,630.85	106.50	1,615.26			656.66	294.78	363,662.62
Department of the Platte	329,475.85	62,070.13	22,393.58	59,814.15	290,872.39	117.00	3,582.46			647.86	1,950.16	770,923.58
Department of Dakota	387,131.49	57,034.09	21,869.00	43,520.02	226,526.20	1,116.80	14,611.18	500.00		490.09	550.99	753,349.86
Department of California	94,077.78	25,940.16	5,535.00	40,339.55	72,726.71	78.00	928.91			486.26	163.10	240,275.47
Department of the Columbia	127,214.10	25,044.52	2,781.28	26,158.49	61,416.71	8.00	949.11			325.41	54.08	243,951.70
Department of Arizona	355,807.95	41,793.21		47,334.09	153,941.18		2,158.32			701.16	106.85	601,842.76
Depot at New York	70,749.74	34,631.07	550.00	3,385.50	157,977.07			3,375.11	$900.00			271,568.49
Depot at Philadelphia	9,056.76	25,108.26		2,685.11	51,230.58	1,026,455.38		2,453.03	2,270.67			1,119,259.79
Depot at Washington	26,291.44	29,800.73		29,352.19	95,141.58		75.00	52,624.26	21,060.00			254,345.20
Depot at Jeffersonville	79,034.35	29,563.09		1,240.00	94,905.33	97,137.33		2,465.15	3,840.00			308,185.25
Depot at St. Louis	9,132.90	20,653.44	49,370.87	6,867.59	142,892.91	5,847.99		8,149.66	10,784.00			253,699.36
Depot at San Francisco	18,920.65	18,460.22		13,389.96	45,145.05	157,612.94		681.84	720.00			254,930.66
Columbus Barracks, Ohio	17,081.48	7,044.15		7,701.75	25,013.28		3,274.24				726.33	60,841.23
Jefferson Barracks, Mo	24,777.37	9,238.29		16,793.25	22,768.50	12.25					78.00	73,667.66
West Point, N. Y	33,552.25	10,533.87			4,826.20	5.00						48,917.32
Willets Point, New York Harbor	2,284.42	2,000.00		2,105.82	4,890.99	10.00	47.75				5.00	11,343.98
Davids Island, New York Harbor	2,663.75	4,164.26		8,153.28	13,219.50		44.15					28,244.94
Military Prison, Kansas	9,257.77	2,506.90			8,433.92	12,122.21						32,320.80
Springfield Armory, Massachusetts	1,795.91	333.30			352.35							2,481.56
Hot Springs, Ark	5,391.12	2,708.00			1,297.09		1,572.77					10,968.98
Atlanta, Ga. (cemeterial)	1,797.66	3,040.25		250.00	95.41			22,461.59	17,894.00			45,538.91
Powder depot, New Jersey	136.08											136.08
Fort McPherson	995.70	3,133.60		3,121.00	6,558.05			4,614.19	3,590.00			22,012.54
Fort Sheridan	3,611.53	5,972.30		3,014.00	32,777.33		6,443.40					51,818.56
Fort Thomas	32.60	724.12		701.44	2,149.00							3,607.16
Fort Brady	3,336.38	3,471.00		360.00	7,918.63							15,086.01
Fort Bliss	9,256.12	1,957.46		474.00	8,955.75							20,643.33
Fort Riley	7,698.75	3,906.40			11,224.00							22,829.15
Fort Barrancas	11.20	1,566.37		585.77	34,263.58							36,426.92
Fort Ethan Allen	463.29	1,133.60		69.66	22,143.30							23,809.85
Plattsburg Barracks	1,064.25	6,316.75			30,639.52							38,020.52
Madison Barracks	22,872.07	3,650.33		5,811.28	21,378.48							53,712.16
Key West Barracks	158.40	1,269.96		31,424.70	615.75		1,200.00					34,668.81
Allegheny Arsenal	807.35				89.							897.01

Augusta Arsenal	971.67	38.50			60.00							1,070.17
Benicia Arsenal	1,895.71	152.55			540.00							2,588.26
Columbia Arsenal	889.07	28.85			116.57							1,034.49
Frankford Arsenal					999.96							999.96
Indianapolis Arsenal	349.65											349.65
Kennebec Arsenal	1,300.00	15.00			75.00							1,390.00
Rock Island Arsenal	1,602.69	130.85			2,169.76			500.00				4,403.30
Watertown Arsenal	2,520.37	73.65			930.87							3,524.89
Watervliet Arsenal	2,385.49	297.04			491.98							3,174.51
Total	2,362,060.69	627,037.10	123,145.03	617,938.78	2,196,827.17	1,301,285.23	50,079.63	97,848.83	61,058.67	7,999.14	5,852.01	7,451,132.28

Remitted from indefinite or special appropriations.

Divisions, depots, etc.	Military posts.	Headstones for graves of soldiers.	Purchase of buildings at military posts.	Military post at Fort Omaha, Nebr.	Repairing roads to national cemeteries.	Road from national cemetery, Mound City to Mounds Junction, Ill.	Horses and other property lost in the military service.
Department of the East		$7.00					
Department of the Missouri	$38,986.51		$350.00				
Department of Texas	9,403.67						
Department of Platte	27,713.20			$25,000.00			
Department of Columbia		19.50					
Depot at New York		27,919.55					
Depot at Washington		275.00			$4,466.92	$10,000.00	$36,438.55
Depot at St. Louis					1,502.42		
Depot at San Francisco							
Columbus Barracks, Ohio	24,304.79						
Willets Point, New York Harbor	12,800.00						
Fort Sheridan, Ill	53,120.53						
Fort McPherson, Ga	1,446.69						
Fort Brady, Mich	63,882.59						
Fort Bliss, Tex	39,000.00						
Fort Riley, Kans	10,955.00						
Fort Crook, Nebr	675.00			2,000.00			
Fort Barrancas, Fla	11.20						
Fort Ethan Allen, Vt	20,000.00						
Plattsburg Barracks, N. Y	182.75						
Madison Barracks N. Y	51,774.32						
Atlanta, Ga. (cemeterial)					153.00		
Total	354,256.25	28,221.05	350.05	27,000.00	6,122.34	10,000.00	36,438.55

Divisions, depots, etc.	Burial of indigent soldiers.	Battle lines and sites for tablets at Antietam.	Monuments or tablets at Gettysburg.	Road to the national cemetery, Presidio of San Francisco, Cal.	Military post, Fort Bliss, Tex.	Military post, Plattsburg, N. Y.	Total.
Department of the East							$7.00
Department of the Missouri							39,336.51
Department of Texas							9,403.67
Department of Platte							52,713.20
Department of Columbia							19.50
Depot at New York							27,919.55
Depot at Washington	$3,000.00	$4,500.00	$500.00				59,180.47
Depot at St. Louis							1,502.42
Depot at San Francisco				$7,320.00			7,320.00
Columbus Barracks, Ohio							24,304.79
Willets Point, New York Harbor							12,800.00
Fort Sheridan, Ill							53,120.53
Fort McPherson, Ga							1,446.69
Fort Brady, Mich							63,882.59
Fort Bliss, Tex					$143,720		182,720.00
Fort Riley, Kans							10,955.00
Fort Crook, Nebr							2,675.00
Fort Barrancas, Fla							11.20
Fort Ethan Allen, Vt							20,000.00
Plattsburg Barracks, N. Y						$25,150	25,332.75
Madison Barracks, N. Y							51,774.32
Atlanta, Ga. (cemeterial)							153.00
Total	3,000.00	4,500.00	500.00	7,320.06	143,720	25,150	646,578.19

Respectfully submitted.

M. I. LUDINGTON,
Deputy Quartermaster-General, U. S. Army.

QUARTERMASTER-GENERAL'S OFFICE, *July 19, 1893.*

3.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., July 28, 1893.

GENERAL: I have the honor to submit a report of the operations of the money and property branch of this office during the fiscal year 1893.

The duties of this branch are the administrative examination of the money accounts and returns of quartermaster's stores rendered by officers serving in the Quartermaster's Department before their transmission to the accounting officers for final action.

It also takes action on certificates of deposits of funds pertaining to the appropriations for the Quartermaster's Department received from sales to officers and soldiers, sales at auction and other sources, and upon boards of survey and inventory and inspection reports of quartermaster's stores no longer fit for issue or use.

The accompanying statements exhibit in detail the work of the branch, and are marked:

A.—A statement showing number of accounts and returns examined, etc.

B.—Statement showing the amounts received from sales of quartermaster's stores to officers and soldiers.

C.—A statement showing in detail the amounts expended under the various heads of appropriation for the fiscal year 1893, and supplement pertaining to fiscal year ended June 30, 1892.

D.—A statement showing the number of civilians employed by the month, etc.

E.—A statement of amounts expended by each officer serving in the Quartermaster's Department.

Very respectfully,

M. I. LUDINGTON,
Deputy Quartermaster-General, U. S. Army.

The QUARTERMASTER-GENERAL, U. S. ARMY.

A.—*Statement showing the number of money accounts and returns of quartermaster's stores received and disposed of during the fiscal year ending June 30, 1893.*

MONEY ACCOUNTS.

On hand July 1, 1892	1,505
Received during the year	2,415
Total	3,920
Examined and sent to the auditor	2,586
Remaining on hand July 1, 1893	1,334

PROPERTY RETURNS.

On hand July 1, 1892	2,065
Received during the year	3,137
Total	5,202
Examined and sent to the auditor	3,382
Remaining on hand July 1, 1893	1,820

B.—*Statement showing the amount received from sales of quartermaster's stores to officers and soldiers of the Army during the fiscal year ending June 30, 1893.*

From returns made to date there has been received from such sales	$168,454.54
This amount has been credited to appropriations as follows:	
Regular supplies	$134,696.28
Incidental expenses	8.90
Cavalry and artillery horses	400.00
Transportation of the Army	710.21
Clothing and equipage	32,639.15
Total	168,454.54

C.—*Statement showing in detail the amounts expended from the various appropriations independent posts, and departments of the Army, as shown by the accounts of officers from and including July 28, 1893.*

General depots, independent posts, etc., and departments.	REGULAR SUPPLIES.					
	Forage and straw.	Fuel.	Heating and cooking apparatus, and repairs to same.	Illuminating supplies.	Stationery.	Advertising.
General depots.						
New York, N. Y	$3,549.61	$19,843.37	$5,202.56	$13,139.25	$10,824.15	$540.80
Philadelphia, Pa	1,229.16	2,037.83	235.40	650.26	750.32	63.15
Washington, D. C	54,950.06	22,551.46	132.85	701.25	782.17	79.21
Jeffersonville, Ind	573.93	3,725.88	7,195.04	37,415.36	5,843.74	192.18
San Francisco, Cal	1,585.41	5,521.66	2,612.46	817.19	1,701.73	25.20
St. Louis, Mo	1,599.01	1,454.75	1,964.74	191.66	538.17	.....
Total	63,487.18	55,134.95	17,343.05	52,914.97	20,440.28	900.54
Independent posts, recruiting stations, armories, arsenals, etc.						
Columbus Barracks, Ohio	1,454.48	4,498.76	1,576.26	5,280.29	16.50	.....
Davids Island, N. Y	.....	.....	1,298.37	1,223.35	.....	.....
Jefferson Barracks, Mo	8,985.00	12,924.40	1,509.71	797.91	3.75	18.55
Willets Point, N. Y	.....	.....	2,127.07	14.40	.....	.....
West Point, N. Y	17,751.72	9,518.63	6.40	556.03	.....	167.30
Hot Springs, Ark	463.00	3,078.24	193.24	1,315.54	10.35	5.25
Fort Leavenworth Military Prison, Kans	.....	.....	3,024.98	1.30	60.02	.....
U. S. Powder Depot, N. J	147.46	.....	.....	.....	.....	.....
Fort Snelling Ordnance Depot, Minn	.....	.....	17.38	6.00	.....	.....
Augusta Arsenal, Ga	252.44	661.07	.....	2.59	.....	.....
Indianapolis Arsenal, Ind	188.70	95.88	.....	53.14	.....	4.55
National Armory, Springfield, Mass	535.39	1,256.30	.....	.....	.....	3.60
Columbia Arsenal, Tenn	268.25	617.58	.....	3.24	.....	.....
Kennebec Arsenal, Me	207.33	1,068.50	20.00	.....	.....	1.92
Watervliet Arsenal, N. Y	532.15	1,591.86	2.60	62.83	.....	.....
Allegheny Arsenal, Pa	484.41	279.52	.....	28.49	4.50	10.25
Frankford Arsenal, Pa	510.36	978.58	.....	.....	.....	.....
Benicia Arsenal, Cal	444.78	1,423.60	.....	2.33	.....	.....
Watertown Arsenal, Mass	694.50	1,792.96	.....	.....	.....	15.60
Rock Island Arsenal, Ill	433.88	1,112.65	.....	20.01	.....	36.15
United States legation at—						
London	.....	82.35	.....	.....	.....	.....
Paris	.....	.....	.....	.....	12.73	.....
Berlin	.....	220.46	.....	.....	1.85	.....
Vienna	.....	316.69	.....	.....	61.08	.....
St. Petersburg	.....	.....	.....	.....	30.00	.....
Rome	.....	301.71	.....	.....	47.75	.....
Total	33,353.85	41,820.74	9,776.01	9,367.45	248.53	263.17
Department of the East.						
Headquarters, Governors Island, N. Y	15,204.28	15,555.81	3,604.39	28.22	111.21	424.10
Baltimore, Md	4,335.98	15,602.27	981.21	44.40	14.26	.....
Buffalo, N. Y	3,626.19	18,699.40	580.57	6.25	32.95	.....
Boston, Mass	9,788.53	19,105.69	498.16	22.02	33.42	.....
Fort Monroe, Va	1,370.76	9,195.23	364.96	10.80	492.61	.....
New Orleans, La	7,587.53	22,415.36	112.60	29.47	21.50	.....
Washington Barracks, D. C	.....	.....	672.23	2,627.17	5.40	.....
Newport Barracks, Ky	.....	.....	189.12	3.25	6.35	.....
Jackson Barracks, La	27.00	.....	.....	10.10	.....	.....
St. Francis Barracks, Fla	.....	.....	.....	11.06	.....	.....
Fort Warren, Mass	.....	.....	.....	9.80	.....	.....
Mount Vernon Barracks, Ala	134.62	.....	9.75	11.50	.....	.....
Fort Preble, Me	45.54	.....	29.25	2.85	3.25	.....
Fort Trumbull, Conn	.....	.....	3.75	4.32	.....	.....
Fort Adams, R. I	798.00	.....	176.47	14.16	4.30	.....
Fort Thomas, Ky	.....	505.00	576.49	1,187.41	19.95	.....
Fort Myer, Va	244.66	59.15	14.65	8.12	.....	.....
Fort Hamilton, N. Y. Harbor	.....	.....	741.96	10.36	.....	.....
Fort Wood, N. Y. Harbor	.....	8.00	70.10	4.71	.....	.....
Fort McHenry, Md	.....	.....	435.50	6.20	.....	.....
Fort Schuyler, N. Y	.....	.....	4.75	2.59	.....	.....
Fort Wadsworth, N. Y	.....	.....	420.00	11.18	.....	.....

made for the Quartermaster's Department for the fiscal year 1893, in the general depots, July 1, 1892, to July 1, 1893, and, so far as accounts have been received in this office, up to

REGULAR SUPPLIES.							INCIDENTAL EXPENSES.	
Printing.	Post school-books and supplies.	Tableware and mess furniture.	Garden utensils and agricultural implements.	Employés.	All expenses not otherwise enumerated.	Total amounts.	Postage.	Advertising.
$257.00	$599.24	$335.50	$1,111.84	$5,086.08	$2,515.79	$63,005.19	$39.00	$24.35
92.03	.....	976.19	27.45	.....	128.88	6,190.67	42.00	.....
.....	.....	.....	1,730.00	.....	2,956.78	83,883.78	11.00	.....
9.70	2.88	96.63	198.56	1,800.00	2,449.75	59,503.65	1.02	.....
.....	43.20	438.80	40.41	.....	2,581.98	15,368.04	16.00	6.31
7.50	198.97	456.28	.....	.....	642.57	7,053.65	24.20	.....
366.23	844.29	2,303.40	3,108.26	6,886.08	11,275.75	235,004.98	133.22	30.65
.....	.....	151.50	40.48	1,320.00	187.82	14,526.09	2.50	.....
.....	.....	.....	2.67	.....	121.51	2,645.90	.32	.....
32.55	.....	308.44	11.00	.....	122.69	24,714.00	.....	.....
.....	.....	.....	.....	.....	9.85	2,151.32	.....	.....
.....	.....	.....	.....	.....	145.00	28,145 08	.....	.....
8.75	.....	.....	.....	.....	133.20	5,207.57	.....	.....
.....	.....	.....	.....	2,100.00	1,197.56	6,383.86	.....	.....
.....	.....	.....	.....	.....	.....	147.46	.....	.....
.....	.....	.....	.....	.....	10.00	33.38	.....	.....
.....	.....	.....	.....	.....	.....	916.10	.....	11.32
1.25	.....	.....	.....	.....	.50	344.02	.....	.....
.....	.....	.....	.....	.....	.....	1,795.29	30.00	3.30
.....	.....	.....	.....	.....	.....	889.07	.....	18.85
1.25	.....	.....	.....	.....	1.00	1,300.00	.....	.....
.....	.....	.....	.....	.....	.....	2,189.44	.80	13.19
.....	.....	.....	.....	.....	.....	807.17	.....	.....
.....	.....	.....	.....	.....	2.10	1,492.04	.....	.....
.....	.....	.....	.....	.....	.....	1,870.71	.....	.....
.....	.....	.....	.....	.....	7.82	2,510.88	.....	.....
.....	.....	.....	.....	.....	.....	1,602.69	9.50	.....
.....	.....	.....	.....	.....	.....	82.35	15.48	.....
.....	.....	.....	.....	.....	.....	12.73	7.18	.....
.....	.....	.....	.....	.....	.....	222.31	.90	.....
.....	.....	.....	.....	.....	.....	377.77	40.00	.....
.....	.....	.....	.....	.....	.....	30.00	30.00	.....
.....	.....	.....	.....	.....	.....	349.46	4.00	.....
43.80	.....	459.94	54.15	3,420.00	1,939.05	100,746.69	140.68	46.66
1,673.20	.....	.....	.....	540.00	54.01	37,195.22	.....	.....
.....	.....	.....	12.70	.....	71.06	21,061.88	2.00	.....
.....	.....	.....	.....	.....	6.34	22,951.70	.....	.....
.....	.....	.....	.....	.....	24.08	29,471.90	5.00	.....
17.80	.....	.....	22.20	900.00	186.55	12,520.91	.....	.....
.....	5.46	.....	.....	900.00	149.14	30,355.60	2.00	.....
.....	.....	.....	2.25	.....	43.76	4,254.02	.....	.....
.....	.....	.....	.....	.....	.....	200.97	.....	.....
.....	.....	.....	.....	.....	128.42	165.52	.....	.....
.....	.....	.....	.....	.....	.....	11.06	.....	.....
.....	.....	.....	.....	.....	.....	9.80	.....	.....
.....	15.00	.....	.....	.....	31.30	202.17	.....	.....
.....	.....	.....	8.32	.....	8.87	98.08	.....	.....
.....	.....	.....	.....	.....	500.00	508.07	.....	.....
.....	.....	.....	3.40	.....	104.25	1,100.58	5.00	.....
.....	192.75	35.50	84.50	954.67	58.26	3,614.53	2.00	.....
.....	.....	39.90	.....	.....	2.75	369.23	.....	.....
.....	44.00	.....	12.50	.....	59.20	868.02	.....	.....
.....	.....	.....	.....	.....	.....	82.81	.....	.....
.....	.....	.....	.....	.....	43.46	485.16	.96	.....
.....	.....	.....	1.25	.....	.....	8.59	1.20	.....
.....	3.47	.....	20.36	.....	230.00	685.01	.....	.....

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	REGULAR SUPPLIES.					
	Forage and straw.	Fuel.	Heating and cooking apparatus, and repairs to same.	Illuminating supplies.	Stationery.	Advertising.
Department of the East—Cont'd.						
Fort Porter, N. Y	$98.08		$412.59	$1,010.36	$0.60	
Fort Ontario, N. Y			263.98	4.75	5.50	
Key West Barracks, Fla				155.85		
Fort Barrancas, Fla				46.97	18.13	
Madison Barracks, N. Y		$58.50	10,282.85	142.60		$61.84
Plattsburg Barracks (and Sackets Harbor), N. Y	496.88			3.54		
Fort Niagara, N. Y	63.54		341.00	51.08		
Fort McPherson (and Atlanta), Ga	1,668.32	1,024.16	245.48	36.47	2.19	
Fort Ethan Allen, Vt					9.50	
Total	45,489.91	102,228.57	21,031.81	5,517.56	781.12	485.94
Department of the Missouri.						
Headquarters, Chicago, Ill	49,202.16	54,685.10	3,367.16	896.53	1,902.97	175.58
Fort Leavenworth, Kans	23,232.20	18,534.73	1,548.59	71.21	171.82	
Fort Riley, Kans	31,365.16	19,800.00	2,655.91	18.96		11.20
Fort Wayne, Mich			794.79	479.95		
Fort Brady, Mich		168.70		10.08		
Fort Mackinac, Mich						
Fort Sheridan, Ill	18,653.07	20,434.43	1,247.36	76.03	9.95	
Fort Reno, Okla	2,988.70	198.92		26.58		
Oklahoma, Okla					.65	
Fort Supply, Ind. T	256.77			20.00		
Fort Sill, Okla	519.70	70.96		9.80		
Sault de Ste. Marie, Mich			117.33			
Total	126,217.76	113,892.84	9,731.14	1,609.14	2,085.39	186.78
Department of the Platte.						
Headquarters, Omaha, Nebr	116,485.68	79,724.00	4,275.71	9,748.79	1,066.44	190.79
Denver, Colo	393.72	6,593.61	6.09		50.07	12.25
Fort McKinney, Wyo	602.19	89.61		28.51		
Fort Robinson, Nebr	70.96	3.70		52.00		
Fort Washakie, Wyo	4,688.79	8,129.84		10.72		
Fort Niobrara, Neb	4.48	7.60	60.00	22.65		
Fort Randall, S. Dak		1.75		1.01		
Fort Omaha, Nebr	19.79	58.06		18.57		
Fort Douglas, Utah		9,760.50		22.13		
Camp Pilot Butte, Wyo		739.00		2.94		
Fort Du Chesne, Utah	1,197.81	73.50		5.26		
Fort D. A. Russell, Wyo	57.62	8,290.83		53.80		
Fort Logan, Colo	45.98	53.25	22.25	19.72		
Fort Sidney, Nebr		2,155.50		9.55		
Bellevue Rifle Range, Nebr						
Total	123,567.02	115,680.75	4,364.05	9,995.65	1,116.51	203.04
Department of Dakota.						
Headquarters, St. Paul, Minn	171,340.20	106,297.41	10,373.56	9,837.50	1,609.00	267.58
Helena, Mont	123.95	475.00				
Fort Custer, Mont	172.06	25.67		12.81		
Fort Meade, S. Dak	259.08	41.25		45.00		
Fort Missoula, Mont				11.80		
Fort Keogh, Mont	921.32	4.00		22.50		
Fort Yellowstone, Wyo			7.00	6.63		
Fort Sully, S. Dak				6.00		
Camp Poplar River, Mont				7.77		
Fort Pembina, N. Dak				7.17		
Fort Buford, N. Dak	46.62			4.50		
Fort Yates, N. Dak				9.00		
Fort Assinniboine, Mont				15.17		
Fort Snelling, Minn			531.88	7.03		
Total	172,863.23	106,843.33	10,912.44	9,992.88	1,609.00	267.58

appropriations made for the Quartermaster's Department, etc.—Continued.

REGULAR SUPPLIES.							INCIDENTAL EXPENSES.	
Printing.	Post school-books and supplies.	Tableware and mess furniture.	Garden utensils and agricultural implements.	Employés.	All expenses not otherwise enumerated.	Total amounts.	Postage.	Advertising.
.....	.....	.....	$29.80	.....	$55.80	$1,607.23	.....	.....
.....	$42.00	.....	.....	.....	44.85	361.08	$0.96	.....
.....	.....	.....	.....	.....	3.00	158.85	.....	.....
.....	.....	.....	.....	.....	.....	65.10	.....	.....
$50.37	5.50	.....	.....	$1,400.00	14.39	12,016.05	8.96	.....
36.75	.....	.....	.....	.....	415.00	952.17	.....	.....
.....	.....	.....	48.30	.....	261.00	764.92	.....	.....
.....	.....	.....	5.60	.....	26.30	3,008.52	.....	.....
.....	.....	.....	.....	.....	.....	9.50	.....	.....
1,778.12	308.18	$75.40	251.18	4,694.87	2,521.79	185,164.25	28.08	.....
1,673.77	419.49	111.91	47.45	.....	919.91	113,402.03	5.00	.....
683.41	367.17	.....	122.23	2,841.00	268.05	47,840.41	6.00	$44.55
.....	.....	.....	27.06	5,191.00	285.96	59,355.25	.....	.....
.....	78.50	.....	16.85	.....	75.36	1,445.45	2.00	.....
.....	.....	.....	.....	513.33	.....	692.11	.....	.....
.....	.....	.....	.....	.....	182.63	182.63	.....	.....
.....	.....	.....	6.00	2,640.00	40.10	43,106.94	2.00	.....
.....	.90	.....	16.45	900.00	.....	4,131.55	22.00	.....
.....	.....	.....	.....	.....	.....	.65	.....	.....
.....	.....	.....	.....	.....	.....	276.77	2.40	.....
.....	.....	.....	.....	825.00	.....	1,425.46	2.00	.....
.....	.....	.....	.....	.....	41.10	158.43	3.00	.....
2,357.18	866.06	111.91	236.04	12,910.33	1,813.11	272,017.68	44.40	44.55
2,108.20	233.41	1,041.75	68.84	6,981.83	4,344.30	226,269.74	.....	.....
.....	.....	.....	.....	.....	16.64	7,072.38	.....	.....
.....	.....	.....	.....	.....	.....	720.31	3.60	.....
.....	.....	.....	.....	895.00	.....	1,021.66	10.80	.....
.....	.....	.....	.....	.....	.....	12,829.35	.....	.....
.....	.....	.....	.....	.....	.....	94.73	12.50	.....
.....	.....	.....	.....	.....	.....	2.76	.....	.....
.....	.....	.....	.....	.....	2.00	98.42	6.00	.....
.....	.....	.....	.....	.....	46.53	9,829.16	2.00	.....
.....	.....	.....	.....	.....	.....	741.94	.....	.....
.....	.....	.....	.....	.....	.....	1,276.57	.....	.....
.....	.....	.....	.....	.....	.....	8,402.25	.....	.....
.....	.....	.....	5.00	.....	.....	146.20	1.00	.....
.....	.....	.....	.....	.....	.....	2,165.05	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
2,108.20	233.41	1,041.75	73.84	7,876.83	4,409.47	270,670.52	35.90	.....
1,889.30	398.77	.....	341.05	2,082.50	1,216.10	305,652.97	.....	.....
.....	.....	.....	.....	.....	.....	598.95	.....	.....
.....	.....	.....	.....	825.00	.....	1,035.54	.....	.....
.....	.....	.....	.....	900.00	.....	1,245.33	.....	.....
.....	.....	.....	.....	.....	15.00	26.80	2.40	.....
.....	.....	.....	.....	600.00	.....	1,547.82	2.00	.....
.....	.....	.....	.....	.....	61.00	74.63	5.00	.....
.....	.....	.....	.....	.....	.....	6.00	.....	.....
.....	.....	.....	.....	.....	.....	7.77	.....	.....
.....	.....	.....	.....	.....	.....	7.17	2.00	.....
.....	.....	.....	.....	.....	.....	51.12	5.00	.....
.....	.....	.....	.....	.....	.....	9.00	9.00	.....
.....	.....	.....	.....	.....	.....	15.17	.10	.....
.....	.....	.....	.....	1,800.00	4.80	2,343.71	1.00	.....
1,889.30	398.77	.....	341.05	6,207.50	1,296.90	312,621.98	26.50	.....

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	REGULAR SUPPLIES.					
	Forage and straw.	Fuel.	Heating and cooking apparatus, and repairs to same.	Illuminating supplies.	Stationery.	Advertising.
Department of Texas.						
Headquarters, San Antonio, Tex.	$67,774.41	$27,838.13	$1,043.99	$1,135.07	$827.10	$124.07
Eagle Pass, camp at, Tex				3.17		
Fort Hancock, Tex				2.60		
Fort Bliss (and El Paso), Tex		1,040.51		10.40		32.70
Fort Sam Houston, Tex	984.77	167.50	30.99	7.49	25.20	
Camp Pena Colorado, Tex				1.94		
Fort Ringgold, Tex				9.10		
Fort McIntosh, Tex				7.30		
Fort Clark, Tex				18.00		
Fort Brown, Tex				.85		
Total	68,759.18	29,046.14	1,074.98	1,195.92	852.30	156.77
Department of California.						
Headquarters, San Francisco, Cal	50,970.68	21,333.99	5.00	131.32	6.15	82.16
Presidio of San Francisco, Cal				17.20		
Fort Mason, Cal				4.67		
Alcatraz Island, Cal			7.00	9.72		
Angel Island, Cal	384.72	220.50		12.16		
Benicia Barracks, Cal				7.00		
Fort Bidwell, Cal	246.32	9.13		3.66		
In the field		55.55				
Total	51,601.72	21,619.17	12.00	185.73	6.15	82.16
Department of Arizona.						
Headquarters, Los Angeles, Cal	190,499.64	57,899.20	83.63	903.49	2,912.07	30.50
Whipple Barracks, Ariz	131.75			9.00		
Fort Huachuca, Ariz	326.98	30.68		20.76		
Fort Wingate, N. Mex	2,255.90	65.45		11.67		
Fort Bayard, N. Mex	384.47	16.38		17.86		
Fort Stanton, N. Mex	41.04	33.76		12.96		
San Carlos, Ariz	64.16	1.74		3.89		
Fort Apache, Ariz	13,247.15	4,950.24		6.00		
Fort Grant, Ariz	937.03	53.83		15.91		
Fort Bowie, Ariz	711.80	9.05		16.20		
San Diego Barracks, Cal				5.40	8.10	
Fort Marcy, N. Mex				6.48		
In the field	1,203.76	27.16				
Total	209,803.68	63,087.49	83.63	1,029.62	2,920.17	30.50
Department of the Columbia.						
Headquarters, Vancouver Barracks, Wash	28,376.12	17,848.00	1,094.08	42.00	2,166.60	286.77
Portland, Oregon	36,557.64	26,857.00	1,601.38	61.95	23.66	
Fort Wallawalla, Wash	10.15			20.40		
Boise Barracks, Idaho	279.96			10.00		
Fort Sherman, Idaho	23.71	70.13		13.90		
Fort Townsend, Wash	21.15			4.03		
Fort Canby, Wash				4.32		
Fort Spokane, Wash	234.09	28.67		14.69		
In the field	627.10	451.96		.65		
Total	66,129.92	45,255.76	2,695.46	171.94	2,190.26	286.77

appropriations made for the Quartermaster's Department, etc.—Continued.

REGULAR SUPPLIES.							INCIDENTAL EXPENSES.	
Printing.	Post school-books and supplies.	Tableware and mess furniture.	Garden utensils and agricultural implements.	Employés.	All expenses not otherwise enumerated.	Total amounts.	Postage.	Advertising.
$1,703.98	$39.96	.....	.....	$4,000.00	$446.56	$104,933.27	$10.00	.....
.....	.....	.....	.....	.....	.....	3.17	1.00	.....
.....	.....	.....	.....	.....	.....	2.60	.80	.....
35.86	.....	.....	.....	.....	.....	1,119.47	2.80	.....
.....	210.00	.....	.....	.....	81.67	1,507.62	2.00	.....
.....	.....	.....	.....	.....	.....	1.94	.....	.....
.....	.....	.....	.....	.....	.....	9.10	1.00	.....
.....	.....	.....	.....	.....	36.00	43.30	1.00	.....
.....	.....	.....	.....	.....	75.00	93.00	.....	.....
.....	.....	.....	.....	.....	.....	.85	.....	.....
1,739.84	249.96	.....	.....	4,000.00	639.23	107,714.32	18.60	.....
3,717.16	.....	.....	.....	.....	1,253.15	77,499.61	.....	.....
.....	.....	.....	.....	1,466.63	61.90	1,545.73	.....	.....
.....	.....	.....	.....	550.00	219.00	773.67	.....	.....
.....	.....	.....	.....	.....	.....	16.72	.....	.....
.....	.....	.....	.....	.....	.....	617.38	1.00	.....
.....	.....	.....	.....	.....	.....	7.00	.....	.....
.....	.....	.....	.....	.....	.....	259.11	.....	.....
.....	.....	.....	.....	.....	.....	55.55	1.20	.....
3,717.16	.....	.....	.....	2,016.63	1,534.05	80,774.77	2.20	.....
4,027.73	275.99	$77.97	$1.00	.....	654.57	257,365.79	16.00	.....
.....	.....	.....	.....	.....	1.84	142.59	9.00	.....
.....	.....	.....	.....	660.00	.....	1,038.42	5.00	.....
.....	.....	.....	.....	660.00	1.00	2,994.02	5.00	.....
.....	.....	.....	.....	660.00	74.83	1,153.54	5.60	.....
.....	.....	.....	.....	.....	.....	87.76	6.00	.....
.....	.....	.....	.....	712.50	.....	782.29	6.00	.....
.....	.....	.....	.....	660.00	20.00	18,883.39	1.00	.....
.....	.....	.....	.....	660.00	.....	1,666.77	4.00	.....
.....	.....	.....	.....	.....	.....	737.05	10.00	.....
.....	.....	.....	.....	.....	282.00	295.50	.....	.....
.....	.....	.....	.....	.....	9.00	15.48	5.00	.....
.....	.....	.....	.....	.....	.....	1,230.92	.....	.....
4,027.73	275.99	77.97	1.00	4,012.50	1,043.24	286,393.52	72.60	.....
1,423.13	206.92	.....	62.56	4,320.00	394.35	56,220.53	10.00	.....
.....	74.53	3.65	23.39	.....	208.35	65,411.55	2.50	.....
.....	.....	.....	.....	.....	276.13	306.68	.....	.....
.....	.....	.....	.....	.....	.....	289.96	1.00	.....
.....	.....	.....	.....	.....	.....	107.74	.....	.....
.....	.....	.....	.....	480.00	9.45	514.63	.....	.....
.....	.....	.....	.....	300.00	.....	304.32	2.60	.....
.....	.....	.....	.....	.....	.....	277.45	4.00	.....
.....	.....	.....	.....	.....	.....	1,079.71	.....	.....
1,423.13	281.45	3.65	85.95	5,100.00	888.28	124,512.57	20.10	.....

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	INCIDENTAL EXPENSES.					
	Extra-duty pay of enlisted men.	Civilian employés.	Shoeing animals, including materials.	Recovery of horses and mules.	Interments of officers and enlisted men.	Telegraph and telephone services.
General depots.						
New York, N. Y	.....	$20,700.81	$1,291.32	.....	$32.85	$627.17
Philadelphia, Pa	.....	21,796.71	207.64	.....	.....	396.75
Washington, D. C	.....	24,909.02	1,075.00	.....	105.00	349.96
Jeffersonville, Ind	.....	17,583.87	149.85	.....	45.00	109.77
San Francisco, Cal	.....	16,034.88	472.39	$25.00	.....	107.90
St. Louis, Mo	.....	13,159.42	264.68	.....	.....	200.00
Total	.....	114,184.71	3,460.88	25.00	182.85	1,791.55
Independent posts, recruiting stations, armories, arsenals, etc.						
Columbus Barracks, Ohio	$1,789.15	3,563.85	.75	.....	.....	72.00
Davids Island, N. Y	2,195.80	1,657.73	.....	.....	.....	63.50
Jefferson Barracks, Mo	2,501.75	3,618.85	.....	.....	.....	28.33
Willets Point, N. Y	1,661.00	.....	.....	.....	15.00	.....
West Point, N. Y	6,978.76	2,616.65	.....	.....	37.85	5.47
Hot Springs, Ark	.....	2,600.04	51.35	.....	25.00	1.00
Fort Leavenworth Military Prison, Kans	127.75	1,800.00	.....	.....	.....	50.00
U. S. Powder Depot, N. J	.....	.....	.....	.....	.....	.....
Fort Snelling Ordnance Depot, Minn	348.55	420.00	.....	.....	.....	.....
Augusta Arsenal, Ga	.....	.....	.....	.....	15.00	.....
Indianapolis Arsenal, Ind	.....	.....	.....	.....	.....	.....
National Armory, Springfield, Mass	.....	300.00	.....	.....	.....	.....
Columbia Arsenal, Tenn	.....	.....	.....	.....	10.00	.....
Kennebec Arsenal, Me	.....	.....	.....	.....	.....	.....
Watervliet Arsenal, N. Y	109.55	.....	.....	.....	.....	.....
Allegheny Arsenal, Pa	.....	.....	.....	.....	.....	.....
Frankford Arsenal, Pa	.....	.....	.....	.....	15.00	.....
Benicia Arsenal, Cal	109.55	.....	22.00	.....	10.00	.....
Watertown Arsenal, Mass	62.65	.....	.....	.....	.....	.....
Rock Island Arsenal, Ill	108.85	.....	.....	.....	.....	.....
United States legation at—						
London	.....	.....	.....	.....	.....	.....
Paris	.....	.....	.....	.....	.....	5.91
Berlin	.....	.....	.....	.....	.....	.....
Vienna	.....	.....	.....	.....	.....	.....
St. Petersburg	.....	.....	.....	.....	.....	.....
Rome	.....	.....	.....	.....	.....	.....
Total	15,993.36	16,577.12	74.10	.....	127.85	226.21
Department of the East.						
Headquarters, Governors Island, N. Y	1,222.85	19,104.95	12.00	.....	75.00	109.50
Baltimore, Md	.....	4,019.96	.....	5.75	75.00	83.50
Buffalo, N. Y	.....	3,720.00	.....	.....	.....	.....
Boston, Mass	.....	4,250.00	13.14	.....	15.00	.....
Fort Monroe, Va	1,382.60	3,245.96	.....	.....	.....	30.00
New Orleans, La	.....	3,540.00	.....	.....	.....	.....
Washington Barracks, D. C	1,202.31	.....	117.25	.....	.....	.....
Newport Barracks, Ky	406.25	.....	88.93	.....	.....	.....
Jackson Barracks, La	598.95	.....	118.40	.....	.....	144.00
St. Francis Barracks, Fla	557.95	.....	.....	.....	.....	.....
Fort Warren, Mass	717.21	.....	.....	.....	.....	.....
Mount Vernon Barracks, Ala	1,150.30	1,245.00	50.00	.....	.....	.....
Fort Preble, Me	480.50	.....	55.00	.....	.....	84.00
Fort Trumbull, Conn	483.00	.....	47.50	.....	15.00	.....
Fort Adams, R. I	1,102.55	.....	117.94	.....	75.00	.....
Fort Thomas, Ky	1,309.90	579.99	172.05	.....	26.90	250.00
Fort Myer, Va	1,099.60	.....	.....	.....	25.00	139.17
Fort Hamilton, N. Y. Harbor	960.00	.....	19.50	.....	.....	.....
Fort Wood, N. Y. Harbor	477.25	.....	.....	.....	.....	.....
Fort McHenry, Md	766.58	.....	79.10	.....	.....	.....
Fort Schuyler, N. Y	622.90	.....	136.49	.....	15.00	1.50
Fort Wadsworth, N. Y	890.95	.....	153.75	.....	.....	.....
Fort Porter, N. Y	694.00	.....	54.00	.....	10.00	.....
Fort Ontario, N. Y	479.15	.....	33.00	.....	.....	.....
Key West Barracks, Fla	155.50	.....	3.00	.....	.....	10.16

appropriations made for the Quartermaster's Department, etc.—Continued.

INCIDENTAL EXPENSES.					CAVALRY AND ARTILLERY HORSES.			
Subscription to newspapers and publications.	Office furniture.	Apprehension and delivery of deserters.	All expenses not otherwise enumerated.	Total amounts.	Purchase of cavalry and artillery horses.	Advertising.	All expenses not otherwise enumerated.	Total amounts.
$3,806.31	$574.64	$1,380.00	$2,731.91	$31,208.36	$537.50	.....	.....	$537.50
.....	5.16	540.00	316.80	23,305.06	.....	.....	.....	.....
4.75	890.25	60.00	1,780.64	29,185.62	.....	.....	.....	.....
.....	14.00	60.00	118.38	18,081.89	.....	.....	.....	.....
.....	433.76	.....	606.78	17,703.01	.....	.....	.....	.....
6.00	70.50	1,140.00	763.38	15,628.18	10,318.00	$82.99	$1,839.95	12,240.94
3,817.06	1,988.31	3,180.00	6,317.89	135,112.12	10,855.50	82.99	1,839.95	12,778.44
5.00	102.75	780.00	87.70	6,403.70	.....	.....	.....	.....
.....	41.95	.....	204.96	4,164.26	.....	.....	.....	.....
.....	50.00	.....	612.25	6,811.18	.....	.....	.....	.....
.....	.....	.....	.....	1,676.00	.....	.....	.....	.....
.....	.....	60.00	11.75	9,710.48	.....	.....	.....	.....
.....	.....	.....	1.10	2,678.49	.....	.....	.....	.....
.....	.....	.....	7.50	1,985.25	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	6.00	778.55	.....	.....	.....	.....
.....	.....	.....	2.50	28.82	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	333.30	.....	.....	.....	.....
.....	.....	.....	.....	28.85	.....	.....	.....	.....
.....	.....	.....	15.00	15.00	.....	.....	.....	.....
.....	.....	120.00	38.00	281.54	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	15.00	.....	.....	.....	.....
.....	.....	.....	11.00	152.55	.....	.....	.....	.....
.....	.....	.....	.50	63.15	.....	.....	.....	.....
.....	.....	.....	12.50	130.85	.....	.....	.....	.....
.....	.....	.....	127.75	143.23	.....	.....	.....	.....
.....	.....	.....	28.95	42.04	.....	.....	.....	.....
.....	.....	.....	28.50	29.40	.....	.....	.....	.....
.....	.....	.....	.....	40.00	.....	.....	.....	.....
.....	.....	.....	.....	30.00	.....	.....	.....	.....
.....	.....	.....	.....	4.00	.....	.....	.....	.....
5.00	194.70	960.00	1,195.96	35,541.64	.....	.....	.....	.....
.....	256.00	1,770.00	66.00	22,616.30	.....	.....	.....	.....
5.00	182.65	240.00	23.50	4,637.36	.....	.....	.....	.....
5.00	2.20	60.00	1.48	3,788.68	.....	.....	.....	.....
5.50	8.96	380.00	24.15	4,701.75	600.00	.....	10.00	610.00
.....	60.00	120.00	.....	4,838.56	.....	.....	.....	.....
6.00	1.90	.....	26.05	3,575.95	.....	.....	.....	.....
.....	42.00	.....	.....	1,361.56	.....	.....	.....	.....
.....	.....	60.00	1.60	556.78	.....	.....	.....	.....
.....	6.00	120.60	11.60	998.95	.....	.....	.....	.....
.....	.....	.....	7.60	565.55	.....	.....	.....	.....
.....	.....	.....	.....	717.21	.....	.....	.....	.....
.....	.....	180.00	22.50	2,647.80	.....	.....	.....	.....
.....	1.00	.....	.....	620.50	.....	.....	.....	.....
.....	.....	300.00	33.00	878.50	.....	.....	.....	.....
.....	1.00	180.00	33.36	1,514.85	.....	.....	.....	.....
.....	.....	.....	4.30	2,345.14	.....	.....	.....	.....
.....	1.25	300.00	12.72	1,577.74	.....	.....	.....	.....
.....	.....	.....	70.00	1,049.50	.....	.....	.....	.....
.....	.....	.....	.....	477.25	.....	.....	.....	.....
.....	.....	240.00	.....	1,086.64	.....	.....	.....	.....
.....	.....	.....	.....	777.09	.....	.....	.....	.....
.....	.....	.....	76.63	1,121.33	.....	.....	.....	.....
.....	.....	480.00	.70	1,238.70	.....	.....	.....	.....
.....	.....	120.00	.....	633.11	.....	.....	.....	.....
.....	.....	.....	1,157.82	1,326.48	.....	.....	.....	.....

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	INCIDENTAL EXPENSES.					
	Extra-duty pay of enlisted men.	Civilian employés.	Shoeing animals, including materials.	Recovery of horses and mules.	Interments of officers and enlisted men.	Telegraph and telephone services.
Department of the East—Cont'd.						
Fort Barrancas, Fla	$655.00	$2,189.68			$10.00	
Madison Barracks, N. Y.	1,458.85	2,079.96				
Plattsburg Barracks (and Sackets Harbor), N. Y.	433.45	2,400.00	$44.13			
Fort Niagara, N. Y.	765.05		110.00			$29.15
Fort McPherson (and Atlanta), Ga	1,116.90	5,341.16	10.00		110.00	128.85
Fort Ethan Allen, Vt.		311.10	1.25			
Total	21,189.55	52,027.76	1,436.43	$5.75	451.90	1,009.83
Department of the Missouri.						
Headquarters, Chicago, Ill		27,798.03	739.19		109.00	722.16
Fort Leavenworth, Kans.	2,387.69	6,916.63				191.98
Fort Riley, Kans	1,813.48	3,995.00				275.00
Fort Wayne, Mich	1,019.25		170.57			
Fort Brady, Mich	719.20		78.30			
Fort Mackinac, Mich.	525.00					
Fort Sheridan, Ill	2,040.50	5,534.00	207.00			37.50
Fort Reno, Okla.	1,509.30	1,200.00	109.01		10.90	
Oklahoma, Okla	51.10					
Fort Supply, Ind. T.	1,156.71	1,200.00		15.00		
Fort Sill, Okla.	1,293.26	1,100.00				
Sault de Ste. Marie, Mich.		2,280.00				
Total	12,515.49	50,023.66	1,304.07	15.00	119.00	1,226.64
Department of the Platte.						
Headquarters, Omaha, Nebr		29,263.27	141.00	25.00		428.22
Denver, Colo		2,475.00	31.15			89.00
Fort McKinney, Wyo.	1,553.35	1,920.00		25.00	19.55	
Fort Robinson, Nebr	2,061.87	1,183.33		30.00		
Fort Washakie, Wyo	662.40	600.00	26.10		11.00	
Fort Niobrara, Nebr	1,990.80				60.00	
Fort Randall, S. Dak	217.40					
Fort Omaha, Nebr.	2,281.90		448.67		25.00	144.00
Fort Douglas, Utah	2,334.10				75.00	168.00
Camp Pilot Butte, Wyo	487.60		64.20			
Fort Du Chesne, Utah.	742.55	900.00	1.50			
Fort D. A. Russell, Wyo.	1,963.65					144.00
Fort Logan, Colo.	1,510.25				75.00	
Fort Sidney, Nebr.	705.10					
Bellevue Rifle Range, Nebr	36.05					
Total	16,517.02	36,341.60	712.62	80.00	265.55	973.22
Department of Dakota.						
Headquarters, St. Paul, Minn.	10.75	18,483.22	119.42			396.50
Helena, Mont		2,400.00	8.00			
Fort Custer, Mont.	2,297.75	2,126.63	3.50			
Fort Meade, S. Dak	2,103.32			30.00		225.00
Fort Missoula, Mont	1,301.45					72.00
Fort Keogh, Mont.	1,896.03	825.00	99.41			
Fort Yellowstone, Wyo	559.35	960.00				
Fort Sully, S. Dak.	1,242.65					
Camp Poplar River, Mont	676.75					
Fort Pembina, N. Dak.	539.50		17.50			
Fort Buford, N. Dak.	1,595.80	825.00				
Fort Yates, N. Dak.	2,289.15	720.00	4.00	25.00		
Fort Assiniboine, Mont.	1,579.50	660.00				
Fort Snelling, Minn.	2,173.00	1,200.00				180.00
Total	18,265.00	28,199.85	251.83	55.00		873.50
Department of Texas.						
Headquarters, San Antonio, Tex.	622.05	18,207.51	22.80	20.00	55.00	409.15
Eagle Pass, camp at, Tex.	445.65		108.00			
Fort Hancock, Tex.	460.85			25.00		
Fort Bliss (and El Paso), Tex.	618.55	1,599.96	17.45			72.00

appropriations made for the Quartermaster's Department, etc.—Continued.

INCIDENTAL EXPENSES.					CAVALRY AND ARTILLERY HORSES.			
Subscription to newspapers and publications.	Office furniture.	Apprehension and delivery of deserters.	All expenses not otherwise enumerated.	Total amounts.	Purchase of cavalry and artillery horses.	Advertising.	All expenses not otherwise enumerated.	Total amounts.
.....	.....	$180.00	$297.60	$3,332.28	.....	.....	.....	.....
.....	$9.15	60.00	1,547.20	5,164.12	.....	.....	.....	.....
$2.50	150.00	.....	3,666.64	6,696.72	.....	.....	.....	.....
.....	.....	.....	.....	904.20	.....	.....	.....	.....
5.00	17.00	240.00	575.26	7,544.17	.....	.....	.....	.....
.....	.....	.....	304.17	616.52	.....	.....	.....	.....
29.00	739.11	5,030.00	7,963.88	89,911.29	$600.00	.....	$10.00	$610.00
.....	835.37	1,380.00	2,995.79	34,584.54	.....	$13.25	.....	13.25
.....	336.83	1,200.00	470.78	11,554.46	.....	.....	.....	.....
.....	.....	420.00	171.50	6,674.98	1,453.00	.....	.....	1,453.00
.....	.....	240.00	92.85	1,524.67	.....	.....	.....	.....
.....	1.50	60.00	23.40	882.40	.....	.....	.....	.....
.....	.....	.....	5.75	530.75	.....	.....	.....	.....
.....	917.50	240.00	1,699.60	10,678.10	.....	.....	.....	.....
.....	.....	180.00	89.33	3,119.64	.....	.....	.....	.....
.....	.....	.....	.....	51.10	.....	.....	.....	.....
.....	.....	180.00	172.25	2,726.36	.....	.....	.....	.....
.....	.....	60.00	10.00	2,465.26	.....	.....	.....	.....
.....	.....	.....	1,038.00	3,321.00	.....	.....	.....	.....
.....	2,091.20	3,960.00	6,769.25	78,113.26	1,453.00	13.25	.....	1,466.25
16.00	76.24	60.00	1,680.74	31,690.47	11,374.20	109.16	.....	11,483.36
.....	2.25	120.00	2.00	2,719.40	.....	.....	.....	.....
.....	.....	98.00	31.50	3,651.00	.....	.....	.....	.....
.....	.....	180.00	73.00	3,539.00	.....	.....	.....	.....
.....	.....	.....	26.25	1,295.75	.....	.....	.....	.....
.....	1.50	300.00	38.90	2,403.70	.....	.....	.....	.....
.....	.....	.....	3.25	220.65	.....	.....	.....	.....
.....	.....	660.00	.....	3,565.57	.....	.....	.....	.....
.....	.....	480.00	7.80	3,066.90	.....	.....	.....	.....
.....	1.50	60.00	.....	613.30	.....	.....	.....	.....
.....	.....	.....	9.00	1,653.05	.....	.....	.....	.....
.....	11.50	180.00	149.50	2,448.65	.....	.....	.....	.....
.....	1.00	660.00	17.50	2,264.75	.....	.....	.....	.....
.....	.....	60.00	.....	765.10	.....	.....	.....	.....
.....	.....	.....	.....	36.05	.....	.....	.....	.....
16.00	93.99	2,858.00	2,039.44	59,933.34	11,374.20	109.16	.....	11,483.36
10.00	1,482.86	.....	441.15	20,943.90	.....	.....	120.00	120.00
4.00	.....	.....	130.00	2,542.00	.....	.....	.....	.....
.....	.....	.....	28.50	4,456.38	.....	.....	.....	.....
.....	.....	120.00	82.75	2,561.07	.....	.....	.....	.....
.....	4.50	120.00	.....	1,500.35	.....	.....	.....	.....
.....	4.00	960.00	29.00	3,815.44	.....	.....	.....	.....
.....	.....	.....	22.00	1,546.35	.....	.....	.....	.....
.....	.....	420.00	16.75	1,679.40	.....	.....	.....	.....
.....	.....	.....	.....	676.75	.....	.....	.....	.....
.....	3.00	120.00	32.75	714.75	.....	.....	.....	.....
.....	.....	60.00	4.50	2,490.30	.....	.....	.....	.....
.....	.....	60.00	20.82	3,127.97	.....	.....	.....	.....
.....	.....	120.00	5.00	2,364.60	.....	.....	.....	.....
.....	.....	961.95	35.25	4,551.20	.....	.....	.....	.....
14.00	1,494.36	2,941.95	848.47	52,970.46	.....	.....	120.00	120.00
.....	396.90	2,220.00	4,288.11	26,242.52	3,273.20	83.81	133.92	3,490.93
.....	.....	.....	4.50	559.15	.....	.....	.....	.....
.....	.....	60.00	.....	546.65	.....	.....	.....	.....
.....	.....	.....	347.50	2,658.26	.....	.....	.....	.....

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	INCIDENTAL EXPENSES.					
	Extra-duty pay of enlisted men.	Civilian employés.	Shoeing animals, including materials.	Recovery of horses and mules.	Interments of officers and enlisted men.	Telegraph and telephone services.
Department of Texas—Cont'd.						
Fort Sam Houston, Tex	$1,057.40		$11.35			$24.00
Camp Pena Colorado, Tex	222.65					
Fort Ringgold, Tex	1,048.20					
Fort McIntosh, Tex	951.05		4.00			55.00
Fort Clark, Tex	1,320.10					120.00
Fort Brown, Tex	399.35					
Total	7,145.85	$19,807.47	163.60	$45.00	$55.60	671.15
Department of California.						
Headquarters, San Francisco, Cal		12,709.99			36.00	322.35
Presidio of San Francisco, Cal	2,338.90	1,466.63				
Fort Mason, Cal	915.93		172.80			
Alcatraz Island, Cal	946.75		200.00			
Angel Island, Cal	1,480.65		1.90			
Benicia Barracks, Cal	743.00		192.85		40.00	55.50
Fort Bidwell, Cal	489.35		96.00			
In the field						
Total	6,914.58	14,176.62	663.55		76.00	377.85
Department of Arizona.						
Headquarters, Los Angeles, Cal		17,761.93	264.40			292.70
Whipple Barracks, Ariz	1,093.60					
Fort Huachuca, Ariz	1,525.45		2.50			
Fort Wingate, N. Mex	1,902.85	825.00	39.75			100.00
Fort Bayard, N. Mex	1,684.70					
Fort Stanton, N. Mex	611.72					
San Carlos, Ariz	1,277.65	825.00	11.00			
Fort Apache, Ariz	2,104.25	825.00	5.00			
Fort Grant, Ariz	1,196.80		14.75			
Fort Bowie, Ariz	839.65					
San Diego Barracks, Cal	476.15		164.50			44.00
Fort Marcy, N. Mex	1,053.38		189.90			
In the field			12.50	10.00	9.49	
Total	13,766.20	20,236.93	704.30	10.00	9.49	436.70
Department of the Columbia.						
Headquarters, Vancouver Barracks, Wash	2,725.27	9,303.33	141.07			600.10
Portland, Oregon	145.83	3,290.03				90.00
Fort Wallawalla, Wash	905.10					125.84
Boise Barracks, Idaho	656.65					55.00
Fort Sherman, Idaho	1,003.80					
Fort Townsend, Wash	639.65		158.49			79.80
Fort Canby, Wash	1,104.25					
Fort Spokane, Wash	887.10		9.00			
In the field	35.35		25.60		75.00	
Total	8,103.00	12,593.36	334.16		75.00	950.74

appropriations made for the Quartermaster's Department, etc.—Continued.

INCIDENTAL EXPENSES.					CAVALRY AND ARTILLERY HORSES.			
Subscription to newspapers and publications.	Office furniture.	Apprehension and delivery of deserters.	All expenses not otherwise enumerated.	Total amounts.	Purchase of cavalry and artillery horses.	Advertising.	All expenses not otherwise enumerated.	Total amounts.
.....	.....	.....	$39.00	$1,133.75	.....	.....	.....	.....
.....	.....	.....	.....	222.65	.....	.....	.....	.....
.....	.....	.....	73.75	1,122.95	.....	.....	.....	.....
.....	$3.25	.....	1,098.16	2,112.46	.....	.....	.....	.....
.....	.....	.....	.....	1,440.10	.....	.....	.....	.....
.....	.....	.....	138.25	537.60	.....	.....	.....	.....
.....	400.15	$2,280.00	5,989.27	36,576.09	$3,273.20	$83.81	$133.92	$3,490.93
.....	188.80	1,080.00	234.58	14,571.72	696.60	39.11	.....	735.71
.....	.....	.....	130.00	3,935.53	.....	.....	.....	.....
.....	.....	.....	5.00	1,093.73	.....	.....	.....	.....
.....	6.00	.....	5.00	1,157.75	.....	.....	.....	.....
.....	.....	.....	.....	1,483.55	.....	.....	.....	.....
.....	.....	.....	.....	1,031.35	.....	.....	.....	.....
.....	.....	.....	6.50	593.05	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	194.80	1,080.00	381.08	23,866.68	696.60	39.11	.....	735.71
.....	341.55	1,080.00	867.41	20,623.99	.....	.....	.....	.....
.....	.....	60.00	.....	1,162.60	.....	.....	.....	.....
.....	.....	.....	8.25	1,541.20	.....	.....	.....	.....
.....	.....	.....	72.50	2,945.10	.....	.....	.....	.....
.....	.....	120.00	37.00	1,847.30	.....	.....	.....	.....
.....	10.00	.....	.....	627.72	.....	.....	.....	.....
.....	5.00	.....	7.50	2,132.15	.....	.....	.....	.....
.....	.....	.....	.....	2,935.25	.....	.....	.....	.....
.....	.....	60.00	17.50	1,293.05	.....	.....	.....	.....
.....	.....	.....	.....	849.65	.....	.....	.....	.....
.....	.....	.....	59.50	744.15	.....	.....	.....	.....
.....	.....	.....	3.50	1,251.78	.....	.....	.....	.....
.....	.....	.....	78.00	109.99	.....	.....	.....	.....
.....	356.55	1,320.00	1,151.16	38,063.93	.....	.....	.....	.....
.....	129.23	360.00	687.05	13,956.05	2,354.10	.....	2.00	2,356.10
.....	99.60	420.00	72.77	4,120.73	.....	.....	.....	.....
.....	.....	.....	21.00	1,051.94	.....	.....	.....	.....
.....	.....	.....	.....	712.65	.....	.....	.....	.....
.....	.....	.....	11.55	1,015.35	.....	.....	.....	.....
.....	.....	.....	18.00	895.94	.....	.....	.....	.....
.....	.....	.....	.....	1,106.85	.....	.....	.....	.....
.....	.....	.....	.....	900.10	.....	.....	.....	.....
.....	.....	.....	8.00	143.95	.....	.....	.....	.....
.....	228.83	780.00	818.37	23,903.56	2,354.10	.....	2.00	2,356.10

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	TRANSPORTATION OF THE ARMY.					
	Railroad transportation.	Water transportation.	Expressage.	Wagon transportation.	Stage transportation.	Civilian employés, pay of.
General depots.						
New York, N. Y	$34,252.52	$12,298.67	$255.37	$3,157.48	.....	$13,662.90
Philadelphia, Pa	1,720.97	2.43	106.35	976.25	.....	32,076.45
Washington, D. C	19,190.62	3,506.88	411.37	1,472.75	$8.50	15,691.67
Jeffersonville, Ind	23,382.68	31.33	9.60	753.87	.....	24,069.51
San Francisco, Cal	4,800.39	467.63	1,295.23	7,270.40	355.25	7,119.96
St. Louis, Mo	39,958.28	87.92	273.34	3,227.64	4.00	11,585.29
Total	123,305.46	16,394.86	2,351.26	16,858.39	367.75	104,205.78
Independent posts, recruiting stations, armories, arsenals, etc.						
Columbus Barracks, Ohio	15,862.75	.....	.....	1.50	.....	.....
Davids Island, N. Y	.....	87.77	1.25	3.79	.....	960.00
Jefferson Barracks, Mo	8.00	.....	.....	.....	.....	3,399.96
Willets Point, N. Y	.....	.....	.....	.....	.....	.....
West Point, N. Y	.....	.....	8.50	.....	.....	.....
Hot Springs, Ark	.....	.....	.....	.....	.....	480.00
Fort Leavenworth Military Prison, Kans	.....	.....	.....	.....	.....	1,200.00
U. S. Powder Depot, N. J	.....	.....	.....	.....	.....	.....
Fort Snelling Ordnance Depot, Minn	.....	.....	.....	.....	.....	420.00
Augusta Arsenal, Ga	.....	.....	.....	28.67	.....	.....
Indianapolis Arsenal, Ind	.....	.....	.....	.....	.....	.....
National Armory, Springfield, Mass	.....	.....	.....	352.35	.....	.....
Columbia Arsenal, Tenn	.....	.....	.....	53.15	.....	.....
Kennebec Arsenal, Me	.....	.....	.....	31.25	.....	.....
Watervliet Arsenal, N. Y	.....	.....	.....	402.57	.....	.....
Allegheny Arsenal, Pa	.....	.....	.....	69.85	.....	.....
Frankford Arsenal, Pa	.....	.....	.....	560.73	.....	994.40
Benicia Arsenal, Cal	.....	.....	.....	460.28	.....	.....
Watertown Arsenal, Mass	.....	.....	.....	410.41	.....	.....
Rock Island Arsenal, Ill	.....	.....	.....	2,106.75	.....	.....
United States legation at—						
London	.....	.....	.....	.....	.....	.....
Paris	.....	.....	.....	.....	.....	.....
Berlin	.....	.....	.....	.....	.....	.....
Vienna	.....	.....	.....	.....	.....	.....
St. Petersburg	.....	.....	.....	.....	.....	.....
Rome	.....	.....	.....	.....	.....	.....
Total	15,870.75	87.77	9.75	4,481.30	.....	7,454.36
Department of the East.						
Headquarters Governors Island, N. Y	.....	.....	.....	.....	.....	5,900.04
Baltimore, Md	18,027.87	2,114.16	2.65	836.92	.....	.....
Buffalo, N. Y	1,143.62	742.29	1.80	406.33	42.00	.....
Boston, Mass	4,119.78	3,208.25	1.10	1,300.16	.....	.....
Fort Monroe, Va	.....	.....	.....	661.24	.....	5,506.76
New Orleans, La	5,577.89	1,415.15	31.42	960.50	.....	.....
Washington Barracks, D. C	.....	.....	.....	.....	.....	360.00
Newport Barracks, Ky	.....	.....	.....	.....	.....	.....
Jackson Barracks, La	.....	.....	.....	.....	.....	1,080.00
St. Francis Barracks, Fla	.....	.....	.....	159.50	.....	.....
Fort Warren, Mass	.....	.....	.....	.....	.....	.....
Mount Vernon Barracks, Ala	.....	.....	.....	.....	.....	891.00
Fort Preble, Me	.....	.....	.....	250.00	.....	840.00
Fort Trumbull, Conn	.....	.....	.....	.....	.....	.....
Fort Adams, R. I	.....	.....	.....	505.15	.....	.....
Fort Thomas, Ky	.....	.....	.....	357.87	.....	2,280.00
Fort Myer, Va	.....	.....	.....	.....	.....	942.00
Fort Hamilton, N. Y. Harbor	.....	.....	.....	.....	.....	900.00
Fort Wood, N. Y. Harbor	.....	.....	.....	.....	.....	.....
Fort McHenry, Md	.....	.....	.....	.....	.....	.....
Fort Schuyler, N. Y	.....	.....	.....	.....	.....	718.00
Fort Wadsworth, N. Y	.....	.....	.....	.....	.....	.....

appropriations made for the Quartermaster's Department, etc.—Continued.

TRANSPORTATION OF THE ARMY.								
Extra-duty pay of enlisted men.	Vessels—purchasing, chartering, operating, and maintaining.	Means of transportation—purchasing and repairing wagons, carts, etc.	Animals—purchase, stabling, etc., of.	Harness—purchase and repair of.	Water supply and sewerage.	Wharves and bridges.	Roads, harbors, and rivers.	Tolls on ferries, bridges etc.
....	$49,992.18	$1,334.16	$1,225.00	$1,558.28	$8,315.05	$11,251.59	$183.00	$10.85
....	....	348.30	185.00	358.50	388.57	....	....	....
....	....	1,740.75	495.00	939.03	22,298.95	....	5,204.88	....
....	....	2,619.57	....	2,477.81	1,946.99	....	....	137.50
....	1,148.09	4,209.97	475.00	693.54	4,219.13	....	115.50	73.00
....	....	859.91	39,357.80	759.23	6,097.25	....	155.60	15.00
....	51,140.27	11,112.66	41,737.80	6,786.39	43,265.94	11,251.59	5,658.98	236.35
$1,127.85	....	109.51	425.00	61.75	5,109.88	....	142.65	....
997.10	3,431.09	27.15	....	....	5,367.02	2,000.00	80.00	....
2,057.40	....	....	....	4.45	7,605.13	....	141.35	....
1,501.30	....	....	....	....	195.32	1,799.70	941.94	....
3,651.55	....	....	660.00	....	....	....	....	....
....	....	13.75	....	10.00	753.22	....	....	....
....	....	431.33	....	3,386.50	185.92	....	....	....
....	....	....	....	....	....	....	....	....
....	....	14.50	....	....	259.52	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	7.82	....	....	....	....	....	....
....	....	34.13	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....	....
9,335.20	3,431.09	638.19	1,085.00	3,462.70	19,476.01	3,799.70	1,305.94	....
152.00	13,517.91	3.50	....	....	4,709.84	5,194.19	15.00	....
....	40.00	69.62	....	8.70	925.39	....	....	....
....	....	3.75	675.00	9.60	1,701.85	....	....	....
....	11,366.09	53.24	160.00	3.60	706.61	725.00	....	....
837.85	521.54	33.00	190.00	6.75	4,547.39	295.00	....	....
....	1,023.21	183.75	....	24.23	739.59	....	....	10.00
679.35	....	128.75	....	....	622.81	....	....	....
255.50	....	6.95	....	5.50	315.36	....	....	41.00
382.55	....	153.75	....	16.00	417.29	....	854.34	....
400.65	....	....	....	....	107.81	....	....	....
381.50	....	12.00	....	....	1,759.89	....	....	....
478.25	....	7.50	....	12.50	3,893.12	....	....	....
404.00	20.79	120.30	....	5.95	775.47	....	....	....
358.60	....	76.00	....	....	378.60	....	220.00	26.81
747.10	2,735.74	66.00	....	3.00	3,850.40	314.80	821.95	....
646.30	....	191.66	....	7.52	4,007.25	....	178.49	161.22
676.95	....	59.75	....	....	260.35	....	17.38	37.84
529.25	....	....	....	....	3,208.20	368.00	722.00	....
127.75	....	....	....	....	682.46	....	....	....
491.58	....	84.46	....	....	615.68	....	....	....
492.85	....	175.75	....	....	1,040.75	....	....	....
535.70	....	191.45	....	....	1,979.27	209.00	....	8.40

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	TRANSPORTATION OF THE ARMY.					
	Railroad transportation.	Water transportation.	Express-age.	Wagon transportation.	Stage transportation.	Civilian employés, pay of.
Department of the East—Cont'd.						
Fort Porter, N. Y.						
Fort Ontario, N. Y						
Key West Barracks, Fla.				$35.82		
Fort Barrancas, Fla.		$27.24		64.43		$172.50
Madison Barracks, N. Y.						1,800.00
Plattsburg Barracks (and Sackets Harbor), N. Y				1.30		
Fort Niagara, N. Y.						1,320.00
Fort McPherson (and Atlanta), Ga				24.50		2,740.00
Fort Ethan Allen, Vt.				11.65		166.67
Total	$28,869.16	7,507.09	$36.97	5,575.37	$42.00	25,676.97
Department of the Missouri.						
Headquarters, Chicago, Ill	59,549.61	317.38	132.60	10,011.20	6.18	9,880.36
Fort Leavenworth, Kans.	866.83		95.31	1,291.60	166.00	8,774.42
Fort Riley, Kans						10,516.93
Fort Wayne, Mich				20.00		900.00
Fort Brady, Mich				135.72		
Fort Mackinac, Mich.						720.00
Fort Sheridan, Ill				268.00		5,033.30
Fort Reno, Okla				730.02		7,000.00
Oklahoma, Okla						
Fort Supply, Ind. T						4,625.00
Fort Sill, Okla.				1.80	301.95	5,290.00
Sault de Ste. Marie, Mich.				20.25		800.00
Total	60,416.44	317.38	227.91	12,478.59	474.13	53,540.01
Department of the Platte.						
Headquarters, Omaha, Nebr	43,991.52	194.53	603.23	11,791.56	2,348.61	23,822.46
Denver, Colo	74,642.86		343.22	2.00		5,593.30
Fort McKinney, Wyo						3,824.00
Fort Robinson, Nebr					21.00	5,168.28
Fort Washakie, Wyo.						2,068.00
Fort Niobrara, Nebr.			1.25	1,829.75		6,714.62
Fort Randall, S. Dak						1,054.00
Fort Omaha, Nebr.				40.00		1,379.99
Fort Douglas, Utah				643.41		1,770.00
Camp Pilot Butte, Wyo						
Fort Du Chesne, Utah						2,505.00
Fort D. A. Russell, Wyo.						12,631.63
Fort Logan, Colo						3,647.00
Fort Sidney, Nebr.				45.11		2,430.00
Bellevue Rifle Range, Nebr						
Total	118,634.38	194.53	947.70	14,351.83	2,369.61	72,608.28
Department of Dakota.						
Headquarters, St. Paul, Minn.	71,622.45	813.47	646.94	11,377.45	812.52	15,224.88
Helena, Mont.	92.50		51.21	2,764.32	51.00	155.00
Fort Custer, Mont.						10,201.21
Fort Meade, S. Dak						6,958.00
Fort Missoula, Mont.						5,450.50
Fort Keogh, Mont.						6,247.11
Fort Yellowstone, Wyo						3,433.98
Fort Sully, S. Dak						3,159.96
Camp Poplar River, Mont.						1,727.17
Fort Pembina, N. Dak.						1,974.96
Fort Buford, N. Dak.						4,931.83
Fort Yates, N. Dak.						6,159.96
Fort Assiniboine, Mont.						6,237.33
Fort Snelling, Minn				255.00		6,979.92
Total	71,714.95	813.47	698.15	14,396.77	863.52	78,841.81

appropriations made for the Quartermaster's Department, etc.—Continued.

TRANSPORTATION OF THE ARMY.

Extra-duty pay of enlisted men.	Vessels—purchasing, chartering, operating, and maintaining.	Means of transportation—purchasing and repairing wagons, carts, etc.	Animals—purchase, stabling, etc., of.	Harness—purchase and repair of.	Water supply and sewerage.	Wharves and bridges.	Roads, harbors, and rivers.	Tolls on ferries, bridges, etc.
$386.65	.....	$25.25	.....	.....	$464.47	.....	.....	$20.00
127.75	.....	29.15	.....	.....	583.76	.....	$22.40	.....
100.40	.....	1.50	.....	.....	1,866.00	.....	3,008.80	.....
379.45	$2,515.00	.....	.....	.....	19,813.66	$480.60	.....	.....
651.90	.....	106.00	$150.00	$25.00	9,207.87	.....	1,709.73	.....
396.85	.....	101.40	150.00	9.98	10,851.67	.....	8,304.12	.....
463.15	.....	6.75	.....	.....	1,847.38	.....	245.93	.....
788.80	.....	10.93	113.33	.....	5,005.44	.....	1,344.82	.....
.....	.....	11.55	.....	.....	.....	.....	438.02	.....
11,862.68	31,740.28	1,933.71	1,438.33	138.33	86,875.63	7,586.59	17,902.98	305.27
.....	.....	815.29	150.00	117.02	3,789.28	.....	449.94	.....
1,330.00	.....	400.95	528.00	164.00	8,728.86	.....	69.25	7.00
803.12	.....	314.25	.....	.....	1,040.64	587.50	6,008.50	.....
548.65	.....	169.25	350.00	15.15	1,104.43	.....	273.85	.....
468.50	.....	4.75	.....	.....	1,595.26	.....	.....	.....
303.85	.....	.....	.....	.....	.....	.....	.....	.....
918.05	.....	126.35	.....	101.04	7,892.29	.....	6,159.21	.....
2,334.20	.....	59.65	.....	.....	2,147.71	.....	.....	5.50
21.70	.....	10.00	.....	.....	.....	.....	.....	.....
1,452.86	.....	.....	.....	.....	.....	.....	.....	.....
2,012.81	.....	.....	.....	.....	.....	.....	.....	60.00
.....	.....	21.45	.....	.....	2 358.68	.....	113.27	.....
10,193.74	.....	1,921.94	1,028.00	397.21	28,657.15	587.50	13.074.02	72.50
.....	.....	3,227.42	375.00	777.36	9,318.63	.....	.....	.....
.....	.....	13.25	.....	.....	190.64	.....	85.00	.....
1,897.00	.....	.....	94.50	.....	170.00	.....	.....	.....
3,095.94	.....	.....	.....	.....	1,468.50	.....	.....	.....
938.65	.....	1.00	.....	.....	.....	.....	99.96	.....
2,333.85	.....	.....	.....	.....	194.22	.....	.....	.....
213.55	.....	.....	154.80	.....	.....	.....	.....	1.50
1,826.90	.....	520.52	.....	.....	3,885.00	.....	.....	.....
1,277.50	.....	.....	.....	.....	1,414.65	190.00	.....	.....
355.20	.....	25.40	.....	.....	.....	.....	.....	.....
1,270.10	.....	7.50	125.30	.....	.....	.....	.....	35.50
1,089.10	.....	201.00	3.00	.....	.....	.....	.....	.....
784.35	.....	48.00	.....	.....	306.40	.....	.....	.....
347.85	.....	.....	.....	.....	.....	.....	.....	.....
80.60	.....	.....	.....	.....	.....	.....	.....	.....
15,510.59	.....	4,044.09	752.60	777.36	16,948.04	190.00	184.96	37.00
.....	.....	1,796.27	.....	249.00	9,761.47	.....	2,018.84	.....
.....	.....	22.75	345.15	.....	1.50	.....	.....	.....
491.35	.....	.....	194.50	.....	.....	.....	.....	3.50
1,145.80	.....	.....	12.75	.....	225.70	.....	.....	.....
786.18	.....	320.00	9.00	.....	15.00	.....	.....	.....
880.45	.....	16.00	7.75	.50	.....	.....	.....	31.00
276.95	.....	.....	74.50	.....	.....	.....	.....	3.50
589.95	.....	.....	256.27	.....	81.75	.....	.....	.....
390.25	.....	.....	.....	.....	.....	.....	.....	.....
269.25	.....	.....	.....	.....	.....	.....	.....	12.35
322.00	.....	34.67	.....	.....	.....	.....	.....	41.50
1,022.00	.....	.....	1,075.45	.....	.....	.....	.....	.....
1,195.30	.....	.....	.....	.....	.....	.....	.....	.....
1,613.55	.....	1.50	.....	.....	142.50	.....	.....	.....
8,983.03	.....	2,191.19	1,975.37	249.50	10,227.92	.....	2,018.84	91.85

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	TRANSPORTATION OF THE ARMY.					
	Railroad transportation.	Water transportation.	Express-age.	Wagon transportation.	Stage transportation.	Civilian employés pay of.
Department of Texas.						
Headquarters, San Antonio, Tex.	$18,489.28	$1,007.08	$310.39	$15,544.58	$1,826.70	$16,800.09
Eagle Pass, camp at, Tex.						
Fort Hancock, Tex.						
Fort Bliss (and El Paso), Tex.						2,520.00
Fort Sam Houston, Tex						1,420.00
Camp Pena Colorado, Tex						406.00
Fort Ringgold, Tex						2,302.00
Fort McIntosh, Tex						5,807.34
Fort Clark, Tex				99.56		2,362.00
Fort Brown, Tex						1,307.00
Total	18,489.28	1,007.08	310.39	15,644.14	1,826.70	32,924.43
Department of California.						
Headquarters, San Francisco, Cal				2,623.68		3,301.33
Presidio of San Francisco, Cal.						9,402.99
Fort Mason, Cal.						
Alcatraz Island, Cal						660.00
Angel Island, Cal						660.00
Benicia Barracks, Cal.						
Fort Bidwell, Cal.						533.33
In the field						
Total				2,623.68		14,557.65
Department of Arizona.						
Headquarters, Los Angeles, Cal.	5,663.12		655.08	32,114.37	3,108.36	7,042.97
Whipple Barracks, Ariz.						2,057.33
Fort Huachuca, Ariz.						3,402.65
Fort Wingate, N. Mex.				314.98		4,721.66
Fort Bayard, N. Mex				142.81		2,894.00
Fort Stanton, N. Mex.					10.00	2,775.00
San Carlos, Ariz.						4,268.33
Fort Apache, Ariz.						4,440.67
Fort Grant, Ariz						5,352.00
Fort Bowie, Ariz						3,554.66
San Diego Barracks, Cal.						514.00
Fort Marcy, N. Mex.				10.41		329.01
In the field						
Total	5,663.12		655.08	32,582.57	3,118.36	41,352.28
Department of the Columbia.						
Headquarters, Vancouver Barracks, Wash.	31.27	465.85	9.80	260.97	90.00	13,496.45
Portland, Oregon	95.03	2,152.04	278.44	2,119.05	346.07	1,333.30
Fort Wallawalla, Wash						4,656.63
Boise Barracks, Idaho.						1,532.00
Fort Sherman, Idaho.		17.00				3,475.00
Fort Townsend, Wash		4.60		555.96		480.00
Fort Canby, Wash						600.00
Fort Spokane, Wash						2,907.53
In the field						
Total	126.30	2,639.49	288.24	2,935.98	436.07	28,480.91

appropriations made for the Quartermaster's Department, etc.—Continued.

TRANSPORTATION OF THE ARMY.

Extra-duty pay of enlisted men.	Vessels—purchasing, chartering, operating, and maintaining.	Means of transportation—purchasing and repairing wagons, carts, etc.	Animals—purchase, stabling, etc., of.	Harness—purchase and repair of.	Water supply and sewerage.	Wharves and bridges.	Roads, harbors, and rivers.	Tolls on ferries, bridges, etc.
$2,146.55	.....	$1,128.91	$6,504.00	$839.93	$14,173.85	.....	$58.00	.....
480.20	.....	84.45	.....	.....	304.66	.....	.....	.....
850.68	.....	.....	.....	.....	.....	.....	.....	.....
701.50	.....	1.00	.....	.....	4,011.25	.....	1,043.40	.....
1,540.25	.....	139.21	35.80	.....	547.45	.....	100.00	.....
451.90	.....	.....	.....	.....	.....	.....	.....	.....
1,451.90	.....	48.00	67.70	.....	.....	.....	.....	.....
1,288.80	.....	1.00	.....	.....	248.45	.....	.....	.....
1,818.90	.....	215.00	.....	.....	.....	.....	.....	.....
508.95	.....	27.00	.....	25.50	99.00	.....	.....	.....
11,239.63	.....	1,644.57	6,607.50	865.43	19,384.66	.....	1,201.40	.....
.....	$21,107.02	39.50	5,055.00	5.50	2,474.00	$2,737.25	.....	.....
1,701.70	.....	20.50	.....	.....	131.45	.....	.....	.....
656.73	.....	214.00	.....	.....	177.00	333.00	.....	.....
171.15	.....	.....	.....	.....	194.00	.....	.....	.....
565.55	.....	.....	20.00	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
433.70	.....	47.60	.....	.....	717.44	.....	.....	.....
362.60	.....	68.45	.....	.....	34.00	.....	.....	.....
3,891.43	21,107.02	390.05	5,075.00	5.50	3,727.89	3,070.25	.....	.....
.....	.....	1,715.82	638.62	108.20	7,621.18	.....	47.25	.....
1,150.90	.....	133.60	.....	.....	.....	.....	.....	.....
1,077.05	.....	.....	56.82	.....	.....	.....	.....	.....
1,542.10	.....	3.50	12.92	.....	115.30	.....	.....	.....
1,575.80	.....	.....	94.80	.....	.....	.....	.....	.....
672.80	.....	.....	8.50	.....	1,269.53	.....	.....	.....
1,066.20	.....	.....	4.30	.....	53.33	.....	.....	.....
991.50	.....	14.50	.....	.....	.....	.....	.....	.....
1,210.90	.....	.....	60.32	.....	.....	.....	.....	.....
528.20	.....	.....	85.00	.....	.....	.....	.....	.....
227.50	85.00	71.00	.....	20.00	497.55	.....	.....	.....
239.75	.....	526.15	.....	105.72	2,762.55	.....	310.65	.....
406.70	.....	124.75	247.28	9.00	.....	.....	.....	$7.35
10,689.09	85.00	2,589.32	1,208.56	242.92	12,319.44	.....	357.90	7.35
2,312.95	47.43	1,868.26	.....	429.70	2,761.40	16.75	22.40	.....
.....	11.50	327.57	.....	96.12	1,298.35	.....	17.67	7.00
945.55	.....	.....	.....	161.70	1,371.50	.....	.....	15.00
333.55	.....	73.85	.....	.....	845.25	.....	.....	.....
1,530.39	.....	300.00	4.20	.....	961.24	.....	.....	.....
858.45	.....	99.99	.....	136.25	58.90	86.50	.....	.....
667.15	.....	.....	.....	.....	.....	.....	.....	.....
1,427.85	.....	3.00	.....	128.90	.....	.....	.....	.....
163.10	.....	14.25	.....	.75	.....	.....	.....	.....
8,238.99	58.93	2,686.92	4.20	953.42	7,296.64	103.25	40.07	22.00

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	TRANSPORTATION OF THE ARMY.					
	Advertising and printing.	Reimbursement of traveling expenses.	Boxes, crates, bales, etc., for stores shipped.	Lumber, rope, and miscellaneous articles.	All expenses not otherwise enumerated.	Total amounts.
General depots.						
New York, N. Y.	$558.67	$108.69	$366.75	$3,432.25	$2,875.64	$144,839.05
Philadelphia, Pa	.....	287.95	6,051.00	13.04	452.18	42,966.99
Washington, D. C	26.25	372.35	219.62	107.50	3,113.52	74,799.54
Jeffersonville, Ind	840.13	24.75	.....	4,765.10	1,792.94	62,851.78
San Francisco, Cal	75.66	167.60	1,493.64	1,259.01	5,449.43	40,688.43
St. Louis, Mo	112.13	29.00	.....	656.05	1,850.87	105,029.31
Total	1,612.84	990.34	8,131.01	10,232.95	15,534.58	471,175.20
Independent posts, recruiting stations, armories, arsenals, etc.						
Columbus Barracks, Ohio	.....	.....	.....	51.94	109.00	23,001.83
Davids Island, N. Y	.....	30.00	.....	.....	277.50	13,262.67
Jefferson Barracks, Mo	32.55	.....	.....	123.62	41.27	13,413.73
Willets Point, N. Y	.....	.....	.....	.....	.....	4,438.26
West Point, N. Y	.....	15.00	.....	.....	10.00	4,345.05
Hot Springs, Ark	.....	.....	.....	37.15	.....	1,294.12
Fort Leavenworth Military Prison, Kans	.....	.....	291.43	567.10	.....	6,062.28
U. S. Powder Depot, N. J	.....	.....	.....	.....	.....	.....
Fort Snelling Ordnance Depot, Minn	.....	.....	.....	.....	440.25	1,134.27
Augusta Arsenal, Ga	.....	.....	.....	.....	.....	28.67
Indianapolis Arsenal, Ind	.....	.....	.....	.....	.....	.....
National Armory, Springfield, Mass	.....	.....	.....	.....	.....	352.35
Columbia Arsenal, Tenn	.....	.....	.....	.....	.....	53.15
Kennebec Arsenal, Me	.....	.....	.....	.....	.25	31.50
Watervliet Arsenal, N. Y	.....	.....	.....	.....	.....	402.57
Allegheny Arsenal, Pa	.....	.....	.....	.....	7.06	76.91
Frankford Arsenal, Pa	.....	.....	.....	.....	30.00	1,585.13
Benicia Arsenal, Cal	.....	.....	.....	.....	.....	460.28
Watertown Arsenal, Mass	.....	.....	.....	.....	227.74	645.97
Rock Island Arsenal, Ill	.....	.....	.....	.....	.....	2,140.88
United States legation at—						
London	.....	.....	.....	.....	8.50	8.50
Paris	.....	.....	.....	.....	4.24	4.24
Berlin	.....	.....	.....	.....	.....	.....
Vienna	.....	.....	.....	.....	50.00	50.00
St. Petersburg	.....	.....	.....	.....	.....	.....
Rome	.....	.....	.....	.....	.....	.....
Total	32.55	45.00	291.43	779.81	1,205.81	72,792.36
Department of the East.						
Headquarters, Governors Island, N. Y	69.85	2.00	.....	65.46	127.00	29,756.79
Baltimore, Md	9.00	.....	.....	47.80	79.22	22,161.33
Buffalo, N. Y	.....	11.25	.....	27.56	24.50	4,789.55
Boston, Mass	.....	9.25	7.75	101.60	74.88	21,837.31
Fort Monroe, Va	.....	.....	.....	.....	1,542.63	14,142.16
New Orleans, La	.....	2.50	.....	216.66	16.50	10,201.40
Washington Barracks, D. C	.....	.....	.....	95.14	78.02	1,964.07
Newport Barracks, Ky	.....	3.00	.....	.....	.....	627.31
Jackson Barracks, La	.....	.....	.....	21.90	535.00	3,460.33
St. Francis Barracks, Fla	.....	.....	.....	121.19	367.20	1,156.35
Fort Warren, Mass	16.50	.....	.....	.....	.....	2,169.89
Mount Vernon Barracks, Ala	.....	16.10	.....	5.53	1,694.09	6,998.09
Fort Preble, Me	.....	.....	.....	12.10	21.87	2,450.48
Fort Trumbull, Conn	.....	.....	.....	.....	10.00	1,070.01
Fort Adams, R. I	.....	.....	.....	10.86	706.75	9,761.75
Fort Thomas, Ky	.....	.....	.....	64.95	228.40	8,123.66
Fort Myer, Va	.....	.....	.....	9.80	444.13	2,448.20
Fort Hamilton, N. Y. Harbor	.....	.....	.....	.....	60.00	5,787.45
Fort Wood, N. Y. Harbor	.....	.....	.....	.....	.....	810.21
Fort McHenry, Md	.....	1.70	.....	20.00	106.00	1,319.42
Fort Schuyler, N. Y	.....	1.25	.....	.....	.....	2,428.60
Fort Wadsworth, N. Y	.....	6.00	.....	92.86	693.80	3,716.48
Fort Porter, N. Y	.....	.....	.....	126.00	471.50	1,493.87
Fort Ontario, N. Y	.....	.....	.....	24.50	.....	787.59

appropriations made for the Quartermaster's Department, etc.—Continued.

Shooting galleries and ranges—construction and repairs, etc., of.	BARRACKS AND QUARTERS.					
	Hire of quarters for officers and enlisted men.	Hire of offices.	Hire of storehouses.	Hire of stables and grounds.	Advertising.	Hire of mechanics and other employés.
	$181.99			$1,350.00	$21.60	$1,130.00
		$2,366.04				
	653.00	45.00		2,016.66	58.35	
$48.50		2,999.96	$1,500.00			1,080.00
		5,316.74		330.00		
48.50	834.99	17,727.74	1,500.00	3,696.66	79.95	2,210.00
					3.90	
					21.23	
					165.15	
		144.00				
		162.66				
		510.00				
		144.00				
		302.40				
		150.00				
		1,413.06			190.28	
					204.45	3,960.00
	113.20	600.00				
		750.00				
		1,728.31				
24.00					34.41	
		900.00	999.96			
.93						
2.73						
2.04						
97.50						
12.83						
16.04						
15.50				50.00		
120.30						
	132.00					
15.00						
19.50						
17.48						
16.50						
.97						

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	TRANSPORTATION OF THE ARMY.					
	Advertising and printing.	Reimbursement of traveling expenses.	Boxes, crates, bales, etc., for stores shipped.	Lumber, rope, and miscellaneous articles.	All expenses not otherwise enumerated.	Total amounts
Department of the East—Cont'd.						
Key West Barracks, Fla	.....	$6.00	.....	.....	$558.82	$5,577.31
Fort Barrancas, Fla	$60.67	67.00	.....	$783.20	4,972.84	29,336.59
Madison Barracks, N. Y	75.85	.....	.....	.....	47.83	13,834.18
Plattsburg Barracks (and Sackets Harbor), N. Y	136.38	137.24	.....	25.74	2,849.03	22,963.71
Fort Niagara, N. Y	.....	.....	.....	.....	88.00	3,971.21
Fort McPherson (and Atlanta), Ga	49.40	27.85	.....	5.05	929.27	11,039.39
Fort Ethan Allen, Vt	.....	.....	.....	.....	884.88	1,512.77
Total	417.65	291.14	$7.75	1,877.90	17,612.16	247,697.96
Department of the Missouri.						
Headquarters, Chicago, Ill	51.61	45.65	.....	534.79	716.46	86,567.37
Fort Leavenworth, Kans	.....	.....	.....	777.22	526.80	23,726.24
Fort Riley, Kans	.....	.....	.....	67.53	4,706.42	24,044.89
Fort Wayne, Mich	.....	.....	.....	146.50	161.00	3,688.83
Fort Brady, Mich	.....	.....	.....	.....	360.00	2,564.23
Fort Mackinac, Mich	.....	.....	.....	.....	.....	1,023.85
Fort Sheridan, Ill	78.15	13.55	.....	9.66	8,061.25	28,660.85
Fort Reno, Okla	.....	.....	.....	.....	.....	12,277.08
Oklahoma, Okla	.....	.....	.....	20.00	.....	51.70
Fort Supply, Ind. T	.....	.....	.....	.....	.....	6,077.86
Fort Sill, Okla	.....	.....	.....	30.30	.....	7,696.86
Sault de Ste. Marie, Mich	.....	.....	.....	4.80	310.54	3,628.99
Total	129.76	59.20	.....	1,590.80	14,842.47	200,008.75
Department of the Platte.						
Headquarters, Omaha, Nebr	112.11	498.93	372.35	1,844.68	930.20	100,208.59
Denver, Colo	.....	21.70	.....	78.08	.....	80,970.05
Fort McKinney, Wyo	.....	.....	.....	.....	73.50	6,059.00
Fort Robinson, Nebr	.....	.....	.....	300.00	464.77	10,518.49
Fort Washakie, Wyo	.....	.....	.....	62.48	.....	3,170.09
Fort Niobrara, Nebr	.....	.....	.....	.....	73.75	11,147.44
Fort Randall, S. Dak	.....	.....	.....	.....	.....	1,423.85
Fort Omaha, Nebr	.....	.....	.....	.....	950.68	8,603.09
Fort Douglas, Utah	.....	.....	.....	.....	28.05	5,323.01
Camp Pilot Butte, Wyo	.....	.....	.....	.....	.....	380.60
Fort Du Chesne, Utah	.....	.....	.....	.....	56.00	3,999.40
Fort D. A. Russell, Wyo	.....	58.90	.....	.....	123.20	14,106.83
Fort Logan, Colo	.....	.....	.....	.....	45.60	4,811.35
Fort Sidney, Nebr	.....	.....	.....	.....	82.95	2,905.91
Bellevue Rifle Range, Nebr	.....	.....	.....	.....	.....	80.60
Total	112.11	579.53	372.35	2,285.24	2,828.70	253,728.90
Department of Dakota.						
Headquarters, St. Paul, Minn	.....	.....	240.26	634.89	1,815.58	117,014.02
Helena, Mont	.....	114.08	.....	.....	101.25	3,698.76
Fort Custer, Mont	.....	.....	.....	.....	54.50	10,945.06
Fort Meade, S. Dak	.....	8.17	.....	.....	.....	8,350.42
Fort Missoula, Mont	.....	.....	.....	.....	.....	6,580.68
Fort Keogh, Mont	.....	.....	.....	.....	13.00	7,195.81
Fort Yellowstone, Wyo	.....	12.50	.....	.....	36.50	3,837.93
Fort Sully, S. Dak	.....	3.60	.....	.....	.....	4,091.53
Camp Poplar River, Mont	.....	.....	.....	.....	.....	2,117.42
Fort Pembina, N. Dak	.....	.....	.....	.....	.....	2,256.56
Fort Buford, N. Dak	.....	.....	.....	.....	.....	5,330.00
Fort Yates, N. Dak	.....	.....	.....	.....	.....	8,257.41
Fort Assiniboine, Mont	.....	.....	.....	.....	.....	7,432.63
Fort Snelling, Minn	.....	.....	.....	.....	31.00	9,023.47
Total	.....	138.35	240.26	634.89	2,051.83	196,131.70

appropriations made for the Quartermaster's Department, etc.—Continued.

Shooting galleries and ranges—construction and repairs, etc., of.	BARRACKS AND QUARTERS.					
	Hire of quarters for officers and enlisted men.	Hire of offices.	Hire of storehouses.	Hire of stables and grounds.	Advertising.	Hire of mechanics and other employés.
$14.00						
		$165.00		$10.73	$69.45	
18.00						
333.39					12.68	
	$108.00	360.00			42.95	
		49.66				
726.71	353.20	4,552.97	$999.96	60.73	363.94	$3,960.00
90.78	1,874.40	21,254.13		1,800.00		
208.20		275.00				
99.00						
86.90						
2,591.07		200.00				825.00
81.60						
4.29						
60.25	24.00					
		360.00				
3,222.09	1,898.40	22,089.13		1,800.00		825.00
74.60	16.00	9,744.00	260.00	500.01	100.49	
		1,489.16				
5.48						
60.00						
38.03						
6.16						
47.17						
7.65		330.00				
.83						
2.63	120.00					
68.88						
212.17						
1.75						
525.35	136.00	11,563.16	260.00	500.01	100.49	
324.98	48.00					
		416.66		16.67		
						1,576.63
6.24						
3.75						
19.45						
1.50						
2.70						
1.80						
23.57						
8.10						
						1,405.00
392.09	48.00	416.66		16.67		2,981.63

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	TRANSPORTATION OF THE ARMY.					
	Advertising and printing.	Reimbursement of traveling expenses.	Boxes, crates, bales, etc., for stores shipped.	Lumber, rope, and miscellaneous articles.	All expenses not otherwise enumerated.	Total amounts.
Department of Texas.						
Headquarters, San Antonio, Tex						
Eagle Pass, camp at, Tex	$111.23	$370.16		$552.20	$1,199.36	$81,062.31
Fort Hancock, Tex					180.00	1,049.31
Fort Bliss (and El Paso), Tex					276.00	1,126.68
Fort Sam Houston, Tex					2,593.00	10,870.15
Camp Pena Colorado, Tex				119.58	512.00	4,414.29
Fort Ringgold, Tex						857.90
Fort McIntosh, Tex					450.40	4,320.00
Fort Clark, Tex		13.75			1,673.00	9,032.34
Fort Brown, Tex					771.75	5,267.21
		8.87			440.00	2,416.32
Total	111.23	392.78		671.78	8,095.51	120,416.51
Department of California.						
Headquarters, San Francisco, Cal	61.68	163.20			2,103.14	39,671.30
Presidio of San Francisco, Cal					45.50	11,302.14
Fort Mason, Cal						1,380.73
Alcatraz Island, Cal					8.00	1,033.15
Angel Island, Cal						1,245.55
Benicia Barracks, Cal						
Fort Bidwell, Cal						1,732.07
In the field					237.50	702.55
Total	61.68	163.20			2,394.14	57,067.49
Department of Arizona.						
Headquarters, Los Angeles, Cal	64.59	170.20	$90.50	695.08	11,866.54	71,601.88
Whipple Barracks, Ariz				1,511.67		4,853.50
Fort Huachuca, Ariz						4,536.52
Fort Wingate, N. Mex					291.28	7,001.74
Fort Bayard, N. Mex						4,707.41
Fort Stanton, N. Mex		7.00			450.00	5,192.83
San Carlos, Ariz						5,392.16
Fort Apache, Ariz		66.00				5,512.67
Fort Grant, Ariz						6,623.22
Fort Bowie, Ariz						4,167.86
San Diego Barracks, Cal				9.00	32.00	1,456.05
Fort Marcy, N. Mex				917.54	337.70	5,539.48
In the field					34.00	829.08
Total	64.59	243.20	90.50	3,133.29	13,011.52	127,414.40
Department of the Columbia.						
Headquarters, Vancouver Barracks, Wash	69.70	152.60		368.86	1,024.90	23,429.29
Portland, Oregon		6.00		384.13	165.04	8,637.31
Fort Wallawalla, Wash					329.45	7,479.83
Boise Barracks, Idaho						2,784.65
Fort Sherman, Idaho				133.86	19.85	6,441.54
Fort Townsend, Wash					18.30	2,298.95
Fort Canby, Wash				18.00		1,285.15
Fort Spokane, Wash					53.16	4,520.44
In the field					218.75	396.85
Total	69.70	158.60		904.85	1,829.45	57,274.01

appropriations made for the Quartermaster's Department, etc.—Continued.

Shooting galleries and ranges—construction and repairs, etc., of.	BARRACKS AND QUARTERS.					
	Hire of quarters for officers and enlisted men.	Hire of offices.	Hire of storehouses.	Hire of stables and grounds.	Advertising.	Hire of mechanics and other employés.
$408.63	$2,950.00	$80.00	.....	$1,370.83	$123.75	.....
1.15	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	384.00	.....	90.00	.....	.....
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
.83	165.00	.....	.....	.....	.....	.....
.....	96.00	.....	.....	.....	.....	.....
10.50	.....	.....	.....	.....	.....	.....
46.65	.....	.....	.....	.....	.....	.....
467.76	3,115.00	464.00	.....	1,460.83	123.75	.....
.....	144.00	11,000.00	.....	564.00	.....	.....
400.43	.....	.....	.....	.....	43.41	.....
13.38	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
5.00	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
2.75	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
421.56	144.00	11,000.00	.....	564.00	43.41	.....
245.36	924.00	7,042.50	$165.00	330.00	.....	.....
151.11	.....	.....	.....	.....	.....	.....
5.55	.....	.....	.....	.....	.....	.....
54.40	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
31.56	.....	.....	.....	.....	.....	.....
3.67	.....	.....	.....	.....	.....	.....
6.00	.....	.....	.....	.....	.....	.....
7.20	.....	.....	.....	.....	.....	.....
2.78	.....	.....	.....	.....	.....	.....
26.50	.....	.....	.....	.....	.....	.....
76.29	1,871.20	.....	.....	.....	.....	.....
.....	463.60	160.00	.....	.....	.....	.....
610.42	3,258.80	7,202.50	165.00	330.00	.....	.....
123.83	.....	102.00	38.00	.....	.....	$1,360.00
38.30	.....	1,090.00	490.00	.....	.....	.....
3.58	.....	330.00	.....	.....	.....	.....
2.09	.....	.....	.....	.....	.....	.....
58.50	.....	.....	.....	50.00	.....	.....
35.22	.....	.....	.....	.....	.....	.....
1.75	.....	.....	.....	.....	.....	.....
6.02	45.00	.....	.....	10.00	.....	.....
.....	.....	.....	55.00	118.67	.....	.....
269.29	45.00	1,522.00	583.00	178.67	.....	1,360.00

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	BARRACKS AND QUARTERS.			HOSPITALS.		
	Construction and repairs.	All expenses not otherwise enumerated.	Total amounts.	Construction and repairs.	Advertising.	Extra-duty pay of enlisted men.
General depots.						
New York, N. Y.	$774.05	$72.20	$3,529.84			
Philadelphia, Pa	318.59		2,684.63			
Washington, D. C	19,097.60	34.75	21,905.36	$49.00		
Jeffersonville, Ind	1,028.79	7.63	1,036.42			
San Francisco, Cal	4,551.43	567.84	17,699 23	260.32		
St. Louis, Mo	694.13	.40	6,341.27			
Total	26,464.59	682.82	53,196.75	309.32		
Independent posts, recruiting stations, armories, arsenals, etc.						
Columbus Barracks, Ohio	6,552.50		6,556.40	2,870.13		
Davids Island, N. Y	2,574.49	13.56	2,609.28	28.75		$15.40
Jefferson Barracks, Mo	6,050.73		6,215.88			
Willets Point, N. Y	254.86		254.86	44.58		
West Point, N. Y						
Hot Springs, Ark				1,429.84		
Fort Leavenworth Military Prison, Kans						
U. S. Powder Depot, N. J						
Fort Snelling Ordnance Depot, Minn	424.97		424.97			
Augusta Arsenal, Ga						
Indianapolis Arsenal, Ind						
National Armory, Springfield, Mass						
Columbia Arsenal, Tenn						
Kennebec Arsenal, Me						
Watervliet Arsenal, N. Y						
Allegheny Arsenal, Pa						
Frankford Arsenal, Pa						
Benicia Arsenal, Cal						
Watertown Arsenal, Mass						
Rock Island Arsenal, Ill						
United States legation at—						
London			108.00			
Paris			162.66			
Berlin			510.00			
Vienna			144.00			
St. Petersburg			302.40			
Rome			150.00			
Total	15,857.55	13.56	17,474.45	4,373.30		15.40
Department of the East.						
Headquarters, Governors Island, N. Y	10,106.72	32.40	14,303.57	599.00		
Baltimore, Md	85.50		798.70			
Buffalo, N. Y	91.60		841.60			
Boston, Mass		1.25	1,729.56			
Fort Monroe, Va	13,110.10		13,144.51	87.00		
New Orleans, La	275.18	7.50	2,182.64			
Washington Barracks, D. C	2,846.51	2.38	2,848.89	734.10		
Newport Barracks, Ky	317.99	54.60	372.59	3.68		
Jackson Barracks, La	2,283.15		2,283.15	42.50		
St. Francis Barracks, Fla	1,475.00	25.00	1,500.00	296.86		
Fort Warren, Mass	568.61	31.31	599.92	58.10		
Mount Vernon Barracks, Ala	1,638.17		1,638.17	164.70		
Fort Preble, Me	972.10		972.10			
Fort Trumbull, Conn	1,982.39		1,982.39			
Fort Adams, R. I	2,330.05		2,330.05		$2.93	
Fort Thomas, Ky	1,695.62		1,695.62	71.30		
Fort Myer, Va	763.30		895.30	49.23		
Fort Hamilton, N. Y. Harbor	3,319.78		3,319.78	43.50		
Fort Wood, N. Y. Harbor	456.05		465.05			
Fort McHenry, Md	2,630.18	3.50	2,633,68	59.50		
Fort Schuyler, N. Y	1,262.06	16.82	1,278.88	218.46		
Fort Wadsworth, N. Y	2,624.59		2,624.59	82.62		8.00
Fort Porter, N. Y	2,158.33		2,158.33	48.94		
Fort Ontario, N. Y	438.63		438.63	137.55		

appropriations made for the Quartermaster's Department, etc.—Continued.

HOSPITALS.		CLOTHING AND CAMP EQUIPAGE.						Hospital stewards' quarters—construction and repairs, etc., of.
All expenses not otherwise enumerated.	Total amounts.	Purchase of material.	Manufacture.	Advertising.	Employés.	All expenses not otherwise enumerated.	Total amounts.	
		$814,372.43	$106,940.29	$3,270.39	$38,728.86	$7,219.77	$970,531.74	
	$49.00							
		54,869.50	30,320.15		11,410.29		96,599.94	
$9.00	269.32	104,335.99	17,610.06	279.40	24,715.24	444.40	147,385.09	
		613.00			3,698.70	439.20	4,750.90	
9.00	318.32	974,190.92	154,870.50	3,549.79	78,553.09	8,103.37	1,219,267.67	
	2,870.13							$552.00
	44.15							
								43.00
	44.58					8.00	8.00	5.00
58.75	1,488.59							
		7,437.44			2,393.81	470.91	10,302.16	
						18.00	18.00	
58.75	4,447.45	7,437.44			2,393.81	496.91	10,328.16	600.00
	599.00							
	87.00					12.00	12.00	
11.08	745.18					54.00	54.00	131.00
	3.68							
	42.50							
	296.86					12.50	12.50	
	58.10					21.00	21.00	208.40
	164.70							
						14.00	14.00	79.89
						5.00	5.00	
	2.93					28.00	28.00	
	71.30							
	49.23							
	43.50					23.75	23.75	35.00
	59.50					26.25	26.25	20.50
	218.46					24.08	24.08	272.70
	90.62							
	48.94							
	137.55							

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	BARRACKS AND QUARTERS.			HOSPITALS.		
	Construction and repairs.	All expenses not otherwise enumerated.	Total amounts.	Construction and repairs.	Advertising.	Extra duty pay of enlisted men.
Department of the East—Cont'd.						
Key West Barracks, Fla	$26,022.05		$26,022.05	$808.60		
Fort Barrancas, Fla	11,034.61	$307.50	11,342.11	660.43		
Madison Barracks, N. Y	2,201.04		2,446.22	169.30		
Plattsburg Barracks (and Sackets Harbor), N. Y	146.79		146.79			
Fort Niagara, N. Y	5,083.10		5,095.78	56.00		
Fort McPherson (and Atlanta), Ga	3,927.53		4,438.48	1,467.13		
Fort Ethan Allen, Vt			49.66			
Total	101,855.73	482.26	112,628.79	5,858.50	$2.93	$8.00
Department of the Missouri.						
Headquarters, Chicago, Ill	1,744.70	47.00	26,720.23	19.91		
Fort Leavenworth, Kans	16,886.84	59.11	17,220.95	199.43		
Fort Riley, Kans	4,770.71		4,770.71	172.99		
Fort Wayne, Mich	2,034.12		2,034.12	49.53		
Fort Brady, Mich	86.69		86.69			
Fort Mackinac, Mich	774.43		774.43	134.50		
Fort Sheridan, Ill	3,676.10		4,701.10	165.00		
Fort Reno, Okla	5,327.12		5,327.12	642.40		
Oklahoma, Okla						
Fort Supply, Ind. T	1,184.82		1,184.82			
Fort Sill, Okla	2,504.16		2,528.16	786.40		127.42
Sault de Ste. Marie, Mich			360.00			
Total	38,989.69	106.11	65,708.33	2,170.16		127.42
Department of the Platte.						
Headquarters, Omaha, Nebr	23,269.75		33,890.25	731.78		
Denver, Colo	40.00		1,529.16			
Fort McKinney, Wyo	2,186.87		2,186.87			
Fort Robinson, Nebr	1,842.04		1,842.04	160.00		
Fort Washakie, Wyo	1,261.13		1,261.13			
Fort Niobrara, Nebr	2,100.22		2,100.22	361.20		
Fort Randall, S. Dak						
Fort Omaha, Nebr				122.65		
Fort Douglas, Utah	1,198.16		1,528.16	1,769.10		9.00
Camp Pilot Butte, Wyo						
Fort Du Chesne, Utah	340.00		460.00			
Fort D. A. Russell, Wyo	809.85	80.50	890.35	19.60		
Fort Logan, Colo	2,347.60		2,347.60			
Fort Sidney, Nebr				50.00		
Bellevue Rifle Range, Nebr						
Total	35,395.62	80.50	48,035.78	3,214.33		9.00
Department of Dakota.						
Headquarters, St. Paul, Minn	22,312.39	122.41	22,482.80	1,297.52		
Helena, Mont			433.33			
Fort Custer, Mont	477.00		2,053.63	230.00		
Fort Meade, S. Dak	2,278.77		2,278.77	207.19		
Fort Missoula, Mont	451.28		451.28	25.00		
Fort Keogh, Mont	558.91		558.91	220.50		10.00
Fort Yellowstone, Wyo	70.00		70.00			
Fort Sully, S. Dak	290.14	15.67	305.81			
Camp Poplar River, Mont						5.00
Fort Pembina, N. Dak	1,029.32		1,029.32			
Fort Buford, N. Dak	516.50		516.50	18.00		
Fort Yates, N. Dak	945.90	57.85	1,003.75			
Fort Assiniboine, Mont		.23	.23			108.00
Fort Snelling, Minn	48.00		1,453.00			
Total	28,978.21	196.16	32,637.33	1,998.21		123.00

appropriations made for the Quartermaster's Department, etc.—Continued.

HOSPITALS.		CLOTHING AND CAMP EQUIPAGE.						Hospital stewards' quarters—construction and repairs, etc., of.
All expenses not otherwise enumerated.	Total amounts.	Purchase of material.	Manufacture.	Advertising.	Employés.	All expenses not otherwise enumerated.	Total amounts.	
	$808.60							
	660.43					$3.00	$3.00	
	169.30							$4.00
	56.00							92.86
$24.35	1,491.48					57.25	57.25	
35.43	5,904.86					280.83	280.83	844.35
	19.91							
4.96	204.39							
	172.99					31.50	31.50	
	49.53					9.00	9.00	
	134.50							
	165.00					31.53	31.53	
	642.40							
	913.82							
4.96	2,302.54					72.03	72.03	
	731.78					75.00	75.00	1,030.48
	160.00							
	361.20							
	122.65							
	1,778.10							
	19.60							
						14.50	14.50	
	50.00							
	3,223.33					89.50	89.50	1,030.48
15.52	1,313.04					220.00	220.00	75.97
	230.00							110.00
	207.19					196.75	196.75	
	25.00					21.00	21.00	17.00
	230.50					45.00	45.00	
	5.00							
						33.00	33.00	10.00
	18.00					82.80	82.80	
						268.88	268.88	40.00
	108.00					99.18	99.18	
						81.00	81.00	
15.52	2,136.73					1,047.61	1,047.61	252.97

C.—*Statement showing in detail the amounts expended from the various*

General depots, independent posts, etc., and departments.	BARRACKS AND QUARTERS.			HOSPITALS.		
	Construction and repairs.	All expenses not otherwise enumerated.	Total amounts.	Construction and repairs.	Advertising.	Extra duty pay of enlisted men.
Department of Texas.						
Headquarters, San Antonio, Tex.	$26,274.62	$17.38	$30,816.58	$219.97	.....	.....
Eagle Pass, camp at, Tex	231.52	.....	231.52	48.30	.....	$10.50
Fort Hancock, Tex	.....	.....	.....	.....	.....	.....
Fort Bliss (and El Paso), Tex	.....	.....	474.00	.....	.....	.....
Fort Sam Houston, Tex	2,981.89	.....	2,981.89	.....	.....	.....
Camp Pena Colorado, Tex	122.95	.....	122.95	.....	.....	.....
Fort Ringgold, Tex	71.67	.....	238.67	.....	.....	.....
Fort McIntosh, Tex	496.17	.....	592.17	1,136.80	.....	.....
Fort Clark, Tex	151.55	150.00	301.55	.....	.....	.....
Fort Brown, Tex	377.93	.....	377.93	.....	.....	.....
Total	30,212.13	167.38	35,543.09	1,405.07	.....	10.50
Department of California.						
Headquarters, San Francisco, Cal	.....	.....	11,708.00	.....	.....	.....
Presidio of San Francisco, Cal	3,026.75	.....	3,070.16	.....	.....	.....
Fort Mason, Cal	802.90	.....	802.90	.....	.....	.....
Alcatraz Island, Cal	1,394.00	.....	1,394.00	310.50	.....	.....
Angel Island, Cal	3,598.00	.....	3,598.00	81.15	.....	.....
Benicia Barracks, Cal	1,555.95	.....	1,555.95	50.00	.....	.....
Fort Bidwell, Cal	162.75	.....	162.75	30.90	.....	.....
In the field	.....	.....	.....	.....	.....	.....
Total	10,540.35	.....	22,291.76	472.55	.....	.....
Department of Arizona.						
Headquarters, Los Angeles, Cal.	17,664.15	94.00	26,219.65	557.57	.....	.....
Whipple Barracks, Ariz	358.69	.....	358.69	260.78	.....	.....
Fort Huachuca, Ariz	4,044.70	.....	4,044.70	.....	.....	.....
Fort Wingate, N. Mex	1,355.90	.....	1,355.90	.....	.....	.....
Fort Bayard, N. Mex	1,147.83	.....	1,147.83	.....	.....	.....
Fort Stanton, N. Mex	799.74	.....	799.74	203.71	.....	.....
San Carlos, Ariz	599.65	.....	599.65	277.77	.....	.....
Fort Apache, Ariz	4.80	.....	4.80	215.04	.....	7.00
Fort Grant, Ariz	1,868.83	3.00	1,871.83	54.25	.....	.....
Fort Bowie, Ariz	.....	.....	.....	.....	.....	.....
San Diego Barracks, Cal	1,233.20	750.00	3,854.40	.....	.....	.....
Fort Marcy, N. Mex	4,189.33	.....	4,812.93	.....	.....	.....
In the field	.....	.....	.....	.....	.....	.....
Total	33,266.82	847.00	45,070.12	1,569.12	.....	7.00
Department of the Columbia.						
Headquarters, Vancouver Barracks, Wash	8,002.19	.....	9,502.19	111.50	.....	23.34
Portland, Oregon	5,849.49	.....	7,429.49	175.26	.....	.....
Fort Wallawalla, Wash	426.50	1.50	758.00	.....	.....	.....
Boise Barracks, Idaho	495.76	.....	495.76	.....	.....	37.50
Fort Sherman, Idaho	1,071.02	27.00	1,148.02	110.12	.....	.....
Fort Townsend, Wash	169.97	.....	169.97	108.25	.....	.....
Fort Canby, Wash	2,971.96	.....	2,971.96	123.90	.....	.....
Fort Spokane, Wash	225.50	19.00	299.50	.....	.....	.....
In the field	.....	2.00	175.67	.....	.....	.....
Total	19,212.39	49.50	22,950.56	629.03	.....	60.84

appropriations made for the Quartermaster's Department, etc.—Continued.

HOSPITALS.		CLOTHING AND CAMP EQUIPAGE.						Hospital stewards' quarters—construction and repairs, etc., of.
All expenses not otherwise enumerated.	Total amounts.	Purchase of material.	Manufacture.	Advertising.	Employés.	All expenses not otherwise enumerated.	Total amounts.	
	$219.97					$27.50	$27.50	
	58.80							
						9.00	9.00	
	1,136.80							$205.00
	1,415.57					36.50	36.50	205.00
						38.00	38.00	58.00
						6.00	6.00	
	310.50					19.00	19.00	
	81.15							
	50.00							
	30.90							
	472.55					63.00	63.00	58.00
	557.57							
	260.78							
	203.71							
	277.77							
	222.04							
	54.25							
	1,576.12							
	134.84							
	175.26							
$161.50	199.00							
	110.12							10.00
	108.25							
	123.90					8.00	8.00	9.75
19.88	19.88							
181.38	871.25					8.00	8.00	19.75

C.—*Statement showing in detail the amounts expended from the vario*

RECAPITULATION.

General depots, independent posts, etc., and departments.	Regular supplies.	Incidental expenses.	Cavalry and artillery horses.
General depots	$235,004.98	$135,112.12	$12,778.44
Independent posts, etc	100,746.69	35,541.64	
Department of the East	185,164.25	89,911.29	610.00
Department of the Missouri	272,017.68	78,113.26	1,466.25
Department of the Platte	270,670.52	59,933.34	11,483.96
Department of Dakota	312,621.98	52,970.46	120.00
Department of Texas	107,714.32	36,576.09	3,490.93
Department of California	80,774.77	23,866.68	735.71
Department of Arizona	286,393.52	38,063.93	
Department of the Columbia	124,512.57	23,903.56	2,356.10
Total	1,975,621.28	573,992.37	33,040.79

appropriations made for the Quartermaster's Department, etc.—Continued.

RECAPITULATION.

Transportation of the Army.	Shooting galleries and ranges.	Barracks and quarters.	Hospitals.	Hospital stewards' quarters.	Clothing and equipage.	Total.
$471,175.20	$48.50	$53,196.75	$318.32	.....	$1,219,267.67	$2,126,901.98
72,792.36	.....	17,474.45	4,447.45	$600.00	10,328.16	241,930.75
247,697.96	726.71	112,628.79	5,904.86	844.35	280.83	643,769.04
200,008.75	3,222.09	65,708.33	2,302.54	.....	72.03	622,910.93
253,728.90	525.35	48,035.78	3,223.33	1,030.48	89.50	648,722.56
196,131.70	392.09	32,637.33	2,136.73	252.97	1,047.61	598,310.87
120,416.51	467.76	35,543.09	1,415.57	205.00	36.50	305,865.77
57,067.49	421.56	22,291.76	472.55	58.00	63.00	185,751.52
127,414.40	610.42	45,070.12	1,576.12	.....	.....	499,128.51
57,274.01	269.29	22,950.56	871.25	19.75	8.00	232,165.09
1,803,707.28	6,683.77	455,536.96	22,668.72	3,010.55	1,231,193.30	6,105,455.02

C, SUPPLEMENTAL.—*Statement showing in detail amounts expended from the various appro- independent posts, etc., and departments of the Army, as shown by the accounts of officers*

General depots, independent posts, etc., and departments.	REGULAR SUPPLIES.						
	Forage and straw.	Fuel.	Heating and cooking apparatus, and repairs to same.	Illuminating supplies.	Stationery.	Advertising.	Printing.
General depots.							
Washington, D. C	$4.00					$12.22	
San Francisco, Cal					$362.28		
Philadelphia, Pa							
St. Louis, Mo							
Jeffersonville, Ind			$2,143.89	$7,394.12	3,874.76	42.83	
New York, N. Y			30.00	2,483.00	33.12		
Total	4.00		2,173.89	9,877.12	4,270.16	55.05	
Independent posts, etc.							
Sackets Harbor, N. Y							$20.25
Davids Island, N. Y. Harbor			925.00				
Columbus Barracks, Ohio			1,890.00	134.00		9.10	
West Point, N. Y						49.60	
Jefferson Barracks, Mo			5,490.00	220.00			
El Paso, Tex							
Sault de Ste. Marie, Mich			9,141.52				
Willets Point, N. Y. Harbor			984.00				
Atlanta, Ga			8,155.00	280.00			
Plattsburg, N. Y							
Total			26,585.52	634.00		58.70	20.25
Department of the East.							
Governors Island, N. Y						25.28	
Fort Hamilton, N. Y. Harbor			650.00				
Fort Wadsworth, N. Y							
Fort Schuyler, N. Y							
Fort Porter, N. Y							
Fort Niagara, N. Y			190.00				
Fort Thomas, Ky			356.00				
Mount Vernon Barracks, Ala							
Fort Monroe, Va			1,760.00				
Fort Preble, Me							
Fort Adams, Mass							
Boston, Mass	52.58						
Buffalo, N. Y							
Baltimore, Md							
New Orleans, La							
Total	52.58		2,956.00			25.28	
Department of the Missouri.							
Chicago, Ill	12,934.42	$2,741.81	710.00			219.73	36.00
Fort Sheridan, Ill	63.53		9,831.80	2,200.80			
Fort Leavenworth, Kans			20,521.82	160.00		33.60	
Fort Reno, Okla							
Military Prison, Fort Leavenworth, Kans							
Fort Riley, Kans							
Fort Sill, Okla	224.89	24.00					
Fort Supply, Ind. T							
Total	13,222.84	2,495.81	31,063.62	2,360.80		253.33	36.00
Department of the Platte.							
Omaha, Nebr	9,486.91	2,985.79				101.03	
Denver, Colo							
Fort Robinson, Nebr	7.00						
Total	9,493.91	2,985.79				101.03	

priations for the Quartermaster's Department for the fiscal year 1892, in the general depots, received since the preparation of the annual report for the fiscal year ending June 30, 1892.

REGULAR SUPPLIES.					INCIDENTAL EXPENSES.			
Tableware and mess furniture.	Garden utensils and agricultural implements.	Employés.	All expenses not otherwise enumerated.	Total amounts.	Extra-duty pay of enlisted men.	Civilian employés.	Shoeing animals, including materials.	Recovery of horses and mules.
			$531.00	$547.22				
				362.28				
$5,016.11				5,016.11				
4,200.00				4,200.00				
			856.00	14,311.60			$3,008.81	
			650.00	3,196.12			194.03	
9,216.11			2,037.00	27,633.33			3,202.84	
				20.25				
				925.00				
				2,033.10				
				49.60				
				5,710.00				
				9,141.52				
				984.00				
				8,435.00				
				27,398.47				
				25.28				
			950.00	1,600.00				
			258.60	448.60				
			27.00	383.00				
			1,080.00	2,840.00				
				52.58				
			1.20	1.20				
			2,316.80	5,350.66				
			123.75	16,495.71				
				12,096.13				
				20,715.42				
2,109.22			2,429.39	4,538.61				
		$75.00	82.00	405.89	$167.50	$100.00		$25.00
2,109.22		75.00	2,635.14	54,251.76	167.50	100.00		25.00
				12,573.73				
			1,451.00	1,451.00				
				7.00				
			1,451.00	14,031.73				

C, SUPPLEMENTAL.—*Statement showing in detail the amounts expended from*

General depots, independent posts, etc., and departments.	REGULAR SUPPLIES.						
	Forage and straw.	Fuel.	Heating and cooking apparatus, and repairs to same.	Illuminating supplies.	Stationery.	Advertising.	Printing.
Department of Dakota.							
St. Paul, Minn	$25,055.83	$2,892.55	$247.14	$2,702.21	$8.30	$115.05	$157.57
Helena, Mont	5.81	247.78					
Fort Snelling, Minn							
Fort Custer, Mont	7.98						
Fort Keogh, Mont							
Fort Yates, N. Dak							
Fort Pembina, N. Dak							
Fort Assiniboine, Mont							
Fort Meade, S. Dak							
Total	25,069.12	3,140.33	247.14	2,702.21	8.30	115.05	157.57
Department of Texas.							
San Antonio, Tex	9,156.22				112.26	90.60	
Fort Ringgold, Tex							
Fort Bliss, Tex							
Fort Clark, Tex							
Total	9,156.22				112.26	90.60	
Department of California.							
San Francisco, Cal							
Presidio of San Francisco, Cal							
Angel Island, Cal							
Total							
Department of Arizona.							
Los Angeles, Cal	19,886.24	1,555.10	762.00	11.95		679.46	612.29
Fort Marcy, N. Mex							
Fort Grant, Ariz	39.34						
Fort Bayard, N. Mex	9.72						
Fort Apache, Ariz							
Fort Stanton, N. Mex							
Fort Wingate, N. Mex							
San Carlos, Ariz							
Total	19,935.30	1,555.10	762.00	11.95		679.46	612.29
Department of the Columbia.							
Vancouver Barracks, Wash						98.26	
Portland, Oregon		322.79	72.15		24.83		
Fort Spokane, Wash							
Boise Barracks, Idaho							
Total		322.79	72.15		24.83	98.26	

the various appropriations for the Quartermaster's Department, etc.—Continued.

REGULAR SUPPLIES.					INCIDENTAL EXPENSES.			
Tableware and mess furniture.	Garden utensils and agricultural implements.	Employés.	All expenses not otherwise enumerated.	Total amounts.	Extra-duty pay of enlisted men.	Civilian employés.	Shoeing animals, including materials.	Recovery of horses and mules.
			$175.99	$31,354.64				
				253.59				
				7.98				
							$17.50	
			175.99	31,616.21			17.50	
				9,359.08				
						$120.85		
				9,359.08		120.85		
				23,507.04				
				39.34				
				9.72				
						94.55		
				23,556.10		94.55		
				98.26	$28.50			
$10.70			164.14	594.61				
10.70			164.14	692.87	28.50			

C, SUPPLEMENTAL.—*Statement showing in detail the amounts expended from*

General depots, independent posts, etc., and departments.	INCIDENTAL EXPENSES.						
	Interments of officers and enlisted men.	Telegraph and telephone services.	Subscription to newspapers and publications.	Office furniture.	Apprehension and delivery of deserters.	All expenses not otherwise enumerated.	Total amount.
General depots.							
Washington, D. C		$3.22				$0.40	$3.62
San Francisco, Cal							
Philadelphia, Pa							
St. Louis, Mo					$60.00	7,300.00	7,360.00
Jeffersonville, Ind				$498.50		5,615.83	9,123.14
New York, N. Y				253.00	60.00	2,233.24	2,740.27
Total		3.22		751.50	120.00	15,149.47	19,227.03
Independent posts, etc.							
Sackets Harbor, N. Y							
Davids Island, N. Y. Harbor							
Columbus Barracks, Ohio							
West Point, N. Y							
Jefferson Barracks, Mo							
El Paso, Tex							
Sault de Ste. Marie, Mich							
Willets Point, N. Y. Harbor							
Atlanta, Ga							
Plattsburg, N. Y							
Total							
Department of the East.							
Governors Island, N. Y		24.28					24.28
Fort Hamilton, N. Y. Harbor							
Fort Wadsworth, N. Y							
Fort Schuyler, N. Y	$15.00	3.80					18.80
Fort Porter, N. Y							
Fort Niagara, N. Y							
Fort Thomas, Ky							
Mount Vernon Barracks, Ala							
Fort Monroe, Va							
Fort Preble, Me							
Fort Adams, Mass							
Boston, Mass							
Buffalo, N. Y							
Baltimore, Md							
New Orleans, La							
Total	15.00	28.08					43.08
Department of the Missouri.							
Chicago, Ill					60.00	2.00	62.00
Fort Sheridan, Ill			$7.50			463.25	470.75
Fort Leavenworth, Kans							
Fort Reno, Okla							
Military Prison, Fort Leavenworth, Kans							
Fort Riley, Kans							
Fort Sill, Okla							292.50
Fort Supply, Ind. T							
Total			7.50		60.00	465.25	825.25
Department of the Platte.							
Omaha, Nebr				37.50	60.00		97.50
Denver, Colo							
Fort Robinson, Nebr							
Total				37.50	60.00		97.50

the various appropriations for the Quartermaster's Department, etc.—Continued.

CAVALRY AND ARTILLERY HORSES.				TRANSPORTATION OF THE ARMY.					
Purchase of cavalry and artillery horses.	Advertising.	All expenses not otherwise enumerated.	Total amounts.	Railroad transportation.	Water transportation.	Expressage.	Wagon transportation.	Stage transportation.	Civilian employés, pay of.
				$561.79	$12.21	$89.17			
				624.65	274.46	5.25		$105.00	
				448.02		5.25			
$14,376.10			$14,376.10	5,425.19					
				6,105.15	42.47		$0.75		
				28,331.33	667.18	15.15			
14,376.10			14,376.10	41,496.13	996.32	114.82	.75	105.00	
				1,776.57					
				1,776.57					
				263.03	8.02	1.12			
				246.19	232.52			58.21	
				2,390.74	55.09				
				1,331.28	7.77				
				4,231.24	303.40	1.12		58.21	
2,400.00	$51.84	$102.00	2,553.84	80,651.04	63.76	.45	2,562.51	13.00	
				225.22					
								136.00	$480.00
2,400.00	$51.84	$102.00	2,553.84	80,876.26	63.76	.45	2,562.51	149.00	480.00
3,849.59			3,849.59	17,329.02		3.51	1,676.49	98.02	
				49,170.44					
3,849.59			3,849.59	66,499.46		3.51	1,676.49	98.02	

C, SUPPLEMENTAL.—*Statement showing in detail the amounts expended from*

General depots, independent posts, etc., and departments.	INCIDENTAL EXPENSES.						
	Interments of officers and enlisted men.	Telegraph and telephone services.	Subscription to newspapers and publications.	Office furniture.	Apprehension and delivery of deserters.	All expenses not otherwise enumerated.	Total amounts.
Department of Dakota.							
St. Paul, Minn	.....	$35.31	.....	$596.06	.....	$117.91	$749.28
Helena, Mont	.....	.....	.....	.....	.....	.....	.....
Fort Snelling, Minn	.....	.....	.....	.....	$60.00	.....	60.00
Fort Custer, Mont	.....	.....	.....	.....	.....	.....	.....
Fort Keogh, Mont	.....	.....	.....	.....	.....	.....	17.50
Fort Yates, N. Dak	.....	.....	.....	.....	.....	.....	.....
Fort Pembina, N. Dak	.....	.....	.....	.....	.....	.....	.....
Fort Assiniboine, Mont	.....	.....	.....	.....	.....	.....	.....
Fort Meade, S. Dak	.....	.....	.....	.....	.....	.....	.....
Total	.....	35.31	.....	596.06	60.00	117.91	826.78
Department of Texas.							
San Antonio, Tex	.....	3.88	.....	28.50	.....	53.75	86.13
Fort Ringgold, Tex	.....	.....	.....	.....	.....	.....	120.85
Fort Bliss, Tex	.....	.....	.....	.....	.....	.....	.....
Fort Clark, Tex	.....	.....	.....	.....	.....	.....	.....
Total	.....	3.88	.....	28.50	.....	53.75	206.98
Department of California.							
San Francisco, Cal	.....	.83	.....	.....	.....	.....	.83
Presidio of San Francisco, Cal	.....	.....	.....	.....	.....	.....	.....
Angel Island, Cal	.....	.....	.....	.....	.....	.....	.....
Total	.....	.83	.....	.....	.....	.....	.83
Department of Arizona.							
Los Angeles, Cal	.....	189.52	.....	336.50	.....	10.00	536.02
Fort Marcy, N. Mex	.....	.....	.....	.....	.....	.....	.....
Fort Grant, Ariz	.....	.....	.....	.....	.....	.....	.....
Fort Bayard, N. Mex	.....	.....	.....	.....	60.00	8.50	68.50
Fort Apache, Ariz	.....	.....	.....	.....	.....	.....	.....
Fort Stanton, N. Mex	.....	.....	.....	.....	.....	.....	.....
Fort Wingate, N. Mex	.....	.....	.....	.....	.....	.....	.....
San Carlos, Ariz	.....	.....	.....	.....	.....	.....	94.55
Total	.....	189.52	.....	336.50	60.00	18.50	699.07
Department of the Columbia.							
Vancouver Barracks, Wash	.....	.....	.....	.....	.....	.....	28.50
Portland, Oregon	.....	.....	.....	157.20	.....	3.70	160.90
Fort Spokane, Wash	.....	.....	.....	.....	.....	.....	.....
Boise Barracks, Idaho	.....	.....	.....	.....	.....	.....	.....
Total	.....	.....	.....	157.20	.....	3.70	189.40

he various appropriations for the Quartermaster's Department, etc.—Continued.

CAVALRY AND ARTILLERY HORSES.				TRANSPORTATION OF THE ARMY.					
Purchase of cavalry and artillery horses.	Advertising.	All expenses not otherwise enumerated.	Total amounts.	Railroad transportation.	Water transportation.	Express-age.	Wagon transportation.	Stage transportation.	Civilian employés, pay of.
.....	$55.67	.....	$55.67	$60,944.84	$397.35	$235.66	$828.59	$249.50	.....
$12,689.21	.....	.....	12,689.21	188.65	.....	.....	.....	3.00	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
12,689.21	55.67	.....	12,744.88	61,133.49	397.35	235.66	828.59	252.50	.....
.....	.....	.....	.....	3,310.09	24.90	2.25	2,255.47	12.00	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	$238.00
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	3,310.09	24.90	2.25	2,255.47	12.00	238.00
1,913.70	.....	$45.00	1,958.70	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1,913.70	.....	45.00	1,958.70	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	131.04	.....	.....	6,529.92	372.25	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	131.04	.....	.....	6,529.92	372.25	.....
.....	4.27	.....	4.27	.....	16.25	.....	.....	.....	.....
.....	.....	.....	.....	12.70	315.51	.....	53.83	27.50	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	4.27	.....	4.27	12.70	331.76	.....	53.83	27.50	.....

C, SUPPLEMENTAL.—*Statement showing in detail the amounts expended from*

General depots, independent posts, etc., and departments.	TRANSPORTATION OF THE ARMY.						
	Extra-duty pay of enlisted men.	Vessels—purchasing, chartering, operating, and maintaining.	Means of transportation—purchasing and reparing wagons, carts, etc.	Animals—purchase, stabling, etc., of.	Harness—purchase and repair of.	Water supply and sewerage.	Wharves and bridges.
General depots.							
Washington, D. C.						$2,795.91	
San Francisco, Cal							
Philadelphia, Pa							
St. Louis, Mo							
Jeffersonville, Ind			$26,426.23			5,330.00	
New York, N. Y		$141.96				1,341.98	$45.17
Total		141.96	26,426.23			9,467.89	45.17
Independent posts, etc.							
Sackets Harbor, N. Y						19,275.35	
Davids Island, N. Y. Harbor						635.00	
Columbus Barracks, Ohio						1,942.00	
West Point, N. Y							
Jefferson Barracks, Mo						4,320.00	
El Paso, Tex						44,967.65	
Sault de Ste. Marie, Mich						6,072.46	
Willets Point, N. Y. Harbor						2,301.00	1,197.56
Atlanta, Ga						2,239.00	
Plattsburg, N. Y							
Total						81,752.96	1,197.56
Department of the East.							
Governors Island, N. Y							
Fort Hamilton, N. Y. Harbor							
Fort Wadsworth, N. Y							
Fort Schuyler, N. Y	$2.45					1,075.00	
Fort Porter, N. Y	2.80					2,200.00	
Fort Niagara, N. Y						10,590.00	
Fort Thomas, Ky						213.00	
Mount Vernon Barracks, Ala							
Fort Monroe, Va						1,580.30	
Fort Preble, Me							
Fort Adams, Mass							
Boston, Mass							
Buffalo, N. Y							
Baltimore, Md							
New Orleans, La							
Total	5.25					15,658.30	
Department of the Missouri.							
Chicago, Ill			76.86			50.57	
Fort Sheridan, Ill						8,455.40	2,843.71
Fort Leavenworth, Kans						7,091.11	
Fort Reno, Okla						1,800.00	
Military Prison, Fort Leavenworth, Kans						506.46	
Fort Riley, Kans			366.00			200.00	
Fort Sill, Okla	199.95						
Fort Supply, Ind. T							
Total	199.95		442.86			18,103.54	2,843.71
Department of the Platte.							
Omaha, Nebr						36,420.97	
Denver, Colo							
Fort Robinson, Nebr						50.00	
Total						36,470.97	

the various appropriations for the Quartermaster's Department, etc.—Continued.

TRANSPORTATION OF THE ARMY.								Shooting galleries and ranges—construction and repairs, etc., of.
Roads, harbors, and rivers.	Tolls on ferries, bridges, etc.	Advertising and printing.	Reimbursement of traveling expenses.	Boxes, crates, bales, etc., for stores shipped.	Lumber, rope, and miscellaneous articles.	All expenses not otherwise enumerated.	Total amounts.	
$2,915.44			$17.30				$6,391.82	
							1,009.36	
			3.30	$293.55			750.12	
							5,425.19	
		$118.15			$307.74		38,330.49	
						$41.64	30,584.41	
2,915.44		118.15	20.60	293.55	307.74	41.64	82,491.39	
7,581.28		25.41					26,882.04	
							635.00	
4,515.27							8,233.84	
6,420.27						475.00	11,215.27	
							44,967.65	
5,083.00							11,155.46	
							3,498.56	
2,108.40							4,347.40	
6,143.92		5.49					6,149.41	
31,852.14		30.90				475.00	117,084.63	
		25.28					25.28	
					3.00		1,080.45	
							2,202.80	
		13.60					10,603.60	$49.15
5,104.03							5,317.03	
1,370.10							2,950.40	
3,189.59							3,189.59	
							272.17	
							536.92	
							2,445.83	
							1,339.05	
9,663.72		38.88			3.00		29,963.12	49.15
			1.40			58.50	83,478.09	
26,504.81		80.33				2,164.84	40,049.09	
		11.00				17.00	7,344.33	
							1,800.00	
							506.46	
						212.50	778.50	
	$60.00					50.00	925.95	82.31
26,504.81	60.00	91.33	1.40			2,502.84	134,882.42	82.31
9,734.00		35.00	3.00			10.00	65,310.01	
1,821.36							50,991.80	
							50.00	
11,555.36		35.00	3.00			10.00	116,351.81	

C, SUPPLEMENTAL.—*Statement showing in detail the amounts expended from*

General depots, independent posts, etc., and departments.	TRANSPORTATION OF THE ARMY.						
	Extra-duty pay of enlisted men.	Vessels—purchasing, chartering, operating, and maintaining.	Means of transportation—purchasing and repairing wagons, carts, etc.	Animals—purchase, stabling, etc., of.	Harness—purchase and repair of.	Water supply and sewerage.	Wharves and bridges.
Department of Dakota.							
St. Paul, Minn			$81.25		$75.00	$8,231.31	
Helena, Mont				$3.50			
Fort Snelling, Minn						750.00	
Fort Custer, Mont				2.00		58.00	
Fort Keogh, Mont							
Fort Yates, N. Dak				91.00			
Fort Pembina, N. Dak						748.00	
Fort Assiniboine, Mont						1,088.80	
Fort Meade, S. Dak							
Total			81.25	96.50	75.00	10,876.11	
Department of Texas.							
San Antonio, Tex						9,953.13	
Fort Ringgold, Tex	$232.20			39.80		532.25	
Fort Bliss, Tex						10.00	
Fort Clark, Tex						200.00	
Total	232.20			39.80		10,695.38	
Department of California.							
San Francisco, Cal							$1,792.31
Presidio of San Francisco, Cal							
Angel Island, Cal						1,259.00	
Total						1,259.00	1,792.31
Department of Arizona.							
Los Angeles, Cal			10.74	37.65			
Fort Marcy, N. Mex							
Fort Grant, Ariz							
Fort Bayard, N. Mex				16.90			
Fort Apache, Ariz							
Fort Stanton, N. Mex							
Fort Wingate, N. Mex							
San Carlos, Ariz						6.62	
Total			10.74	54.55		6.62	
Department of the Columbia.							
Vancouver Barracks, Wash							
Portland, Oregon			104.33		9.65	252.92	
Fort Spokane, Wash						240.00	
Boise Barrack, Idaho							
Total			104.33		9.65	492.92	

the various appropriations for the Quartermaster's Department, etc.—Continued.

TRANSPORTATION OF THE ARMY.								Shooting galleries and ranges—construction and repairs, etc., of.
Roads, harbors, and rivers.	Tolls on ferries, bridges, etc.	Advertising and printing.	Reimbursement of traveling expenses.	Boxes, crates, bales, etc., for stores shipped.	Lumber, rope, and miscellaneous articles.	All expenses not otherwise enumerated.	Total amounts.	
.....	.....	$102.33	.....	.....	$104.43	$13.50	$71,263.76	.....
.....	.....	.....	$20.00	.....	.....	.....	215.15	.....
.....	.....	.....	.....	.....	.....	.....	750.00	.....
.....	$3.00	.....	.....	.....	.....	.....	63.00	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	2.50	.....	17.50	.....	.....	.....	111.00	.....
.....	.....	.....	.....	.....	.....	.....	748.00	.....
.....	.....	.....	.....	.....	.....	.....	1,088.80	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	5.50	102.33	37.50	.....	104.43	13.50	74,239.71	.....
.....	.....	22.20	3.45	.....	10.08	23.73	15,617.30	.....
.....	.....	.....	.....	.....	.....	.....	1,042.25	$1.13
.....	.....	.....	.....	.....	.....	.....	10.00	.....
.....	.....	.....	.....	.....	.....	.....	200.00	.....
.....	.....	22.20	3.45	.....	10.08	23.73	16,869.55	1.13
.....	.....	.....	.....	.....	.....	.....	1,792.31	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	1,259.00	.....
.....	.....	.....	.....	.....	.....	.....	3,051.31	.....
$3,775.00	.....	318.20	19.40	.....	.....	9.60	11,203.80	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	16.90	.....
.....	.....	.....	6.50	.....	.....	.....	6.50	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
275.00	.....	.....	.....	.....	.....	.....	275.00	.....
.....	.....	.....	.....	.....	.....	.....	6.62	.....
4,050.00	.....	318.20	25.90	.....	.....	9.60	11,508.82	.....
.....	.....	3.60	.....	.....	.....	.....	19.85	.....
.....	7.00	.....	.....	.....	89.21	.....	872.65	.....
.....	.....	.....	.....	.....	.....	.....	240.00	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	7.00	3.60	.....	.....	89.21	.....	1,132.50	.....

C, SUPPLEMENTAL.—*Statement showing in detail the amounts expended from*

General depots, independent posts, etc., and departments.	BARRACKS AND QUARTERS.						
	Hire of quarters for officers and enlisted men.	Hire of storehouses.	Hire of stables and grounds.	Advertising.	Construction and repairs.	All expenses not otherwise enumerated.	Total amounts
General depots.							
Washington, D. C					$2,625.00		$2,625.00
San Francisco, Cal							
Philadelphia, Pa							
St. Louis, Mo							
Jeffersonville, Ind							
New York, N. Y					435.00		435.00
Total					3,060.00		3,060.00
Independent posts, etc.							
Sackets Harbor, N. Y							
Davids Island, N. Y. Harbor					6,295.00		6,295.00
Columbus Barracks, Ohio					4,582.00		4,582.00
West Point, N. Y							
Jefferson Barracks, Mo				$76.30	39,260.00		39,336.30
El Paso, Tex							
Sault de Ste. Marie, Mich							
Willets Point, N. Y. Harbor					3,487.00		3,487.00
Atlanta, Ga					3,551.60		3,551.60
Plattsburg, N. Y							
Total				76.30	57,175.60		57,251.90
Department of the East.							
Governors Island, N. Y							
Fort Hamilton, N. Y. Harbor					6,590.80		6,590.80
Fort Wadsworth, N. Y					80.00		80.00
Fort Schuyler, N. Y					6,697.70		6,697.70
Fort Porter, N. Y							
Fort Niagara, N. Y					3,735.34		3,735.34
Fort Thomas, Ky							
Mount Vernon Barracks, Ala							
Fort Monroe, Va					18,789.00		18,789.00
Fort Preble, Me					1,250.00		1,250.00
Fort Adams, Mass							
Boston, Mass							
Buffalo, N. Y							
Baltimore, Md							
New Orleans, La		$83.33					83.33
Total		83.33			37,142.84		37,226.17
Department of the Missouri.							
Chicago, Ill					5,721.00		5,721.00
Fort Sheridan, Ill							
Fort Leavenworth, Kans					159.78		159.78
Fort Reno, Okla							
Military Prison, Fort Leavenworth, Kans					632.26		632.26
Fort Riley, Kans							
Fort Sill, Okla	$36.00				2,704.59		2,740.59
Fort Supply, Ind. T							
Total	36.00				9,217.63		9,253.63
Department of the Platte.							
Omaha, Nebr					2,668.00		2,668.00
Denver, Colo							
Fort Robinson, Nebr					1,095.00		1,095.00
Total					3,763.00		3,763.00

the various appropriations for the Quartermaster's Department, etc.—Continued.

HOSPITALS.			CLOTHING AND CAMP EQUIPAGE.					Hospital stewards' quarters—construction and repairs, etc., of.
Construction and repairs.	Advertising.	Total amounts.	Purchase of material.	Manufacture.	Advertising.	All expenses not otherwise enumerated.	Total amounts.	
			$20,283.80		$208.80		$20,492.60	
			257,476.77		201.20	$4,628.71	262,306.68	
				$132.30		182.60	314.30	
			277,760.57	132.30	410.00	4,810.71	283,113.58	
								$21.10
								21.10
$140.00		$140.00						105.75
								340.00
216.00		216.00						
1,963.66		1,963.66						
2,319.66		2,319.66						445.75
22,990.00	$27.00	23,017.00						
			2,314.30				2,314.30	
								166.56
251.50		251.50						
23,241.50	27.00	23,268.50	2,314.30				2,314.30	166.56

C, SUPPLEMENTAL.—*Statement showing in detail the amounts expended from*

General depots, independent posts, etc., and departments.	BARRACKS AND QUARTERS.						
	Hire of quarters for officers and enlisted men.	Hire of storehouses.	Hire of stables and grounds.	Advertising.	Construction and repairs.	All expenses not otherwise enumerated.	Total amount.
Department of Dakota.							
St. Paul, Minn					$260.68		$260.68
Helena, Mont							
Fort Snelling, Minn							
Fort Custer, Mont					552.76		552.76
Fort Keogh, Mont							
Fort Yates, N. Dak							
Fort Pembina, N. Dak							
Fort Assiniboine, Mont							
Fort Meade, S. Dak					1,299.03		1,299.03
Total					2,112.47		2,112.47
Department of Texas.							
San Antonio, Tex	$12.00		$10.00		2,268.00		2,290.00
Fort Ringgold, Tex	15.00						15.00
Fort Bliss, Tex							
Fort Clark, Tex							
Total	27.00		10.00		2,268.00		2,305.00
Department of California.							
San Francisco, Cal							
Presidio of San Francisco, Cal				$9.80			9.80
Angel Island, Cal							
Total				9.80			9.80
Department of Arizona.							
Los Angeles, Cal				73.91		$5.50	79.41
Fort Marcy, N. Mex					1,417.00		1,417.00
Fort Grant, Ariz							
Fort Bayard, N. Mex							
Fort Apache, Ariz					2,873.24		2,873.24
Fort Stanton, N. Mex					171.50		171.50
Fort Wingate, N. Mex							
San Carlos, Ariz							
Total				73.91	4,461.74	5.50	4,541.15
Department of the Columbia.							
Vancouver Barracks, Wash							
Portland, Oregon					137.74		137.74
Fort Spokane, Wash					5,000.00		5,000.00
Boise Barracks, Idaho					2,056.00		2,056.00
Total					7,193.74		7,193.74

the various appropriations from the Quartermaster's Department, etc.—Continued.

HOSPITALS.			CLOTHING AND CAMP EQUIPAGE.					Hospital stewards' quarters—construction and repairs, etc., of.
Construction and repairs.	Advertising.	Total amounts.	Purchase of material.	Manufacture.	Advertising.	All expenses not otherwise enumerated.	Total amounts.	
$22.00	.....	$22.00	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
22.00	.....	22.00	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
26.00	.....	26.00	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
26.00	.....	26.00	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	$9.50	9.50	.....	.....	.....	.....	.....	$9.50
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	9.50	9.50	.....	.....	.....	.....	.....	9.50
.....	.....	.....	.....	.....	.....	.....	.....	12.00
.....	.....	.....	.....	.....	.....	.....	.....	.....
71.51	.....	71.51	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	28.50
500.00	.....	500.00	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
571.51	.....	571.51	.....	.....	.....	.....	.....	40.50
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	20.70
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	20.70

C, SUPPLEMENTAL.—*Statement showing in detail the amounts expended from*

RECAPITULATION.

General depots, independent posts, etc., and departments.	Regular supplies.	Incidental expenses.	Cavalry and artillery horses.
General depots	$27,633.33	$19,227.03	$14,376.10
Independent posts, etc	27,398.47		
Department of the East	5,350.66	43.08	
Department of the Missouri	54,251.76	825.25	2,553.84
Department of the Platte	14,031.73	97.50	3,849.50
Department of Dakota	31,616.21	826.78	12,744.68
Department of Texas	9,359.08	206.98	
Department of California		.83	1,913.70
Department of Arizona	23,556.10	699.07	
Department of the Columbia	692.87	189.40	4.37
Total	193,890.21	22,115.92	35,442.38

the various appropriations from the Quartermaster's Department, etc.—Continued.

RECAPITULATION.

Transportation of the Army.	Shooting galleries and ranges.	Barracks and quarters.	Hospitals.	Hospital stewards' quarters.	Clothing and equipage.	Total.
$82,491.39	.....	$3,060.00	.....	.....	$283,113.52	$429,901.37
117,084.63	.....	57,251.90	.....	$21.10	.....	201 756.10
29,963.12	$49.15	37,226.17	$2,319.66	445.75	.....	75,397.59
134,882.42	82.31	9,253.63	23,268.50	166.66	2,314.30	227,598.67
116,351.81	.....	3,763.00	22.00	.....	.....	138,115.63
74,239.71	.....	2.112.47	26.00	.....	.....	121,566.05
16,869.55	1.13	2,305.00	.....	.....	.....	28,741.74
3,051.31	.....	9.80	9.50	9.50	.....	4,994.64
11,508.82	.....	4,541.15	571.51	40.50	.....	40,917.15
1,132.50	.....	7,193.74	.....	20.70	.....	9,233.48
587,575.26	132.59	126,716.86	26,217.17	704.21	285,427.82	1,278,222.42

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the general depots, independent posts, and departments of the Army, on what duty employed, their grade and monthly pay, and the appropriation from which paid, as shown by the latest reports received from officers serving in the Quartermaster's Department.*

GENERAL DEPOTS, AS PROVIDED BY ARMY REGULATIONS 1065.

Posts.	Regular supplies.								Incidental expenses.				
	Coal-heaver, $60.	Engineer, $100.	Engineer, $50.	Fireman, $70.	Forage-master, $70.	Foreman, $75.	Packers, $65.	Storekeeper, $100	Clerks, $150.	Clerks, $133.33.	Clerks, $116.66.	Clerks, $100.	Clerks, $83.33.
New York, N. Y.	1	....	....	1	....	....	3	1	3	2	4	2	....
Philadelphia, Pa	....	....	....	....	....	....	....	....	4	....	1	1	3
Washington, D. C	....	....	....	....	1	1	....	....	5	3	....	1	....
Jeffersonville, Ind	....	1	1	....	....	....	....	....	1	3	1	1	1
San Francisco, Cal	....	....	....	....	....	....	....	....	2	2	1	1	....
St. Louis, Mo	....	....	....	....	....	....	....	....	4	....	....	....	2
Total	1	1	1	1	1	1	3	1	19	13	7	6	6

Posts.	Incidental expenses.												
	Copyists, $75.	Copyists, $60.	Elevator-man, $70.	Elevator-man, $50.	Gardener, $50.	Janitor, $75.	Laborers, $60.	Laborers, $50.	Laborers, $45.	Laborer, $10.	Messengers, $75.	Messenger, $65.	Messengers, $60.
New York, N. Y.	1	....	1	1	....	....	1	....	....	....	....	....	2
Philadelphia, Pa	2	....	....	....	....	....	1	....	....	....	2	....	1
Washington, D. C	1	....	....	....	....	....	....	3	1	1	....	1	....
Jeffersonville, Ind	....	2	....	....	1	....	....	....	....	....	....	....	1
San Francisco, Cal	....	....	....	....	....	1	....	....	....	....	1	....	....
St. Louis, Mo	....	....	....	....	....	....	....	....	1	....	....	....	....
Total	4	2	1	1	1	1	2	3	2	1	3	1	4

Posts.	Incidental expenses.												
	Messengers, $45.	Messenger, $40.	Messenger and janitor, $70.	Scrubbers, $30.	Storekeeper, $133.33.	Storekeeper, $116.66.	Storekeeper, $83.33.	Superintendent, $150.	Telephone operator, $75.	Watchmen, $75.	Watchmen, $60.	Watchman, $52.50.	Watchmen, $50.	Watchman, $45.	Watchmen, $40.
New York, N. Y	....	....	....	2	....	....	....	....	....	2	1	....	....	....	....
Philadelphia, Pa	....	....	1	....	....	....	....	....	....	....	....	....	2	....	....
Washington, D. C	....	1	....	....	....	1	....	....	....	....	....	....	....	1	5
Jeffersonville, Ind	....	....	....	....	1	....	....	....	1	....	1	....	....	....	....
San Francisco, Cal	....	....	....	....	....	....	1	1	....	....	....	1	....	....	....
St. Louis, Mo	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	2	1	1	2	1	1	1	1	1	2	2	1	2	1	5

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

GENERAL DEPOTS, AS PROVIDED BY ARMY REGULATIONS 1065—Continued.

Posts.	Cavalry and artillery horses; inspector, $150.	Barracks and quarters; carpenters, $95.	Army transportation.										
			Carpenter, $90.	Carpenter, $75.	Carpenters, $70.	Carpenters, $65.	Carpenter, $60.	Drayman, $70.	Engineer, $100.	Engineer, $75.	Fireman, $50.	Hostler, $60.	Hostlers, $45.
New York, N. Y	.....	1	1	.....	.....	.....	.....	1	1	.....	.....	1	.....
Philadelphia, Pa	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Washington, D. C	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
Jeffersonville, Ind	.....	.....	.....	.....	1	1	1	.....	.....	1	1	.....	.....
San Francisco, Cal	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, Mo	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Total	1	2	1	1	2	2	2	1	1	1	1	1	5

Posts.	Army transportation.												
	Hostlers, $40.	Laborers, $54.	Laborer, $45.50.	Marker, $65.	Marker, $40.	Master baler, $75.	Messenger, $60.	Packers, $75.	Packer, $70.	Packers, $60.	Packers, $54.	Packers, $45.50.	Packers, $40.
Philadelphia, Pa	.....	13	.....	1	.....	1	.....	.....	.....	7	11	.....	.....
Washington, D. C	7	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....
Jeffersonville, Ind	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	19
San Francisco, Cal	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....
St. Louis, Mo	.....	.....	1	.....	.....	.....	.....	1	.....	1	.....	5	.....
Total	7	13	1	1	1	1	1	4	1	8	11	5	19

Posts.	Army transportation												
	Packers, assistant foreman of, $65.	Packer, chief, $100.	Packers, foreman of, $80.	Packers, foreman of, $70.	Packers, foreman of, $50.	Packer, master, $83.33.	Painter, $80.	Saddler, $75.	Shipper, $133.33.	Shipper, $116.66.	Shipper, $100.	Stable master, 65.
Philadelphia, Pa	.....	.....	.....	.....	.....	1	.....	.....	1	1	1	1
Jeffersonville, Ind	1	.....	1	1	1	.....	1	1	.....	.....	.....	.....
St. Louis, Mo	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	1	1	1	1	1	1	1	1	1	1	1	1

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

GENERAL DEPOTS, AS PROVIDED BY ARMY REGULATIONS 1065—Continued.

Posts.	Army transportation.												
	Storekeeper, $100.	Storekeeper's assistant, $50.	Superintendent, $133.33.	Superintendent, $85.	Superintendent, $70.	Teamster, $70.	Teamster, $65.	Teamsters, $60.	Teamster, $55.	Teamster, $54.	Teamster, $50.	Teamsters, $45.	Teamsters, $40.
New York, N. Y.				1	1							1	
Philadelphia, Pa								2		1			
Washington, D. C			1						1		1	6	
Jeffersonville, Ind	1	1										1	
San Francisco, Cal						1	1						
St. Louis, Mo												2	
Total	1	1	1	1	1	1	1	2	1	1	1	10	5

Posts.	Army transportation.						Clothing and equipage.						
	Transportation agents, $133.33.	Transportation agents, $116.66.	Transportation agent, $100.	Warehouseman, $45.	Watchmen, $50.	Weighmaster, $50.	Assistant foreman of cutters, $95.	Carpenter, $75.	Chief cutter, $100.	Clerks, $150.	Clerks, $133.33.	Clerks, $116.66.	Clerks, $100.
New York, N. Y.	1												
Philadelphia, Pa							1				1	2	
Washington, D. C					2								
Jeffersonville, Ind		1		1		1				1		2	
San Francisco, Cal	1		1					1	1	1	1		
St. Louis, Mo	1	2										1	2
Total	3	3	1	1	2	1	1	1	1	2	2	5	4

Posts.	Clothing and equipage.												
	Clerks, $83.33.	Copyist, $83.33.	Copyists, $75.	Engineer, $100.	Fireman, $60.	Folder, $40.	Folders, $35.	Foreman of cutters, $125.	Inspectors, $150.	Inspector, $133.33.	Inspector, $125.	Inspectors, $100.	Inspector, $83.33.
Philadelphia, Pa.		1	1	1	1			1	1		1	2	
Jeffersonville, Ind.	1		1			1			1				1
San Francisco, Cal	1						3			1		1	
Total	2	1	2	1	1	1	3	1	2	1	1	3	1

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

GENERAL DEPOTS, AS PROVIDED BY ARMY REGULATIONS 1065—Continued.

Posts.	Clothing and equipage.												
	Inspector, $75.	Laborers, $54.	Laborer, $40.	Packer, $90.	Packers, $70.	Packers, $60.	Trimmer, $75.	Trimmers, $60.	Warehousemen, $1.33.33.	Watchman, $85.	Watchmen, $70.	Watchmen, $60.	Watchman, $52.50.
Philadelphia, Pa	....	14	1	....	....	.....	1	1	1	1	3	2	....
Jeffersonville, Ind	....	....	....	....	....	.....	.....	1	.....	.....	.....	.....	....
San Francisco, Cal	....	....	....	1	5	7	.....	.....	1	.....	.....	.....	....
St. Louis, Mo	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	1
Total	....	14	1	1	5	7	1	2	2	1	3	2	1

INDEPENDENT POSTS, RECRUITING DEPOTS, ARSENALS, ETC.

Posts.	Regular supplies.				Incidental expenses.									
	Engineer, $75.	Fireman, $35.	Forage master, $75.	Foreman, $100.	Clerk, $150.	Clerks, $133.33.	Clerks, $116.66.	Clerk, $25.	Copyist, $50.	Engineer, $45.	Farrier, $120; on temporary duty at World's Fair, Chicago.	Laborer, $40.	Messenger, $60.	Watchman, $35.
Springfield Armory, Mass	....	....	....	....	....	....	....	1	....	....	.....	....	....	....
West Point, N. Y	....	....	....	....	....	1	1	....	....	....	.....	....	....	....
Hot Springs, Ark	....	....	....	....	....	....	....	....	....	....	.....	1	1	....
Columbus Barracks, Ohio	1	1	....	....	....	1	1	....	....	1	.....	....	....	....
Davids Island, N. Y	....	....	....	....	....	1	....	....	....	....	.....	....	....	....
Jefferson Barracks, Mo	....	....	....	....	....	1	....	....	1	....	1	....	....	....
Fort Snelling Ordnance Depot, Minn	....	....	....	....	....	....	....	....	....	....	.....	....	....	1
Military Prison, Fort Leavenworth, Kans	....	....	1	1	1	....	....	....	....	....	.....	....	....	....
Total	1	1	1	1	1	4	2	1	1	1	1	1	1	1

Posts.	Army transportation.							Steamlaunch Hamilton.				Clothing and equipage.	
	Engineer, $80.	Engineer, $75.	Foreman of transportation, $100.	Plumber, $75.	Teamster, $40.	Teamster, $35.	Transportation agent, $83.33.	Deck hand, $50.	Engineer, $80.	Fireman, $50.	Master, $100.	Inspector, $116.66.	Instructor, $100.
Hot Springs, Ark	....	....	.....	....	1	....	.....	.....	....	....	.....	.....	....
Davids Island, N. Y	1	....	.....	....	....	....	.....	1	1	1	1	.....	....
Jefferson Barracks, Mo	....	1	.....	1	....	....	.....	.....	....	....	.....	.....	....
Frankford Arsenal, Pa	....	....	.....	....	....	....	1	.....	....	....	.....	.....	....
Fort Snelling Ordnance Depot, Minn	....	....	.....	....	....	1	.....	.....	....	....	.....	.....	....
Military Prison, Fort Leavenworth, Kans	....	....	1	....	....	....	.....	.....	....	....	.....	1	1
Total	1	1	1	1	1	1	1	1	1	1	1	1	1

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF THE EAST.

Posts.	Regular supplies.		Incidental expenses.										
	Firemen, $40.	Forage-master, $75.	Clerks, $150.	Clerks, $133.33.	Clerk, $116.66.	Clerks, $100.	Interpreter, $100.	Janitor, $45.	Janitor, $30.	Laborer, $45.	Laborer, $30.	Messenger, $75.	Messenger, $60.
Headquarters, Governors Island, N. Y	.....	.....	4	5	1	.....	.....	1	1	1	1	1	.....
Baltimore, Md	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo, N. Y	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	1
Fort Monroe, Va	.....	1	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....
New Orleans, La	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Boston, Mass	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Mount Vernon Barracks, Ala	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Fort McPherson (and Atlanta), Ga	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Fort Thomas, Ky	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Madison Barracks (and Sacketts Harbor, N. Y.)	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Barrancas, Fla	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	2	1	10	9	1	5	1	1	1	1	1	1	1

Posts.	Incidental expenses.					Barracks and quarters.			Army transportation.					
	Messengers, $50.	Messengers, $45.	Messenger, $40.	Messengers, $25.	Storekeeper, 38.	Carpenters, $60.	Painter, $60.	Draftsman, $150.	Blacksmiths, $60.	Blacksmith, $35.	Engineer, $100.	Engineer, $90.	Engineers, $80.	Engineers, $75.
Headquarters, Governors Island, N. Y	1	.....	.....	1	.....	2	1	1	1	1	.....	.....	.....	.....
Baltimore, Md	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Monroe, Va	.....	1	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	1
New Orleans, La	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston, Mass	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort McPherson (and Atlanta), Ga	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jackson Barracks, La	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Washington, D. C	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Fort Hamilton, N. Y	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1
Fort Thomas, Ky	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
Madison Barracks (and Sacketts Harbor), N. Y	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plattsburg, N. Y	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fort Barrancas, Fla	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	5	3	1	2	1	2	1	1	2	1	1	1	2	3

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF THE EAST—Continued.

Posts.	Army transportation.													
	Engineer, $70.	Engineers, $60.	Engineer, $55.	Engineer, $45.	Engineer, $40.	Firemen, $40.	Laborer, $40.	Mason, $60.	Mason's helper, $35.	Plumbers, $80.	Plumber, $75.	Plumbers, $60.	Plumber's helper, $35.	Superintendent of transportation, $116.66.
Headquarters Governors Island, N. Y.	....	....	....	1	....	....	....	1	1	....	....	1	1	1
Fort Monroe, Va.	....	1	....	....	....	....	1	....	....	1	....	....	....	....
Mount Vernon Barracks, Ala.	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Fort McPherson and (Atlanta, Ga.)	....	....	....	....	1	....	....	....	....	1	....	....	....	....
Fort Niagara, N. Y.	....	1	....	....	....	....	....	....	....	....	....	1	....	....
Fort Schuyler, N. Y.	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Fort Myer, Va.	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Fort Preble, Me.	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Fort Thomas, Ky.	....	....	....	....	....	....	....	....	....	....	1	....	....	....
Madison Barracks (and Sackett's Harbor), N. Y.	....	....	1	....	....	2	....	....	....	....	....	....	....	....
Total	1	5	1	1	1	2	1	1	1	2	1	2	1	1

Posts.	Army transportation.													
	Teamsters, $30.	Wharfinger, $85.	Wheelwright, $50.	Launch Monroe.		Steamer Atlantic.					Steamer Resolute.			
				Engineer, $75.	Pilot, $70.	Deck hands, $45.	Engineers, $75.	Firemen, $55.	Master, $110.	Pilot, $110.	Deck hands, $40.	Engineer, $70.	Fireman, $50.	Master, $110.
Headquarters, Governors Island, N. Y.	3	....	....	....	....	4	2	2	1	1	....	....	....	....
Fort Monroe, Va.	....	1	1	....	....	....	....	....	....	....	....	....	....	....
New Orleans, La.	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Boston, Mass.	....	....	....	....	....	....	....	....	....	....	2	1	1	1
Washington, D. C.	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Fort Adams, R. I.	....	....	....	1	1	....	....	....	....	....	....	....	....	....
Total	5	1	1	1	1	4	2	2	1	1	2	1	1	1

DEPARTMENT OF THE MISSOURI.

Posts.	Regular supplies.									Incidental expenses.					
	Engineers, $100.	Engineers, $80.	Engineers, $60.	Fireman, $60.	Firemen, $40.	Forage-masters, $75.	Forage-master, $55.	Tinner, $45.	Wood-rangers, $40.	Clerks, $150.	Clerks, $133.33.	Clerks, $116.66.	Clerks, $100.	Farrier, $150.	Farriers, $60.
Headquarters, Chicago, Ill.	....	....	....	....	....	....	....	....	....	3	6	5	2	1	....
Fort Leavenworth, Kans.	....	1	1	....	....	....	....	1	1	....	1	....	1	....	1
Fort Sheridan, Ill.	1	1	....	1	....	....	....	....	....	2	....	....	1	....	....
Fort Reno, Okla.	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Fort Sill, Okla.	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1
Fort Riley, Kans.	1	1	1	....	4	1	....	....	1	1	....	....	....	....	....
Fort Brady (and Sault de Ste. Marie), Mich.	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....
Total	2	3	2	1	4	3	1	1	2	7	7	5	4	1	2

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF THE MISSOURI—Continued.

Posts.	Incidental expenses.												Army transportation.		
	Guide, $100.	Interpreters, $100.	Janitor, $45.	Laborers, $50.	Messengers, $60.	Messengers, $40.	Messenger, $25.	Scrubbers, $45.	Storekeeper, $75.	Veterinary surgeon, $125.	Watchman, $50.	Watchmen, $40.	Blacksmiths, $60.	Cartmen, $30.	Corral-master, $60.
Headquarters, Chicago, Ill	....	....	....	....	2	....	....	2	....	....	1	1	....	....	....
Fort Leavenworth, Kans	....	....	1	....	....	....	....	....	1	1	....	1	....	1	1
Fort Sheridan, Ill	....	....	....	2	....	....	1	....	....	....	....	....	....	....	....
Fort Reno, Okla	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort Supply, Ind. T	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort Sill, Okla	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort Riley, Kans	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....
Fort Brady (and Sault de Ste. Marie), Mich.	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....
Total	1	2	1	2	2	2	1	2	1	1	1	2	5	1	1

Posts.	Army transportation.													
	Engineers, $100.	Engineers, $80.	Engineer, $70.	Engineers, $60.	Farrier, $60.	Fireman, $40.	Firemen, $30.	Foreman of stables, $65.	Hostlers, $52.	Packer, $40.	Plumber, $83.33.	Plumbers, $80.	Plumber, $75.	Plumber's helper, $30.
Headquarters Chicago, Ill	....	....	....	....	....	....	....	1	2	....	....	....	....	....
Fort Leavenworth, Kans	....	1	....	1	1	....	1	....	....	1	....	1	....	1
Fort Sheridan, Ill	1	1	....	....	....	....	....	....	....	....	1	....	....	....
Fort Reno, Okla	....	....	....	1	....	....	....	....	....	....	....	....	1	....
Fort Supply, Ind. T	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Fort Sill, Okla	....	....	....	1	....	....	....	....	....	....	....	....	....	....
Fort Riley, Kans	1	....	....	1	....	1	1	....	....	....	....	1	....	....
Fort Brady (and Sault de Ste. Marie), Mich	....	....	1	1	....	....	....	....	....	....	....	....	....	....
Total	2	2	1	6	1	1	2	1	2	1	1	2	1	1

Posts.	Army transportation.												
	Scavenger, $30.	Superintendent, $75.	Teamsters, $52.	Teamsters, $40.	Teamsters, $30.	Trainmasters, $60.	Transportation agent, $150.	Transportation agent, $100.	Transportation agents, $83.33	Transportation agent, $60.	Wagon-masters, $60.	Warehouseman, $40.	Wheelwrights, $60.
Headquarters, Chicago, Ill	....	....	4	....	....	....	1	....	1	....	....	....	....
Fort Leavenworth, Kans	....	....	....	....	10	....	....	1	....	1	....	1	....
Fort Sheridan, Ill	....	....	....	1	1	....	....	....	....	....	....	....	....
Fort Reno, Okla	....	....	....	....	9	....	....	....	....	....	1	....	1
Fort Supply, Ind. T	....	....	....	....	5	1	....	....	....	....	....	....	1
Fort Sill, Okla	1	....	....	....	7	1	....	....	....	....	....	....	1
Fort Riley, Kans	....	1	....	....	14	....	....	....	1	....	1	....	....
Fort Brady (and Sault de Ste. Marie), Mich	....	....	....	1	....	....	....	....	....	....	....	....	....
Total	1	1	4	2	46	2	1	1	2	1	2	1	3

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF THE PLATTE.

Posts.	Regular supplies.				Incidental expenses.									
	Agent, $100.	Forage-master, $100.	Forage-masters, $75.	Laborers, $35.	Clerks, $150.	Clerks, $133.33.	Clerks, $116.66.	Clerk, $100.	Copyist, $60.	Draftsman, $133.33.	Guide, $150.	Guide, $100.	Interpreter, $75.	Interpreter, $60.
Headquarters and De pot, Omaha Nebr	1	1	1	6	4	6	2	1	1	1	....	....	....	....
Fort McKinney, Wyo	....	....	....	....	....	....	....	....	....	....	1	....	....	....
Fort Robinson, Nebr	....	....	1	....	....	....	....	....	....	....	....	1	....	....
Fort Washakie, Wyo	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Fort Duchesne, Utah	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Denver, Colo	....	....	....	....	1	....	....	....	....	....	....	....	....	....
Total	1	1	2	6	5	6	2	1	1	1	1	1	1	1

Posts.	Incidental expenses.									Army transportation.			
	Laborer, $40.	Messenger, $75.	Messenger, $60.	Messenger, $50.	Porters, $50.	Storekeeper, $100.	Watchman, $50.	Watchman, $45.	Watchman, $35.	Blacksmith, $75.	Blacksmiths, $60.	Cargadores, $60.	Corral-master, $60.
Headquarters and Depot, Omaha, Nebr	1	1	1	1	1	1	1	1	1	1	....	....	....
Fort McKinney, Wyo	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort Robinson, Nebr	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort Washakie, Wyo	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort Duchesne, Utah	....	....	....	....	....	....	....	....	....	....	1	....	....
Denver, Colo	....	....	....	....	1	....	....	....	....	....	....	....	....
Fort Logan, Colo	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort Niobrara, Nebr	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort D. A. Russell, Wyo	....	....	....	....	....	....	....	....	....	....	1	2	1
Fort Douglas, Utah	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort Sidney, Nebr	....	....	....	....	....	....	....	....	....	....	1	....	....
Total	1	1	1	1	2	1	1	1	1	1	9	2	1

Posts.	Army transportation.												
	Engineer, $100.	Engineer, $83.33.	Engineer, $75.	Engineers, $60.	Hostler, $40.	Packers, $60.	Packers, $30.	Packers, $40.	Packer, $35.	Packer, chief, $133.33.	Pack-masters, $100.	Plumbers, $60.	Teamster, $50.
Headquarters and Depot, Omaha, Nebr	....	....	1	1	1	1	....	2	1	....	....	....	1
Fort McKinney, Wyo	....	....	....	1	....	....	1	....	....	....	....	1	....
Fort Robinson, Nebr	....	....	....	1	....	....	....	....	....	....	....	1	....
Fort Washakie, Wyo	....	....	....	1	....	....	....	....	....	....	....	....	....
Fort Duchesne, Utah	....	....	....	....	....	1	....	....	....	....	....	....	....
Fort Logan, Colo	1	....	....	....	....	....	....	....	....	....	....	1	....
Fort Omaha, Nebr	....	1	....	....	....	....	....	....	....	....	....	....	....
Fort Niobrara, Nebr	....	....	....	1	....	....	1	....	....	....	....	1	....
Fort D. A. Russell, Wyo	....	....	....	1	....	....	7	....	....	1	2	....	....
Fort Sidney, Nebr	....	....	....	1	....	....	....	....	....	....	....	....	....
Total	1	1	1	7	1	2	9	2	1	1	2	4	1

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF THE PLATTE—Continued.

Posts.	Army transportation.												
	Teamsters, $45.	Teamsters, $40.	Teamsters, $30.	Transportation agents, $133.33.	Transportation agents, $116.66.	Transportation agents, $100.	Transportation agent, $83.33.	Transportation agent, $75.	Transportation agents, $60.	Transportation agent, $30.	Wheelwrights, $75.	Wheelwrights, $70.	Wheelwrights, $60.
Headquarters and Depot, Omaha, Nebr	2	4	....	1	1	3	1	1	2	1	....	2	....
Fort McKinney, Wyo	....	....	2	....	....	....	....	....	....	....	1	....	1
Fort Robinson, Nebr	....	....	2	....	....	....	....	....	....	....	....	....	1
Fort Washakie, Wyo	....	....	1	....	....	....	....	....	....	....	....	....	1
Fort Duchesne, Utah	....	....	1	....	....	....	....	....	....	....	....	....	1
Denver, Colo	....	1	....	1	1	....	....	....	....	....	....	....	....
Fort Logan, Colo	....	....	5	....	....	....	....	....	....	....	....	....	....
Fort Omaha, Nebr	....	....	1	....	....	....	....	....	....	....	....	....	....
Fort Niobrara, Nebr	....	....	2	....	....	....	....	....	....	....	....	....	1
Fort D. A. Russell, Wyo	....	....	1	....	....	....	....	....	....	....	....	....	1
Fort Douglas, Utah	....	....	1	....	....	....	....	....	....	....	....	....	1
Fort Sidney, Nebr	....	....	1	....	....	....	....	....	....	....	....	....	1
Total	2	5	17	2	2	3	1	1	2	1	1	2	8

DEPARTMENT OF DAKOTA.

Posts.	Regular supplies.				Incidental expenses.										
	Engineer, $100.	Engineer, $75.	Fireman, $45.	Forage-masters, $75.	Clerks, $150.	Clerks, $133.33.	Clerks, $116.66.	Clerks, $100.	Guide, $133.33.	Interpreters, $75.	Interpreters, $60.	Janitor, $60.	Messengers, $50.	Scout, $75.	Scrubber, $35.
Headquarters, St. Paul, Minn	1	....	1	....	3	2	2	4	....	....	....	1	2	....	1
Fort Snelling, Minn	....	1	....	1	....	....	....	1	....	....	....	....	....	....	....
Helena, Mont	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....
Fort Custer, Mont	....	....	....	1	....	....	....	1	1	....	1	....	....	....	....
Fort Buford, N. Dak	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
Fort Assinaboine, Mont	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....
Fort Keogh, Mont	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....
Fort Meade, S. Dak	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Fort Yates, N. Dak	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....
Fort Yellowstone, Wyo	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Total	1	1	1	4	4	2	2	6	1	2	3	1	3	1	1

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF DAKOTA—Continued.

Posts.	Barracks and quarters.				Army transportation.							
	Carpenter, $60.	Engineer, $83.33.	Painter, $85.	Sawyer, $60.	Blacksmiths, $83.33.	Blacksmiths, $80.	Blacksmith, $75.	Blacksmiths, $60.	Elevator-man, $40.	Engineer, $116.66.	Engineers, $100.	Engineers, $83.33.	Engineer, $55.
Headquarters, St. Paul, Minn									1				
Fort Snelling, Minn			1					1		1			1
Fort Custer, Mont	1	1		1	1								
Fort Buford, N. Dak						1							
Fort Assinaboine, Mont						1					1		
Fort Keogh, Mont					1							1	
Fort Meade, S. Dak								1			1		
Fort Missoula, Mont					1							1	
Fort Yates, N. Dak								1			1		
Fort Sully, S. Dak								1				1	
Fort Yellowstone, Wyo						1							
Camp Poplar River, Mont							1						
Fort Pembina, N. Dak												1	
Total	1	1	1	1	3	3	1	4	1	1	3	4	1

Posts.	Army transportation.											
	Foreman, $60.	Hostlers, $40.	Laborer, $40.	Packers, $60.	Packers, $50.	Saddlers, $60.	Scavengers, $60.	Scavenger, $30.	Superintendent, $100.	Teamsters, $45.	Teamsters, $40.	Teamsters, $35.
Headquarters, St. Paul, Minn	1	2	1		1					2		
Fort Snelling, Minn												7
Helena, Mont										1		
Fort Custer, Mont					1	1	1					11
Fort Buford, N. Dak							1		1			4
Fort Assinaboine, Mont						1	1				6	
Fort Keogh, Mont				1		1						
Fort Missoula, Mont							1				5	
Fort Yates, N. Dak							1					
Fort Sully, S. Dak								1				
Fort Yellowstone, Wyo				1								4
Camp Poplar River, Mont												2
Fort Pembina, N. Dak												2
Total	1	2	1	2	2	3	5	1	1	3	11	30

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF DAKOTA—Continued.

Posts.	Army transportation.											
	Teamsters, $30.	Train-master, $75.	Train-master, $60.	Transportation agents, 133.33.	Transportation agent, $116.66.	Transportation agents, $100.	Transportation agent, $83.33.	Transportation agents, $75.	Transportation agent, $40.	Wheelwrights, $83.33.	Wheelwright, $75.	Wheelwrights, $60.
Headquarters, St. Paul, Minn	----	----	----	3	1	1	1	2	1	----	----	----
Fort Snelling, Minn	----	----	----	----	----	----	----	----	----	----	----	1
Fort Custer, Mont	----	1	----	----	----	1	----	----	----	1	----	----
Fort Buford, N. Dak	----	----	----	----	----	----	----	----	----	----	1	----
Fort Assinaboine, Mont	----	----	----	----	----	----	----	----	----	----	----	1
Fort Keogh, Mont	7	----	----	----	----	----	----	----	----	1	----	----
Fort Meade, S. Dak	10	----	1	----	----	----	----	----	----	----	----	1
Fort Yates, N. Dak	7	----	----	----	----	----	----	----	----	1	----	----
Fort Sully, S. Dak	3	----	----	----	----	----	----	----	----	----	----	----
Total	27	1	1	3	1	2	1	2	1	3	1	3

DEPARTMENT OF TEXAS.

Posts.	Regular supplies.						Incidental expenses.							
	Engineer, $85.	Fireman, $35.	Forage-master, $60.	Lamp-lighter, $30.	Watchmen, $40.	Wood-sawyer, $30.	Clerk, $150.	Clerks, $133.33.	Clerks, $116.66.	Laborers, $30.	Mail-carrier, $45.	Messenger, $45.	Storekeeper, $100.	Watchmen, $40.
Headquarters, San Antonio, Tex.	1	1	1	1	3	1	1	1	2	4	1	1	1	2
Fort Bliss (and El Paso, Tex)	----	----	----	----	----	----	----	1	----	----	----	----	----	----
Total	1	1	1	1	3	1	1	2	2	4	1	1	1	2

Posts.	Army transportation.													
	Blacksmith, $72.	Blacksmith, $66.	Blacksmiths, $60.	Blacksmith's helper, $40.	Corral-master, $60.	Engineers, $60.	Engineer, $50.	Fireman, $40.	Foreman, $60.	Packers, $50.	Packer, $40.	Pack-masters, $100.	Painter, $60.	Painter, $30.
Headquarters San Antonio, Tex.	1	1	----	1	1	----	----	1	1	----	1	----	1	1
Fort Clark, Tex	----	----	----	----	----	1	----	----	----	----	----	----	----	----
Fort Bliss (and El Paso), Tex	----	----	1	----	----	----	----	----	----	----	----	----	----	----
Fort Ringgold, Tex	----	----	1	----	----	1	----	----	----	----	----	----	----	----
Fort McIntosh, Tex	----	----	1	----	----	1	----	----	----	5	----	2	----	----
Fort Brown, Tex	----	----	1	----	----	1	1	----	----	----	----	----	----	----
Fort Sam Houston, Tex	----	----	1	----	----	----	----	----	----	----	----	----	----	----
Total	1	1	5	1	1	4	1	1	1	5	1	2	1	1

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF TEXAS—Continued.

Posts.	Army transportation.												
	Plumber, $66.	Plumber, $60.	Teamster, $35.	Teamsters, $30.	Transportation agent, $133.33.	Transportation agent, $116.66.	Transportation agent, $83.33.	Transportation agent, $50.	Wagon-master, $60.	Wheelwright, $79.	Wheelwright, $72.	Wheelwrights, $60.	Wheelwright, $50.
Headquarters, San Antonio, Tex	1	....	....	6	1	1	1	1	.....	1	1	....	....
Fort Clark, Tex	....	....	....	....	.....	.....	.....	.....	.....	....	....	1	....
Fort Bliss (and El Paso), Tex	....	....	1	....	.....	.....	.....	.....	1	....	....	1	....
Fort Ringgold, Tex	....	....	....	....	.....	.....	.....	.....	.....	....	....	1	....
Fort Sam Houston, Tex	....	1	....	....	.....	.....	.....	.....	.....	....	....	....	1
Total	1	1	1	6	1	1	1	1	1	1	1	3	1

DEPARTMENT OF CALIFORNIA.

Posts.	Regular supplies.		Incidental expenses.									Army transportation.			
	Forage-master, $83.33.	Gardeners, $50.	Clerk, $150.	Clerks, $133.33.	Clerks, $116.66.	Draftsman, $150.	Inspector of animals, $133.33.	Janitor, $85.	Laborer, $75.	Messenger, $50.	Watchman, $65.	Blacksmith, $80.	Blacksmith's helper, $60.	Engineer, $100.	Engineer, $60.
Headquarters, San Francisco, Cal	1	1	1	1	2	1	1	1	1	1	1	....	....	....	....
Presidio of San Francisco, Cal	....	....	....	1	....	....	.....	.....	.....	.....	.....	1	1	1	....
Fort Mason, Cal	....	1	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....
Angel Island, Cal	....	....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	1
Total	1	2	1	2	2	1	1	1	1	1	1	1	1	1	1

Posts.	Army transportation.													
							Steamer McDowell.							
	Herder, $50.	Plumbers, $80.	Plumber, $60.	Teamsters, $65.	Teamsters, $50.	Train master, $75.	Watchman, $15.	Assistant engineer, $90.	Captain, $133.33.	Deck hand, $75.	Engineer, $125.	Firemen, $80.	Mate, $80.	Seamen, $70.	Watchman, $70.
Headquarters, San Francisco, Cal	....	....	....	3	....	....	....	1	1	1	1	2	1	4	1
Presidio of San Francisco, Cal	1	1	....	....	4	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Alcatraz Island, Cal	....	....	1	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....
Benicia Barracks, Cal	....	1	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....
Total	1	2	1	3	4	1	1	1	1	1	1	2	1	4	1

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF ARIZONA.

Posts.	Regular supplies.	Incidental expenses.						Army transportation.							
	Forage-masters, $60.	Clerks, $150.	Clerks, $133.33.	Clerks, $116.66.	Interpreters, $75.	Janitor, $60.	Messengers, $60.	Blacksmiths, $80.	Blacksmiths, $60.	Engineer, $100.	Engineer, $90.	Engineer, $85.	Engineers, $80.	Engineers, $75.	Laborers, $50.
Headquarters, Los Angeles, Cal		2	3	4		1	2								2
Whipple Barracks, Ariz								1		1					
San Carlos, Ariz	1				1			1						1	
Fort Apache, Ariz	1				1			1			1				
Fort Bowie, Ariz								1					1		
Fort Huachuca, Ariz	1							1					1		
Fort Grant, Ariz	1							1							
Fort Wingate, N. Mex	1				1				1					1	
Fort Bayard, N. Mex	1								1			1		1	
Fort Stanton, N. Mex	1								1						
Total	7	2	3	4	3	1	2	6	3	1	1	1	2	3	2

Posts.	Army transportation.												
	Pack-master, $133.33.	Plumber, $75.	Saddler, $75.	Saddler, $60.	Saddler, $50.	Teamster, $60.	Teamsters, $50.	Teamsters, $40.	Teamsters, $35.	Teamsters, $30.	Transportation agents, $100.	Transportation agents, $50.	Wheelwrights, $80.	Wheelwrights, $60.
Headquarters, Los Angeles, Cal	1					1	2				2	3		
San Carlos, Ariz					1			3						
Fort Apache, Ariz			1					2					1	
Fort Bowie, Ariz								2					1	
Fort Huachuca, Ariz								2					1	
Fort Grant, Ariz				1				6					1	
Fort Wingate, N. Mex		1								3				1
Fort Bayard, N. Mex										2				1
Fort Stanton, N. Mex										2				1
Fort Marcy, N. Mex									1					
San Diego Barracks, Cal								1						
Total	1	1	1	1	1	1	2	16	1	7	2	3	4	3

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc.*—Continued.

DEPARTMENT OF THE COLUMBIA.

Posts.	Regular supplies.		Incidental expenses.							Barracks and quarters.	Army transportation.			
	Forage-master, $60.	Forage-masters, $40.	Clerks, $150.	Clerk, $133.33.	Clerks, $116.66.	Clerk, $100.	Laborer, $40.	Messengers, $60.	Superintendent, $60.	Carpenter, $80.	Blacksmiths, $80.	Blacksmiths, $75.	Blacksmith, $60.	Blacksmith, $50.
Headquarters, Vancouver Barracks, Wash	1	6	2	1	1	1	1	1	1	1	1	....	....	1
Portland, Oregon	....	....	1	....	1	....	....	1	....	....	....	....	....	....
Fort Spokane, Wash	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Fort Wallawalla, Wash	....	....	....	....	....	....	....	....	....	....	1	....	....	....
Fort Sherman, Idaho	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Boise Barracks, Idaho	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Total	1	6	3	1	2	1	1	2	1	1	2	2	1	1

Posts.	Army transportation.												
	Engineer, $100.	Engineers, $80.	Engineers, $75.	Fireman, $45.	Hostler, $40.	Packers, $60.	Stable-masters, $60.	Teamsters, $40.	Transportation agents, $133.33.	Transportation agent, $83.33.	Warehouseman, $83.33.	Watchman, $60.	Wheelwright, $80.
Headquarters, Vancouver Barracks, Wash	1	1	....	1	1	....	1	7	1	.....	1	1	1
Portland, Oregon	....	....	....	....	....	....	.....	.....	1	.....	.....	....	....
Fort Spokane, Wash	....	....	1	....	....	....	.....	2	.....	.....	.....	....	....
Fort Wallawalla, Wash	....	....	....	....	....	1	.....	4	.....	1	.....	....	....
Fort Sherman, Idaho	....	....	1	....	....	1	.....	2	.....	.....	.....	....	....
Fort Townsend, Wash	....	1	....	....	....	....	.....	.....	.....	.....	.....	....	....
Boise Barracks, Idaho	....	....	....	....	....	....	.....	2	.....	.....	.....	....	....
Fort Canby, Wash	....	....	1	....	....	....	.....	.....	.....	.....	.....	....	....
Total	1	2	3	1	1	2	1	17	2	1	1	1	1

RECAPITULATION.

From what appropriation paid.	Number of employés.	Monthly pay.	Yearly pay.
General depots:			
Regular supplies	9	$720.00	$8,640.00
Incidental expenses	101	9,580.80	114,969.60
Cavalry and artillery horses	1	150.00	1,800.00
Barracks and quarters	2	190.00	2,280.00
Army transportation	140	8,319.65	99,835.80
Clothing and equipage	77	6,149.27	73,791.24
Total	330	25,109.72	301,316.64
Independent posts:			
Regular supplies	4	285.00	3,420.00
Incidental expenses	14	1,291.64	15,499.68
Army transportation	11	593.33	7,119.96
Clothing and equipage	2	216.66	2,599.92
Total	31	2,386.63	28,639.56

D.—*Statement showing the number of civilians employed by the month and paid by the Quartermaster's Department in the departments, etc*—Continued.

RECAPITULATION—Continued.

From what appropriation paid.	Number of employes.	Monthly pay.	Yearly pay.
Department of the East:			
Regular supplies	3	$155.00	$1,860.00
Incidental expenses	44	4,214.66	50,575.92
Barracks and quarters	4	330.00	3,960.00
Army transportation	55	3,361.66	40,339.92
Total	106	8,061.32	96,735.84
Department of the Missouri:			
Regular supplies	19	1,185.00	14,220.00
Incidental expenses	44	4,326.63	51,919.56
Army transportation	98	4,606.99	55,283.88
Total	161	10,118.62	121,423.44
Department of the Platte:			
Regular supplies	10	560.00	6,720.00
Incidental expenses	30	3,016.66	36,199.92
Army transportation	93	5,424.98	65,099.76
Total	133	9,001.64	108,019.68
Department of Dakota:			
Regular supplies	7	520.00	6,240.00
Incidental expenses	26	2,483.32	29,799.84
Barracks and quarters	4	288.33	3,459.96
Army transportation	129	6,644.98	79,739.76
Total	166	9,936.63	119,239.56
Department of Texas:			
Regular supplies	8	360.00	4,320.00
Incidental expenses	14	1,039.99	12,479.88
Army transportation	46	2,673.32	32,079.84
Total	68	4,073.31	48,879.72
Department of California:			
Regular supplies	3	183.33	2,199.96
Incidental expenses	11	1,188.32	14,259.84
Army transportation	29	2,068.33	24,819.96
Total	43	3,439.98	41,279.76
Department of Arizona:			
Regular supplies	7	420.00	5,040.00
Incidental expenses	15	1,571.64	18,859.68
Army transportation	63	3,708.33	44,499.96
Total	85	5,699.97	68,399.64
Department of the Columbia:			
Regular supplies	7	300.00	3,600.00
Incidental expenses	11	1,136.66	13,639.92
Barracks and quarters	1	80.00	960.00
Army transportation	40	2,423.32	29,079.84
Total	59	3,939.98	47,279.76
Total amount by appropriation:			
Regular supplies	77	4,688.33	56,259.96
Incidental expenses	310	29,850.32	358,203.84
Cavalry and artillery horses	1	150.00	1,800.00
Barracks and quarters	10	888.33	10,659.96
Army transportation	704	39,824.89	477,898.68
Clothing and equipage	79	6,365.93	76,391.16
Total	1,181	81,767.80	981,213.60

E.—*Statement showing the amounts expended by officers of the Quartermaster's Department during and on account of the appropriations for the fiscal year 1893, and balances in their hands so far as shown by accounts received at this office.*

Names of officers.	Expenditures.	Balances.
Atwood, E. B., major and quartermaster	$38,521.80	$28,379.07
Arnold, I., jr., major, Ordnance Department	498.58	.....
Adams, G., lieutenant, Fifth Artillery	20,349.99	831.42
Ayer, W. E., lieutenant, Eleventh Infantry	7,299.45	.....
Andrus, F. B., lieutenant, Fourth Infantry	1,007.64	.....
Allen, H. T., lieutenant, Second Cavalry	362.40	100.80
Aleshire, J. B., lieutenant, First Cavalry	6,171.14	537.53
Bingham, J. D., colonel and assistant quartermaster-general	13,440.86	2,496.11
Barnett, C. R., captain and assistant quartermaster	35,755.75	1,773.34
Bird, C., captain and assistant quartermaster	89,145.61	2,589.25
Booth, C. A., captain and assistant quartermaster	57,272.20	1,445.34
Barrett, A., captain and military storekeeper, Quartermaster's Department	243,832.57	57,332.58
Butler, J. G., major Ordnance Department	973.59	.....
Bethel, W. A., lieutenant, Fourth Artillery	292.80	.....
Baldwin, W. H., lieutenant, Seventh Cavalry	5,227.52	225.57
Rennett, C. A., lieutenant, Third Artillery	454.64	.....
Bailey, C. J., lieutenant, First Artillery	9,909.06	364.50
Brooks, E. H., lieutenant, Twenty-first Infantry	7,961.79	1,272.14
Buck, W. L., lieutenant, Thirteenth Infantry	4,466.56	.....
Benjamin, E. E., lieutenant, First Infantry	4,464.62	59.12
Browne, E. H., lieutenant, Fourth Infantry	7,823.21	54.31
Brown, E. T., lieutenant, Fifth Artillery	55.50	.....
Brainard, D. L., lieutenant, Second Cavalry	575.68	.....
Batchelor, J. B., jr., lieutenant, Twenty-fourth Infantry	2,837.25	.....
Brooke, W., lieutenant, Fourth Infantry	418.67	.....
Burgess, L. R., lieutenant, Fifth Artillery	2,271.67	.....
Benét, J. W., lieutenant, Ordnance Department	2,494.61	71.42
Bingham, T. A., captain, Engineer Corps	638.00	232.39
Brown, R. A., lieutenant, Fourth Cavalry	3,683.94	797.44
Buttler, W. C., lieutenant, Third Infantry	1,760.86	220.60
Brant, L. P., lieutenant, First Infantry	268.55	17.06
Buffington, A. P., lieutenant, Thirteenth Infantry	944.92	157.01
Chandler, J. G., colonel and assistant quartermaster-general	144,186.34	16,320.82
Clem, J. L., captain and assistant quartermaster	67,936.96	6,346.54
Croxton, R. C., lieutenant, Fifth Infantry	8,183.12	.....
Crawford, M., lieutenant, Second Artillery	5,028.60	240.98
Cummins, A. S., lieutenant, Fourth Artillery	1,548.35	.....
Cowles, W. H., lieutenant, Sixteenth Infantry	13,860.30	.....
Cronin, M. D., lieutenant, Twentieth Infantry	1,860.15	.....
Crabbs, J. T., lieutenant, Eighth Cavalry	12,706.66	134.06
Carleton, G., lieutenant, Second Cavalry	14,351.14	731.07
Cabell, H. C., lieutenant, Fourth Infantry	6,507.49	235.67
Clark, W. O., lieutenant, Twelfth Infantry	2,823.83	.....
Califf, J. M., lieutenant, Third Artillery	4,055.59	382.18
Cabell, Dr. R. C., lieutenant, Eighth Cavalry	10,107.00	.....
Coates, E. M., major, Nineteenth Infantry	871.43	267.46
Cartwright, G. S., lieutenant, Twenty-fourth Infantry	5,841.17	406.41
Cornish, L. W., lieutenant, Fifth Cavalry	4,878.67	.....
Clark, C. C., lieutenant, Ninth Infantry	440.03	.....
Cronkhite, A., lieutenant, Fourth Artillery	388.31	31.49
Dandy, G. B., lieutenant-colonel and deputy quartermaster-general	172,501.74	53,705.64
Dunn, B. W., lieutenant, Ordnance Department	1,633.32	.....
Dodds, F. L., lieutenant, Ninth Infantry	4,744.53	65.93
Daniel, L., lieutenant, Sixth Cavalry	3,309.78	.....
Davison, L. P., lieutenant, Eleventh Infantry	9,187.64	61.32
Dodd, G. A., captain, Third Cavalry	394.75	.....
Druien, J. L., lieutenant, Seventeenth Infantry	13,100.15	.....
Eltonhead, F. E., captain, Twenty-first Infantry	1,022.21	.....
Edwards, E. A., lieutenant, Twenty-fifth Infantry	1,745.96	.....
Evans, E. W., lieutenant, Eighth Cavalry	4,731.07	.....
Emery, J. A., lieutenant, Eleventh Infantry	6,938.22	22.55
Evans, R. K., lieutenant, Twelfth Infantry	347.51	244.87
Furey, J. V., major and quartermaster	281,553.16	94,780.11
Forsyth, L. C., major and quartermaster	18,301.16	2,050.68
Floyd, D. H., captain and assistant quartermaster	68,625.15	2,141.71
Foote, S. M., lieutenant, Fourth Artillery	6,125.61	.....
Foster, F. W., lieutenant, Fifth Cavalry	23,615.86	.....
Frederick, D. A., lieutenant, Seventh Infantry	1,836.45	.....
Farnsworth, C. S., lieutenant, Twenty-fifth Infantry	8,488.72	11.30
Ferris, F. O., lieutenant, First Infantry	5,894.73	.....
Febiger, L., lieutenant, Twenty-third Infantry	45,870.42	.....
Frazier, J., lieutenant, Nineteenth Infantry	1,364.93	.....
Finley, J. P., lieutenant, Ninth Infantry	474.45	354.00
Gilliss, J., major and quartermaster	79,745.60	43,232.20
Geary, W., lieutenant, Nineteenth Infantry	1,403.53	14.80
Greene, L. D., lieutenant, Seventh Infantry	9,815.59	.....
Getty, R. N., lieutenant, Twenty-second Infantry	13,412.93	1,092.80
Gerlach, W., captain, Third Infantry	2,385.17	.....
Gatley, G. G., lieutenant, Fifth Artillery	3,931.12	.....

E.—*Statement showing the amounts expended by officers of the Quartermaster's Department during the fiscal year 1893, etc.*—Continued.

Names of officers.	Expenditures.	Balances.
Galbraith, W. W., lieutenant, Fifth Artillery	$2,129.85	
Glenn, E. F., lieutenant, Twenty-fifth Infantry	6,879.90	[illegible]
Glasgow, W. J., lieutenant, First Cavalry	74.40	
Greer, J. E., captain, Ordnance Department	472.49	63.42
Gibson, W. W., lieutenant, Ordnance Department	1,586.76	311.97
Glassford, W. A., lieutenant, Signal Corps	221.67	
George, C. P., lieutenant, Sixteenth Infantry	6,639.85	1,955.67
Hughes, W. B., lieutenant-colonel, and deputy quartermaster-general	200,281.55	6,426.26
Humphrey, C. F., major and quartermaster	132,818.04	17,521.73
Hathaway, F. H., captain and assistant quartermaster	153,628.65	7,122.38
Hoyt, G. S., captain and assistant quartermaster	18,534.54	13,519.87
Hyde, J. McE., captain and assistant quartermaster	43,772.42	9,846.52
Howard, G., captain and assistant quartermaster	2,188.45	517.78
Horn, T. N., lieutenant, Second Artillery	4,253.78	166.75
Hobbs, C. W., lieutenant, Third Artillery	11,644.03	2,495.54
Hine, C. DeL., lieutenant, Sixth Infantry	1,762.06	
Hatch, E. E., lieutenant, Eighteenth Infantry	5,684.55	
Hay, W. H., lieutenant, Third Cavalry	1,210.88	
Hornbrook, J. J., lieutenant, Second Cavalry	1,902.83	
Hovey, H. W., lieutenant, Twenty-fourth Infantry	8,856.08	5.00
Hart, W. H., lieutenant, Fourth Cavalry	4,484.11	23.56
Hancock, W. F., lieutenant, Fifth Artillery	2,430.85	
Hardman, L., lieutenant, Fourth Cavalry	4,364.38	
Hein, O. L., lieutenant, First Cavalry	338.00	30.00
Hall, C. S., lieutenant, Thirteenth Infantry	2,474.32	2,011.60
Humphrey, H. D., lieutenant, Twentieth Infantry	948.59	37.77
Haan, W. G., lieutenant, Fifth Artillery	2,582.42	10.24
Hunter, C. H., lieutenant, First Artillery	1,232.94	
Hines, J. L., lieutenant, Second Infantry	23.95	
Haden, J. J., lieutenant, Eighth Infantry	3,853.81	65.31
Howard, H. P., lieutenant Sixth Cavalry		500.10
Ingalls, C. H., captain and assistant quartermaster	90,212.04	624.82
Irons, J. A., lieutenant, Twentieth Infantry	10,127.91	188.09
Jacobs, J. W., captain and assistant quartermaster	186,674.23	9,076.12
Jones, F. B., captain and assistant quartermaster	97,413.56	42,215.71
Jones, S. R., captain and assistant quartermaster	112,303.37	3,447.16
Jervey, H., lieutenant, Engineer Corps	14,149.54	
Johnson, W. O., lieutenant, Nineteenth Infantry	4,225.48	172.30
Johnson, F. O., lieutenant, Third Cavalry	2,449.75	
Jones, W. K., lieutenant Fourteenth Infantry	218.75	
Jones, E. N., jr., lieutenant, Eighth Infantry	5,007.10	
Jadwin, E., lieutenant, Engineer Corps	7,483.08	445.57
Jackson, W. P., lieutenant, Twenty-fourth Infantry	767.86	201.35
Kirk, E. B., major and quartermaster	32,371.53	1,582.32
Kimball, A. S., major and quartermaster	97,811.18	
Kreps, J. F., lieutenant, Twenty-second Infantry	4,074.37	135.41
Kimball, W. A., lieutenant, Fourteenth Infantry	2,940.50	
Knight, J. T., lieutenant, Third Cavalry	10,807.17	
Lee, J. G. C., lieutenant-colonel and deputy quartermaster-general	66,880.77	11,803.01
Lord, J. H., major and quartermaster	146,586.17	
Ladd, E. F., lieutenant, Ninth Cavalry	17,242.99	274.78
Lissak, O. M., lieutenant, Ordnance Department	2,483.54	28.75
Lockett, J., lieutenant, Fourth Cavalry	1,568.61	
Lyon, Le R. S., lieutenant, Second Artillery	2,650.55	
Lindsley, E., lieutenant, Sixth Cavalry	1,329.62	
Loveridge, E. L, lieutenant, Eleventh Infantry	397.85	
Liggett, H., lieutenant, Fifth Infantry	150.52	42.59
Moore, J. M., lieutenant-colonel and deputy quartermaster-general	228,051.95	13,740.56
McGounigle, A. J., major and quartermaster	23,826.41	
Marshall, J. M., major and quartermaster	7,393.01	128.43
McCauley, C. A. H., captain and assistant quartermaster	85,813.24	
Miller, W. H., captain and assistant quartermaster	42,200.61	6,716.71
Martin, M. C., captain and assistant quartermaster	92,260.39	10,667.14
Morgan, A. S. M., captain, Ordnance Department	884.09	12.92
Morrison, C. C., captain, Ordnance Department	158.16	
McGinness, J. R., major, Ordnance Department	1,346.50	
Miller, S. W., lieutenant Fifth Infantry	3,391.80	
McFarland, M., lieutenant, Twenty-first Infantry	5,887.86	
Mercer, W. A., lieutenant, Eighth Infantry	3,762.31	
McDonald, J. B., lieutenant, Tenth Cavalry	18,832.79	198.99
McClure, N. F., lieutenant, Fourth Cavalry	1,748.36	
Mills, A. L., lieutenant, First Cavalry	5,344.98	
Mason, C. W., captain, Fourth Infantry	5,603.24	
Mitchell, J., lieutenant, Fourteenth Infantry	1,653.89	
McQuiston, C., lieutenant, Fourth Infantry	573.29	
Normoyle, J. E., lieutenant, Twenty-third Infantry	3,269.35	
Ostheim, L., lieutenant, Second Artillery	1,135.80	
O'Brien, J. J., captain, Fourth Infantry	1,068.17	
Perry, A. J., colonel and assistant quartermaster-general	38,329.62	
Pond, G. E., captain and assistant quartermaster	53,753.48	916.89
Pullman, J. W., captain and assistant quartermaster	44,839.14	405.43
Pope, J. W., captain and assistant quartermaster	24,733.55	6,929.10

E.—*Statement showing the amounts expended by officers of the Quartermaster's Department during the fiscal year 1893, etc.*—Continued.

Names of officers.	Expenditures.	Balances.
Pitman, J., captain, Ordnance Department	$597.56	
Patterson, R. H., lieutenant, First Artillery	8,246.53	$98.22
Palmer, A. M., lieutenant, Twenty-fourth Infantry	11,437.60	
Post, J. C., major, Engineer Corps	296.73	61.08
Peterson, M. R., lieutenant, Tenth Infantry	1,922.00	
Perry, A. W., lieutenant, Ninth Cavalry	110.60	103.40
Robinson, A. G., lieutenant-colonel and deputy quartermaster-general	9,012.10	408.88
Rockwell, A. F., major and quartermaster	222,429.96	2,223.70
Ruhlen, G., captain and assistant quartermaster	165,096.35	3,159.03
Robinson, W. W., captain and assistant quartermaster	67,095.70	
Rexford, W. H., major, Ordnance Department	2,480.74	
Rockwell, J., jr., captain, Ordnance Department	2,715.39	300.96
Reed, H. A., lieutenant, Second Artillery	4,450.01	290.50
Roberts, H. L., lieutenant, Nineteenth Infantry	8,751.61	1,490.60
Roach, G. H., captain, Seventeenth Infantry	12,834.41	
Ripley, H. L., lieutenant, Third Cavalry	819.30	
Rivers, T. R., lieutenant, Third Cavalry	943.09	
Ryan, J. P., lieutenant, Third Cavalry	2,249.05	97.35
Rumbough, D. J., lieutenant, Third Artillery	4,791.92	
Royden, H. N., lieutenant, Twenty-third Infantry	70.30	
Sawtelle, C. G., lieutenant-colonel and deputy quartermaster general	789,526.43	60,818.60
Sculley, J. W., major and quartermaster	53,752.04	7,192.40
Smith, G. C., major and quartermaster	204,233.62	13,704.70
Simpson, J., major and quartermaster	40,045.10	2,029.87
Summerhayes, J. W., captain and assistant quartermaster	32,776.28	5,561.85
Stevens, R. R., lieutenant, Sixth Infantry	10,859.10	638.45
Stone, W. P., lieutenant, Fourth Artillery	7,720.81	
Smith, O. M., captain, Subsistence Department	46,314.59	3,251.61
Simpson, W. L., lieutenant, Ninth Infantry	1,445.82	
Stiles, D. F., captain, Tenth Infantry	103.45	
Scott, A. B., lieutenant, Thirteenth Infantry	11,273.72	
Stotsenburg, J. M., lieutenant, Sixth Cavalry	16,113.46	662.30
Shollenberger, J. H., lieutenant, Tenth Infantry	4,454.70	6.59
Seybum, J. R., lieutenant, Twenty-fourth Infantry	668.66	
Stottler, V. E., lieutenant, Tenth Infantry	11,704.31	210.55
Sargent, H. H., lieutenant, Second Cavalry	5,741.00	112.05
Seay, S., jr., lieutenant, Twenty-first Infantry	625.05	
Shuttleworth, E. A., lieutenant, Eleventh Infantry	20,263.70	386.46
Steele, C. L., lieutenant, Eighteenth Infantry	377.86	
Sydenham, A. H., lieutenant, Fifth Artillery	2,109.16	
Stamper, W. Y., lieutenant, Twenty-first Infantry	4,087.19	
Schwan, T., major and assistant adjutant-general	180.00	
Stevens, R. R., lieutenant, Twenty-third Infantry	1,088.95	
Schoeffel, F. H., lieutenant, Ninth Infantry	1,115.30	
Tompkins, C. H., colonel and assistant quartermaster-general	70,312.82	23,383.04
True, T. E., captain and assistant quartermaster	354,138.43	27,552.28
Thompson, C. D., captain and assistant quartermaster	71,974.78	13,966.69
Turner, R. R., lieutenant, Sixth Infantry	42,913.80	6,363.63
Thompson, J. T., lieutenant, Ordnance Department	4,370.36	
Taylor, C. W., captain, Ninth Cavalry	238.60	
Torrey, Z. W., lieutenant, Sixth Infantry	12,843.83	4,421.80
Tillson, J. C. F., lieutenant, Fifth Infantry	6,953.68	866.57
Truitt, C. M., lieutenant, Twenty-first Infantry	6,506.67	200.00
Townsley, C. P., lieutenant, Fourth Artillery	6,351.69	1,966.74
Todd, H. D., jr., lieutenant, Third Artillery	27,570.36	173.38
Varney, A. L., major, Ordnance Department	344.02	
Weeks, G. H., lieutenant-colonel and deputy quartermaster-general	324,610.40	52,003.19
Williams, C. W., major and quartermaster	42,587.30	2,772.78
Wheeler, D. D., captain and assistant quartermaster	61,540.96	20,675.96
Whittemore, J. M., colonel, Ordnance Department	136.08	
Walsh, R. D., lieutenant, Fourth Cavalry	4,679.02	
Weaver, E. M., lieutenant, Second Artillery	14,812.76	4,188.75
Webster, F. D., lieutenant, Sixth Infantry	1,825.92	
Wittenmyer, E., lieutenant, Ninth Infantry	2,245.91	
Walker, E. S., lieutenant, Eighth Infantry	20,148.87	
Wilkins, H. E., lieutenant, Second Infantry	116.65	
Webster, E. K., lieutenant, Second Infantry	10,689.80	1,189.57
Waltz, M. F., lieutenant, Twelfth Infantry	6,085.34	239.41
Williams, A., captain, Third Infantry	21,474.46	
White, G. P., lieutenant, Third Cavalry	1,906.42	
Wood, W. T., lieutenant, Eighteenth Infantry	20,654.05	
Winn, J. S., lieutenant, Second Cavalry	611.48	
Wilhelm, W. H., lieutenant, Tenth Infantry	6,943.30	58.05
West, B. K., lieutenant, Sixth Cavalry	891.61	
Wallace, R. B., lieutenant, Second Cavalry	534.74	2,615.26
Winn, F. L., lieutenant, First Infantry	867.35	
Waring, J. K., captain, Second Infantry	1,790.06	
Witherell, C. T., captain, Nineteenth Infantry	65.20	
Woodward, C. G., lieutenant, Third Artillery	515.12	
Young, C., lieutenant, Ninth Cavalry	7,391.55	
Total	6,860,198.25	760,222.78

4.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., July 5, 1893.

GENERAL: I have the honor to submit the following report of the clothing and equipage returns branch of this office for the fiscal year ended June 30, 1893.

In this branch returns of clothing and equipage are registered and examined and the necessary correspondence relative thereto is conducted.

After the examination and correction of errors, the returns are forwarded to the Second Auditor of the Treasury for settlement.

Eight clerks were employed during part of the year, seven are now on duty.

The accompanying tabular statement shows the amount of work done during the year, viz:

Returns on hand June 30, 1892	1,433
Returns received during fiscal year	3,598
Total	5,031
Returns examined during fiscal year	4,224
Returns on hand June 30, 1893	807
Letters written	6,905
Transfers and sales verified	31,560
Auditor's settlements registered	4,493
Replies to remarks examined	1,267

Respectfully submitted.

M. I. LUDINGTON,
Deputy Quartermaster-General, U. S. Army.

The QUARTERMASTER-GENERAL, U. S. ARMY.

5.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
July 19, 1893.

SIR: I have the honor to submit the following report, pertaining to the operations of the clothing and equipage supply branch of this office, for the fiscal year ending June 30, 1893.

GENERAL DUTIES.

This branch of the office conducts the business pertaining to the purchase, manufacture, and issue of clothing and equipage to the Army and to the militia of the States and Territories under existing laws and regulations.

Receipts and expenditures.

The sum appropriated by Congress for the purchase and manufacture of clothing and equipage was	$1,200,000.00
There was credited to the appropriation on account of issues to the militia of the States and Territories, under the act of Congress amending Section 1661 of the Revised Statutes, the sum of	215,150.19

The sum placed to the credit of the appropriation from sales to officers and surveying expeditions authorized by law, collections by pay department on account of clothing overdrawn, and purchases of discharges by soldiers under section 4, act of Congress approved June 16, 1890, and other miscellaneous sources, amounted to	$110,611.63
Making a total of	1,525,761.82
The remittances to officers of the Quartermaster's Department at the several purchasing and manufacturing depots, and to the Fort Leavenworth Military Prison and elsewhere, for the purchase, manufacture, and repair of clothing and equipage, amounted to the sum of	1,301,285.23
Leaving a balance of	224,476.59

in the Treasury of the United States on the 30th ultimo, all of which, together with future credits from collections by the pay department, as also the sum of $4,579.13, due on account of issues to the militia, will be required to pay obligations under contracts entered into prior to the close of the last fiscal year.

The following is a detailed statement showing the remittances on account of clothing and equipage referred to, viz:

Department of the East	$533.25
Department of the Missouri	122.58
Department of Texas	106.50
Department of the Platte	117.00
Department of Dakota	1,116.80
Department of California	78.00
Department of the Columbia	8.00
Philadelphia, Pa., depot	1,026,455.38
Jeffersonville, Ind., depot	97,137.33
St. Louis, Mo., depot	5,847.99
San Francisco, Cal., depot	157,612.94
West Point, N. Y	5.00
Jefferson Barracks, Mo	12.25
Willets Point, N. Y. H	10.00
Fort Leavenworth military prison	12,122.21
Total	1,301,285.23

PURCHASES AND MANUFACTURES.

There were manufactured at the several general depots of the Quartermaster's Department during the fiscal year the following articles of clothing and equipage from materials purchased under contract:

At Philadelphia, Pa.:	
Dress coats, all kinds	3,789
Overcoats, Kerseys, made and unmade	9,194
Blouses, made and unmade	41,562
Canvas fatigue coats	5,348
Trousers, kersey, for footmen, made and unmade	36,787
Trousers, kersey, for mounted men, made and unmade	16,670
Canvas fatigue trousers	9,477
Overalls	5,422
Stable frocks	1,202
Dark-blue flannel shirts	3,863
Drawers	16,945
Tents, conical wall	526
Tents, hospital	156
Tents, wall	551
Tents, common	565
Tents, shelter	7,301
At Jeffersonville, Ind.:	
Blouses, made and unmade	15,000
Canvas fatigue coats	8,000
Canvas fatigue trousers	8,000
Stable frocks	560
Drawers	26,990
Dark-blue flannel shirts	6,000

At San Francisco, Cal.:	
Dress coats, all kinds	1,295
Overcoats, kersey, made and unmade	1,362
Blouses, made and unmade	7,473
Canvas fatigue coats	1,213
Trousers, kersey, for footmen, made and unmade	9,284
Trousers, kersey, for mounted men, made and unmade	3,662
Stable frocks	467
Dark-blue flannel shirts	3,005
Drawers	9,548

There were manufactured at the Fort Leavenworth military prison, from materials purchased by this department, the articles of clothing and equipage specified in the following statement, which also gives the cost of the same in detail, viz:

Articles.	Number.	Material.	Prison labor.	Civilian labor.	Royalty.	Total.
Shoes, campaign, partly machine-sewed bottoms ..... pairs..	14,508	$21,980.51	$2,732.37	$750.06	$477.91	$25,941.85
Shoes, calfskin, sewed, ... do.....	13,760	20,871.18	4,031.25	348.26	34.54	25,285.23
Corn brooms.....	21,644	3,006.89	522.50	.....	.....	3,529.39
Total.....	.....	45,858.58	7,287.12	1,098.32	512.45	54,756.47

Such of the scrap leather as could not be utilized at the Fort Leavenworth military prison in the manufacture of shoes during the last fiscal year, has been sold after inviting proposals, and the sum of $258.39 derived from this source. This amount has been covered into the Treasury and credited to "Miscellaneous receipts."

There were turned over to the Fort Leavenworth military prison during the last fiscal year the following articles of clothing, equipage and stores, for which this Department will not be reimbursed, but considered as a partial offset for the labor performed by the prison for the Quartermaster's Department:

Articles.	Number.	Price.	Amount.
Shoes:			
Campaign ..... pairs.	681	$1.89	$1,287.09
Post..... do...	4	2.70	10.80
Boots, cavalry ..... do...	1	.....	3.23
Corn brooms.....	1,188	.16	190.08
Total clothing and equipage.....	.....	.....	1,491.19
Stores:			
Wagon tongues.....	24	.....	65.35
Saddle cart	1	.....	4.35
Saddletree	1	.....	1.39
Cart lines..... pairs..	1	.....	1.00
Collars, ambulance harness	15	1.45	21.75
Breast straps	2	.54	1.08
Total	.....	.....	1,586.11

There were also manufactured at the Fort Leavenworth military prison during the last fiscal year, and furnished to the Alcatraz, Cal., military prison, at the expense of the appropriation for clothing and equipage, the following articles of clothing required for issue to military convicts, viz:

Articles.	Number.	Material.	Labor.	Total.
Blouses	50	$82.09	$25.00	$107.09
Trousers, pairs	320	372.57	160.00	532.57
Shirts	450	542.53	45.00	587.53
Total	.....	997.19	230.00	1,227.19

PURCHASES.

The following are the quantities of the principal articles of clothing, equipage and materials, purchased by the Quartermaster's Department, during the last fiscal year:

Helmets, untrimmed	11,464	Woven-wire bunk bottoms, extra	1,248
Helmets, cork	14,860	Mosquito bars	4,973
Forage caps	42,842	Axes	2,600
Fur caps	7,501	Shovels	500
Fur gauntlets, pairs	12,723	Scrubbing brushes	15,005
Leggings, pairs	18,521	Cloth, dark blue, all kinds, yards	28,088
Undershirts, all kinds	37,600	Kersey, sky blue, all kinds, yards	168,110
Muslin shirts	47,037	Dark-blue blouse flannel, yards	181,825
Woolen stockings, pairs	62,320	Shirting flannel, yards	6,004
Cotton stockings, pairs	160,648	Blouse-lining flannel, yards	125,845
Berlin gloves, pairs	162,100	Canton flannel, yards	35,019
Leather gauntlets, pairs	6,522	Cotton duck, yards	390,285
Shoes, pairs	49,827	Duck for canvas fatigue clothing, yards	73,785
Arctic overshoes, pairs	8,651	Leather, counter, pounds	8,175
Blankets, woolen	18,513	Leather, sole, pounds	66,405
Mattresses	1,000	Leather, welt, pounds	4,595
Pillows	1,000	Leather, wax upper, pounds	13,298
Bed sheets	490	Leather, calfskin, pounds	35,041
Pillowcases	24,014		
Iron bedsteads with woven-wire bottoms	1,135		

ISSUES TO THE ARMY.

The quantity of each article of clothing and equipage issued to the Army will be ascertained from the detailed statement accompanying this report.

ISSUES TO THE MILITIA.

The following is a detailed statement showing the value of clothing, equipage, and regular supplies issued by the Quartermaster's Department during the last fiscal year to the several States and Territories under the act of Congress amending section 1661 of the Revised Statutes, for which the respective appropriations have been reimbursed

from the annual appropriation made by Congress for that purpose, viz:

States.	Clothing and equipage.	Regular supplies.	Total.
Alabama	$4,001.48	.....	$4,001.48
Arizona	2,450.78	.....	2,450.78
Arkansas	4,288.97	.....	4,288.97
Connecticut	6,105.82	.....	6,105.82
Delaware	1,437.10	.....	1,437.10
District of Columbia	4,549.57	$148.72	4,698.29
Florida	1,948.48	.....	1,948.48
Idaho	1,244.53	.....	1,244.53
Illinois	15,605.83	.....	15,605.83
Indiana	5,899.13	.....	5,899.13
Iowa	1,890.90	.....	1,890.90
Kansas	3,159.25	.....	3,159.25
Kentucky	6,157.48	.....	6,157.48
Louisiana	7,167.97	.70	7,168.67
Maine	1,889.72	.....	1,889.72
Maryland	2,042.11	.....	2,042.11
Massachusetts	8,202.80	.....	8,202.80
Michigan	6,578.22	.....	6,578.22
Minnesota	5,547.60	.....	5,547.60
Missouri	11,867.87	.....	11,867.87
Montana	3,669.04	.....	3,669.04
Nevada	1,060.52	.....	1,060.52
New Jersey	2,054.92	.....	2,054.92
New Hampshire	1,190.80	.....	1,190.80
New Mexico	62.25	.....	62.25
New York	43,432.89	.....	43,432.89
North Carolina	6,264.61	.....	6,264.61
North Dakota	969.14	.....	969.14
Ohio	7,364.90	.....	7,364.90
Pennsylvania	11,622.23	.....	11,622.23
South Carolina	6,510.51	.....	6,510.51
South Dakota	2,598.50	.....	2,598.50
Tennessee	8,069.49	.....	8,069.49
Texas	3,870.25	14.50	3,884.75
Vermont	3,682.98	.....	3,682.98
Virginia	4,915.57	.....	4,915.57
West Virginia	3,216.27	.....	3,216.27
Wisconsin	3,636.37	.....	3,636.37
Wyoming	3,503.37	.....	3,503.37
Grand total	219,729.32	163.92	219,893.24

There were also issued to the commanding general of the military of the District of Columbia, during the last fiscal year, under the act of Congress approved March 1, 1889, for which this Department will not be reimbursed:

Clothing and equipage, to the value of	$6,565.60
Regular supplies, to the value of	1,480.94
Total	8,046.54

ISSUES TO INDIAN PRISONERS OF WAR.

No appropriation for clothing the Indian prisoners of war (men, women, and children) confined at Mount Vernon Barracks, Alabama, having been made by Congress, there were issued by this Department during the last fiscal year, from the military supplies on hand or specially purchased for that purpose, articles to the value of $4,877.27.

This expense is a total loss to the appropriation for clothing and equipage.

COLLECTIONS BY PAY DEPARTMENT.

There were collected by the Pay Department during the last fiscal year, and placed to the credit of the appropriation for clothing and

equipage, on account of clothing overdrawn by the enlisted men in excess of their allowance, the sum of $74,766.25, and also the sum of $42,379.07, on account of purchases of discharges by soldiers under section 4, act of Congress approved June 16, 1890.

The amount paid to the enlisted men on account of clothing undrawn was $350.061.68.

These figures again demonstrate that the allowance of clothing fixed under existing regulations is amply sufficient.

TRANSFER OF TENTS TO MARINE HOSPITAL SERVICE.

By authority of the Secretary of War there were transferred on September 10, 1892, to the Supervising Surgeon-General of the Marine Hospital Service, for the cholera quarantine station at Sandy Hook, N. J., 400 tents, from those purchased for use of sufferers from the overflow of the Mississippi River, under special act of Congress approved March 31, 1890.

Orders were also given on the 6th of June last to transfer 200 tents to the Marine Hospital Service for the establishment of an emigrant detention camp on Fishermans Island. The cost of all of these tents was $4,920.

There were also sold to the Supervising Surgeon-General of the United States Marine Hospital Service, for quarantine purposes, 7 hospital tents, complete, at a total cost of $273.21.

SALE OF TROUSERS TO UNITED STATES SOLDIERS' HOME.

There were sold during the last fiscal year, under authority of the Secretary of War of August 25, 1892, to the governor of the United States Soldiers' Home, near this city, 800 pairs of trousers, of obsolete shade, at the prices fixed in General Orders, No. 52, Adjutant-General's Office, 1889, for like articles. The sum of $2,060.18 was realized from said sale and placed to the credit of the appropriation for clothing and equipage.

SALE OF PONCHOS TO NAVY DEPARTMENT.

With the approval of the Secretary of War, and upon the application of the Paymaster-General, U. S. Navy, there were sold to the Navy Department, during the last fiscal year, 150 rubber ponchos, at a cost of $232.50.

SALES OF TENTS TO GEOLOGICAL SURVEY.

There were sold to the director of the U. S. Geological Survey, under section 3692 of the Revised Statutes, 1 hospital and 13 wall tents, all complete, with flies, poles, and pins.

The value of these tents, amounting to $278.88, has been reimbursed to the appropriation for clothing and equipage.

SALES OF CONDEMNED AND OBSOLETE CLOTHING AND EQUIPAGE.

There was realized during the last fiscal year, at the general depots of the Quartermaster's Department and at the Fort Leavenworth military prison, from sales of cuttings and condemned and obsolete articles, the sum of $9,442.47, all of which has been covered into the Treasury of the United States, credited to "Miscellaneous receipts." The

expenses connected with said sales amounted to $115.69, which were paid from the appropriation for clothing and equipage.

BOOTS.

Preliminary steps have been taken to change the present style of Army boot for the enlisted men so soon as the present stock shall have become sufficiently reduced by issues.

It is the intention to substitute a lighter and more pliable upper for the wax upper leather heretofore used for that purpose, and at the same time make the legs of the boots lighter, thereby reducing the weight of the boots materially.

CALFSKIN SHOES.

During the last fiscal year a supply of new shoes has been procured and the issue of same will soon be commenced. The uppers of these shoes are made of calfskin, weighing from 55 to 60 pounds to the dozen skins. Another (narrower) last has been added, and the widths hereafter furnished will be four, known as AA, A, B, and C.

No efforts have been spared to produce a good and comfortable service shoe.

To guard against the breaking of the uppers from the soles, the shoes now being procured have side linings of calfskin, and in addition thereto the vamps are lined with 8-ounce canvas duck.

It is believed that these shoes will prove satisfactory, as those sent out for trial seem to have met with favor.

LEGGINGS FOR MOUNTED TROOPS.

There were purchased and issued during the last fiscal year 1,969 pairs of canvas leggings of extra lengths for use of cavalry troops stationed in Arizona and other posts in southern latitudes. From the favorable reports and comments of officers, it would seem that in some parts of the country, at least, canvas leggings worn with the regulation shoe constitute a more comfortable and satisfactory foot equipment for service in the field than the wax upper boot now supplied, and a stock of such leggings will hereafter be kept in depot for issue to the cavalry.

RUBBER CAPES.

The stock of rubber blankets and ponchos left over at the close of the war having become exhausted, the subject of procuring another supply of waterproof equipment has been under consideration for some time.

Samples of various kinds and qualities of articles adapted to the purpose were procured by special manufacture and their merits considered and compared.

A careful study of the whole subject has led to the conclusion that a rubber cape or talma will serve the purpose of both the blanket and poncho, and afford about as much protection as a rubber coat, without its disadvantages of weight, warmth, etc.

Steps have been taken to procure three hundred of these capes for distribution to the Army for trial. They will be of two lengths (38 and 40 inches), will button down in front in a concealed flap, and have high collars which, when raised, will fit closely to the neck.

CLERICAL WORK.

The clerical work of this branch of the office is promptly disposed of and kept up to date.

CONCLUSION.

For detailed information, showing the articles of clothing, equipage, and materials on hand at the issuing depots of the Quartermaster's Department on the 30th of June, 1892, the quantities purchashed, manufactured received from posts and depots, taken up, sold, transferred to general depots, expended, issued to the Army and the militia during the last fiscal year, and the quantities remaining in depots June 30, 1893, attention is invited to the statement accompanying this report.

Very respectfully,

M. I. LUDINGTON,
Deputy Quartermaster-General, U. S. Army.

The QUARTERMASTER-GENERAL, U. S. ARMY.

A.—*Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department June 30, 1892, the quantities purchased, manufactured, received from posts and depots, taken up, sold, transferred to general depots, expended, issued to the Army and the militia, and the quantities remaining in depots June, 30, 1893.*

Articles.	On hand June 30, 1892.	Purchased.	Manufactured.	Received from general depots.	Received from posts.	Gained.	Total received.	Sold.	Transferred to general depots.	Expended or dropped.	Issued to the militia.	Issued to the Army.	Total issued.	Remaining on hand June 30, 1893.
Helmets:														
Untrimmed	8,495	11,464	.....	7,359	159	.....	27,477	11	4,230	.....	1,204	6,826	12,271	15,206
Cork	7,205	14,860	.....	5,412	230	.....	27,707	276	3,705	.....	273	5,857	10,111	17,596
Hair plumes	6,845	2,300	.....	912	35	.....	10,092	35	912	.....	133	1,646	2,726	7,366
Cords and bands	5,784	2,660	.....	1,457	98	.....	9,939	3	1,457	.....	121	1,763	3,344	6,595
Top bases	7,140	8,000	.....	6,400	135	.....	21,675	1	6,400	.....	1,359	5,460	13,220	8,455
Plume sockets	5,731	3,000	.....	1,500	.....	.....	10,231	.....	1,500	.....	139	1,695	3,334	6,897
Spikes	6,678	2,500	.....	7,300	136	.....	16,614	1	4,800	.....	1,333	3,897	10,031	6,583
Eagles	13,894	588	.....	9,838	150	.....	24,470	28	5,400	.....	1,356	5,447	12,231	12,239
Scrolls and rings ..... pairs	18,208	.....	.....	3,300	56	.....	21,564	2	3,800	.....	242	3,025	7,069	14,495
Side buttons ..... do	32,929	18,000	.....	10,665	374	.....	61,968	11	11,880	.....	2,798	9,922	24,611	37,357
Numbers	106,078	40,664	.....	4,000	1,637	.....	146,379	2	4,000	.....	4,725	6,317	15,044	131,335
Devices	6,015	400	.....	100	83	.....	6,598	11	100	.....	12	1,267	1,390	5,208
Caps:														
Forage	29,917	42,842	.....	31,363	642	.....	104,764	176	25,579	.....	10,763	29,932	66,450	38,314
Fur	7,293	7,501	.....	7,549	90	.....	22,433	19	7,549	.....	.....	6,688	14,256	8,177
Canvas	8,461	.....	200	.....	445	.....	9,106	22	.....	.....	.....	2,024	2,046	7,060
Campaign hats	26,507	20,311	.....	17,524	381	4	64,727	64	15,148	.....	2,703	19,247	37,162	27,565
Cords and tassels	26,701	.....	.....	50	410	.....	27,161	62	50	.....	.....	1,012	1,124	26,034
Devices:														
Crossed cannon	6,139	1,800	.....	900	100	.....	8,939	.....	900	.....	566	1,343	2,809	6,130
Indian scouts	574	.....	.....	100	7	.....	681	.....	100	.....	.....	81	181	500
Crossed sabers	14,691	1,500	.....	4,500	55	.....	20,746	2	4,500	.....	140	5,130	9,772	10,974
Crossed rifles	19,811	13,000	.....	9,000	125	.....	41,936	7	9,000	.....	7,797	6,365	23,169	18,767
Castles	1,234	.....	.....	.....	.....	.....	1,234	3	.....	.....	.....	250	253	981
Shell and flame	2,102	.....	.....	.....	6	.....	2,108	11	.....	.....	2	293	306	1,802
Crescents	2,478	.....	.....	.....	27	.....	2,505	16	.....	.....	2	9	27	2,478
Wreaths	1,278	1,210	.....	125	10	.....	2,623	.....	125	.....	2	361	488	2,135
Bugles	31,369	1,100	.....	.....	422	.....	32,891	7	.....	.....	138	212	351	32,534
Numbers	139,588	36,000	.....	10,000	4,346	.....	189,934	31	10,000	.....	8,257	14,005	32,293	157,641
Lyres	3,315	800	.....	200	50	.....	4,365	.....	200	.....	190	175	565	3,800
Letters	128,056	30,000	.....	7,000	4,156	.....	169,212	11	7,000	.....	12,115	12,626	31,752	137,460
Overcoats:														
Kersey, made	12,204	.....	10,110	6,644	304	.....	29,262	41	5,744	.....	1,130	8,159	15,074	14,188
Kersey, unmade	1,486	.....	446	52	181	.....	2,165	36	52	.....	8	701	797	1,368
Buffalo	1,950	.....	.....	.....	.....	.....	1,950	2	.....	54	.....	13	69	1,881
Canvas and fur	4,911	.....	.....	.....	15	.....	4,926	82	.....	.....	.....	186	268	4,658
Devices, Hospital Corps	211	.....	14	.....	2	.....	227	.....	.....	.....	.....	51	51	176
Cape linings	38	.....	762	2	35	716	1,553	4	2	.....	.....	797	803	750

Uniform dress coats:														
Musicians', made	2,306		64	30	106	1	2,507	288	30	17	148	206	689	1,818
Musicians', unmade			2				2					2	2	
Noncommissioned staff and privates', made	9,517		4,989	3,468	566	179	18,719	2,396	2,639		1,452	4,518	11,005	7,714
Noncommissioned staff and privates', unmade	2,724		29	364	544		3,661	182	355	163		300	1,000	2,661
Blouses:														
Made	11,438		35,243	9,437	1,636		57,754	86	9,437	2	9,396	18,327	37,248	20,506
Unmade	1,681		28,793	15,210	120	2	45,806	90	16,115	1	288	22,544	39,038	6,768
Coats:														
Canvas, fatigue	24,643		14,561	2,000	634		41,838	44	2,000		460	14,193	16,697	25,141
Summer sack	3,272		85		408		3,765					1,276	1,276	2,489
Linen collars	192,479	65,016		62,400	1,235		321,130	209	51,600		24	74,633	126,466	194,664
Stable frocks	12,580		2,229	3,200	95		18,104	82	3,950			5,498	9,530	8,574
Overalls:														
Mounted ....pairs.	17,175		5,422	3,100	313	2	26,012	50	3,550			6,385	9,985	16,027
Engineers'....do....	593						593							593
Summer....do....	1,527						1,527							1,527
Trousers:														
Summer ....do....	2,139		58				2,197					208	208	1,989
Mounted, made....do....	20,748		8,745	6,666	1,627		37,786	831	6,486	1	789	7,500	15,607	22,179
Mounted, unmade ....do....	6,345		11,587	5,538	322		23,792	40	7,354			9,838	17,232	6,560
Foot, made ....do....	22,473		28,813	10,165	877	2	62,330	74	8,215		7,257	24,417	39,963	22,367
Foot, unmade ....do....	4,637		17,258	6,824	519		29,238	133	4,824		340	19,012	24,309	4,929
Canvas, fatigue....do....	20,272		19,348	4,300	593		44,513	24	4,300		485	19,946	24,755	19,758
Linen ....do....	736		10	142	435		1,323	2	142			799	943	380
Canvas leggings ....do....	20,958	18,521		11,512	170		51,161	28	10,300		12,667	11,213	34,208	16,953
Suspenders ....do....	47,664			6,300	406		54,370	56	6,600			10,671	17,327	37,043
Flannel shirts, D. B.:														
Made	60,101		12,862	11,551	769		85,283	30	11,550		25	25,739	37,344	47,939
Unmade	257		16		89	1	363	21		58		10	89	274
Undershirts, knit	94,701	37,600		21,799	622		154,722	50	19,967			56,383	76,400	78,322
Muslin shirts	3,196	47,037		465	191		50,889	139	635			46,017	46,791	4,098
Drawers, Canton flannel ....pairs..	47,720	1,613	53,483	34,000	596		137,412	110	34,600			66,404	100,514	36,898
Stockings:														
Woolen ....do....	67,198	62,320		75,500	464		205,482	63	44,500			83,840	128,403	77,079
Cotton ....do....	156,522	160,648		127,000	320		444,490	286	101,244			156,351	257,881	186,609
Gloves, Berlin	322,644	324,200		246,000	578		893,422	398	172,320		14,300	336,082	523,100	370,322
Mittens:														
Woolen....pairs..	11,513	3,001			1,109		15,623	433				4,006	4,439	11,184
Canvas....do....	9,215		100		573		9,888					2,740	2,740	7,148
Gauntlets:														
Fur ....do....	2,220	12,723		15,884			30,827	30	13,100		2	11,778	24,910	5,917
Leather ....do....	10,328	6,522		3,269	686		20,805	71	3,247		105	9,360	12,783	8,022
Boots:														
Brass-screwed ....do....	8,845				478		9,323	6		2		152	160	9,163
Sewed....do....	17,762			541	273		18,576	66	541		3	3,876	4,486	14,090
Shoes:														
Brass-screwed ....do....	13,053				1,297	96	14,446	20				234	254	14,192
Post....do....	1,844					63	1,907	1,397				69	1,466	441
Field....do....	4,705						4,705	2,343		33		510	2,886	1,819

A.—*Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department, etc.*—Continued.

Articles.	On hand June 30, 1892.	Purchased.	Manufactured.	Received from general depots.	Received from posts.	Gained.	Total received.	Sold.	Transferred to general depots.	Expended or dropped.	Issued to the militia.	Issued to the Army.	Total issued.	Remaining on hand June 30, 1893.
Shoes—Continued.														
Sewed, campaign.....do....	46,067	7	14,508	11,339	1,646	.....	73,567	1,103	11,079	139	.....	39,137	51,458	22,109
Sewed, calf-skin.....do....	.....	24,666	13,760	13,211	.....	.....	51,637	3	11,845	1	.....	30	11,879	39,758
Arctic.....do....	6,973	8,651	.....	6,450	76	.....	22,150	162	6,050	.....	.....	6,747	12,959	9,191
Barrack.....do....	10,374	25,154	.....	26,997	60	1	62,586	13	23,071	.....	.....	24,267	47,351	15,235
Blankets:														
Wool.....	17,898	18,513	.....	6,887	145	.....	43,443	10	6,500	.....	9,565	15,700	31,775	11,668
Rubber.....	173	.....	.....	.....	19	44	236	15	.....	.....	50	106	171	65
Ponchos, rubber.....	4,597	.....	.....	701	6	2	5,306	569	700	39	210	3,568	5,086	220
Chevrons,														
Gold lace.....pairs..	6,966	.....	1,193	.....	944	1	9,104	86	3	.....	720	2,233	3,042	6,062
Cloth.....do....	12,851	.....	8,299	6,363	339	89	27,941	155	6,360	1	2,275	10,736	19,527	8,414
Brassards.....	298	.....	1,384	.....	47	.....	1,729	.....	.....	.....	50	1,567	1,617	112
Aiquilettes and shoulder knots.....	357	1,000	.....	30	.....	.....	1,387	1	30	.....	100	235	366	1,021
Trouser stripes:														
Noncommissioned staff.....pairs..	226	.....	699	200	15	.....	1,140	7	200	.....	11	690	908	232
Sergeants'.....do....	3,114	.....	5,736	1,400	264	41	10,555	63	1,690	.....	1,359	6,047	9,159	1,396
Corporals'.....do....	3,971	.....	10,744	2,600	528	62	17,905	239	2,611	.....	2,309	10,660	15,819	2,086
Hospital corps.....do....	31	.....	1	.....	.....	.....	32	21	.....	.....	.....	1	22	10
Facings for dress coats.....	7,311	.....	395	4	1,468	.....	9,178	477	4	.....	50	671	1,202	7,976
Blouse trimmings.....	.....	.....	2,107	.....	.....	.....	2,107	3	.....	.....	2,101	3	2,107	.....
Trouser trimmings.....	.....	.....	2,942	.....	.....	.....	2,942	32	.....	.....	2,901	9	2,942	.....
Barrack bags.....	1,523	.....	3,583	2,800	282	.....	8,188	43	3,130	.....	.....	2,311	5,484	2,704
Iron bunks.....	1,434	.....	.....	.....	1,677	2	3,013	86	.....	.....	6	862	954	2,159
Bunk slats.....	560	.....	.....	.....	.....	.....	560	.....	.....	50	.....	.....	50	510
Woven-wire bunk bottoms.....	3,691	1,248	.....	726	252	.....	5,917	253	836	.....	6	4,134	5,229	688
Iron bedsteads with bunk bottoms....	915	1,135	.....	465	15	.....	2,530	24	100	14	50	1,105	1,293	1,237
Mattresses.....	2,976	1,000	.....	1,900	27	.....	5,903	23	1,600	.....	150	1,653	3,426	2,477
Mattress covers.....	12,984	.....	.....	5,350	150	.....	18,484	13	5,350	.....	.....	4,969	10,322	8,152
Pillows.....	5,878	1,000	.....	2,700	28	.....	9,606	24	2,700	.....	150	2,914	5,788	3,818
Pillow cases.....	11,227	24,014	2,788	20,003	235	.....	58,267	28	20,003	.....	162	24,638	44,831	13,436
Pillow sacks.....	2,508	.....	400	.....	326	.....	3,234	41	.....	.....	.....	514	555	2,679
Bed sacks.....	1,346	.....	1,200	300	140	.....	2,986	10	300	.....	100	888	1,298	1,688
Bed sheets.....	53,111	490	.....	9,500	255	.....	63,356	46	9,500	.....	162	12,807	22,515	40,841
Mosquito bars.....	2,015	4,973	.....	2,720	328	.....	10,036	214	1,800	.....	.....	4,341	6,355	3,681
Mosquito head nets.....	78	132	.....	126	.....	.....	336	.....	.....	.....	.....	198	198	138
Iron pots.....	922	.....	.....	.....	12	.....	934	1	.....	.....	.....	24	25	909
Camp kettles.....	4,040	.....	.....	2	6	.....	4,048	3	.....	.....	25	601	629	3,419
Mess pans.....	48,350	.....	.....	.....	355	.....	48,705	1,270	.....	.....	25	270	1,565	47,140
Axes.....	3,834	2,600	.....	1,250	20	.....	7,704	2	1,250	.....	36	2,188	3,476	4,228
Ax helves.....	9,680	6,500	.....	4,200	11	.....	20,391	6	4,200	13	36	6,132	10,387	10,004
Ax slings.....	1,019	.....	.....	.....	.....	.....	1,019	.....	.....	.....	14	2	16	1,003

Hatchets	12,186				22		12,208	12			34	858	904	11,304
Hatchet helves	9,044	1,000		500	11		10,555	1	500	22	14	1,198	1,735	8,820
Hatchet slings	950				8		958				8	6	14	944
Spades	11,935	100		100	429		12,564	58	106		8	314	486	12,078
Spade helves	41						41					12	12	29
Spade slings	197				8		205					1	1	204
Shovels	4,888	500		1,100	34		6,522	40	1,112		56	1,921	3,129	3,393
Shovel handles	77						77					24	24	53
Pickaxes	4,901				325		5,226		6		56	582	644	4,582
Pickax helves	3,697	1,200			61		4,958	2		6	56	947	1,011	3,947
Pickax slings	182				14		196							196
Drums	62	150		45	29		286	10	45		39	36	130	156
Drum heads, batter	579	1		3	108		691	53			14	160	227	464
Drum heads, snare	1,763			53	97	37	1,950	65	50		21	104	240	1,710
Drum slings	95	364		426	21		906	34	40		27	45	146	760
Drum rods	289				93		382					133	133	249
Drumsticks ..... pairs	3,502				50		3,552	7			43	43	93	3,459
Drumsticks, carriages	2,435				30		2,465				19	5	24	2,441
Drum snares ..... sets	2,703				54		2,757	12				60	72	2,685
Drum cases	82		55	35	15	6	193	14	35		26	14	89	104
Drum knee rests	10						10							10
Drum cords	14	11			1		26	11				10	21	5
Trumpets	210	1,000		461	584		2,255	6	165		143	768	1,082	1,173
Mouthpieces	59				108		167	10					10	157
Crooks	395	750		361	510		2,016	4	65		78	367	514	1,502
Bugles	67				12		79	2	2		6	26	36	43
Cords and tassels for trumpets and bugles	1,357	1,050		504	4		2,915	23	504		146	576	1,249	1,666
Fifes	1,950			311	33		2,294	5	311	8	24	53	401	1,893
Music pouches	266	240		37	16		559		2		47	294	343	216
Whistles		4,500					4,500	1		5	50	2,627	2,683	1,817
Books:														
Company, letters sent	145	200		95	1		441		95		8	150	253	188
Company, letters sent, index	127	200		70	2		399		70		7	130	207	192
Company, letters received	272			70	3		345		50		5	94	149	196
Company, letters received, index	305			65	1		371		65		5	90	160	211
Company, order	369	200		220	4		793		220		10	249	479	314
Post, letters sent	167	50		45	3		265		45			75	120	145
Post, letters sent, index	121	100		61	3		285		61			68	129	156
Post, letters received	128	50		100	3		281		100			94	194	87
Post, letters received, index	137	50		101	2		290		101			82	183	107
Post, order	269	100		35	3		407	2	35			43	80	327
Council of administration	145	100		10	1		256		10			29	39	217
Regimental, order	78						78					8	8	70
Regimental, letters sent	67			10	1		78		10		1	12	23	55
Regimental, letters sent, index	79			22			101		22		1	17	40	61
Regimental, letters received	69			10			79		10		1	19	30	49
Regimental, letters received, index	76			23			99		23		1	25	49	50
Tents:														
Conical wall	606		526	8	14		1,054	10	8		399	152	569	485
Sibley	197			4	3		204	2	4		3	1	10	194
Hospital	190		156	54	3	14	417	12	54		32	42	140	277

A.—*Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department, etc.*—Continued.

Articles.	On hand June 30, 1892.	Purchased.	Manufactured.	Received from general depots.	Received from posts.	Gained.	Total received.	Sold.	Transferred to general depots.	Expended or dropped.	Issued to the militia.	Issued to the Army.	Total issued.	Remaining on hand June 30, 1893.
Tents—Continued.														
Wall	1,106	.....	551	212	3	.....	1,872	44	258	.....	591	139	1,032	840
Common	3,382	.....	565	480	127	.....	4,554	227	479	.....	443	242	1,391	3,163
Shelter halves	14,173	.....	7,301	.....	.....	.....	21,474	540	.....	.....	.....	3,320	3,860	17,614
Tent flies:														
Hospital	226	.....	184	31	2	.....	443	13	31	.....	44	57	145	298
Wall	1,223	.....	546	214	10	.....	1,993	57	217	.....	496	188	958	1,035
Tent poles:														
Conical, Wall, and Sibley	1,244	700	.....	12	8	.....	1,964	1	12	2	402	112	529	1,435
Shelter	7,535	6,000	.....	.....	130	.....	13,665	191	.....	.....	.....	1,180	1,371	12,294
Hospital, upright	505	.....	.....	48	13	95	661	26	48	29	64	56	223	438
Hospital, ridge	394	.....	.....	24	16	48	482	11	24	16	32	30	113	369
Wall, upright	3,376	1,000	.....	14	19	.....	4,409	114	106	63	1,182	425	1,890	2,519
Wall, ridge	1,651	500	.....	7	.....	.....	2,158	39	53	5	591	224	912	1,246
Common, upright	14,722	.....	.....	1,058	.....	.....	15,780	16	1,058	283	880	303	2,540	13,240
Common, ridge	8,224	.....	.....	529	4	.....	8,757	5	529	106	440	178	1,258	7,499
Tent pins, wooden, all kinds	143,463	219,917	.....	15,021	.....	.....	378,401	1,788	14,502	225	56,607	124,688	197,810	180,591
Tent straps	1,170	.....	.....	12	8	5	1,195	1	12	.....	370	123	506	689
Tent slips, metal	13,674	36,000	.....	.....	.....	.....	49,674	.....	.....	33,378	.....	3,040	36,418	13,256
Tent rings	6,408	.....	.....	.....	.....	.....	6,408	.....	.....	530	.....	2	532	5,876
Tent rings, Sibley	67	.....	.....	.....	.....	.....	67	.....	.....	.....	.....	1	1	66
Tent stoves	1,359	50	.....	.....	.....	.....	1,409	8	.....	.....	64	54	126	1,283
Tent stovepipe joints	4,195	300	.....	.....	.....	.....	4,495	8	.....	.....	320	1,074	1,402	3,093
Tent pins, iron, large	2,500	.....	.....	.....	.....	.....	2,500	.....	.....	.....	.....	30	30	2,470
Tent pins, iron, small	5,000	.....	.....	.....	.....	.....	5,000	.....	.....	.....	.....	198	198	4,802
Tent tripods	1,374	.....	.....	12	8	.....	1,394	1	12	.....	402	111	526	868
Tent chains	643	400	.....	.....	.....	.....	1,043	.....	.....	533	.....	16	549	494
Tent-pole sockets	234	100	.....	.....	.....	.....	334	.....	.....	.....	.....	10	10	324
Flags:														
Post	69	154	205	534	1	.....	963	23	501	13	10	178	725	238
Garrison	19	85	.....	74	5	.....	183	.....	87	4	1	32	124	59
Storm and recruiting	262	432	200	850	12	.....	1,756	68	878	21	18	307	1,292	464
Field hospital	44	11	.....	1	.....	.....	56	.....	1	.....	2	11	14	42
General hospital	3	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	3
Colors:														
National	2	24	.....	1	.....	.....	27	.....	.....	2	10	8	20	7
Regimental	1	9	.....	.....	.....	.....	10	.....	.....	.....	3	3	6	4
Camp	98	51	.....	69	.....	.....	218	.....	69	15	5	90	179	39
Guidons:														
Artillery and cavalry	41	65	.....	9	.....	.....	115	.....	1	2	10	70	83	32
Ambulance	6	29	.....	.....	.....	.....	35	.....	1	.....	.....	28	29	6

Cases	4					22	26					22	22	4
Standards	1	2					3							3
Color cords and tassels	1					1	2					1	1	1
Color slings and belts	69				10		79		2		9		11	68
Color staff	135	68		61			264		30		28	135	193	71
Halliards:														
Garrison and post	371	104		50	35		560	15	50		3	81	149	411
Storm and recruiting	2,096				5		2,101	2				35	37	2,064
Devices	278	1,200					1,478		102	208			310	1,168
Stencils, complete	82			35	2	12	131	4				44	48	83
Stencil plates	16			1		21	38		35			2	37	1
Company marking stamps	18	19			6		43	2				22	24	19
Corn brooms	4,162	6,000	21,644	21,500	24		53,330	3	20,572	347		29,064	49,986	3,344
Scrubbing brushes	1,662	15,005		9,800		94	26,561		8,360	142		12,915	21,357	5,204
Alphabets	34				1		35					2	2	33
Numbers	34				6		40					2	2	38
Barrack chairs	703		4,517	300	4	1,591	7,115	2	301		710	5,899	6,912	203
Card holders	5,424			200	117		5,741		200			996	1,196	4,545
Hand litters	90				3		93				11	39	50	43
Coat buttons, large and small	407,513	1,118,160		336,816	669	882	1,864,040		245,273	1,036,800		12,303	1,294,376	569,664
Neckties	26,504	10,000					36,504	71			220	28,857	29,148	7,356
Cloth:														
D. B., ⅔ yards	8,691	28,088		7,940	171	166	45,056	597	1,316	9,530	2,726	3,721	17,890	27,166
Facing do	2,809	1,092		220	2		4,123	148	716	1,508	6		2,378	1,745
Italian do	1,581	9,488				134	11,203	14		2,579	675	50	3,318	7,885
Blanket lining do	6,155						6,155	2		50		10	62	6,093
Doeskin, sky blue do	258	655		64			977	529		34			563	414
Drilling do	13,791	77,005		2,405	45	4,735	97,981		2,866	87,238			90,104	7,877
Duck:														
Cotton do	87,879	313,267		9,518	13	1,048	411,725	57	9,518	191,893		49	201,517	210,208
Brown do	12,943	73,785		2,494	64		89,286		1,091	71,125		20	72,236	17,050
White, 8-ounce do	45,288	77,018		957			123,263	70		51,814			51,884	71,379
Flannel:														
Canton do	20,363	110,009		2,002	101	27,149	159,624	91	2,002	141,279		4,874	148,246	11,378
D. B. blouse, A. S do	3,306	181,825		11,167	848	1,362	198,508	331	3,620	125,047	3,706	3,417	136,121	62,387
D. B. blouse lining do	6,218	125,845			124	13,176	145,363	40	5,642	122,652		651	128,985	16,378
D. B. shirting do	84,388	16,725		2,033	26	2,745	105,917	144	802	34,198		693	35,837	70,080
Jeans, corset do	48,284	27,102				1,225	76,611	14	200	30,017	1,088	161	31,480	45,131
Kersey:														
Sky blue, ⅔ do	16,943	168,110		2,507	550	2,684	190,794	146	771	138,360	19,241	1,031	159,549	31,245
Dark blue do	4,192	184					4,376	4		3,639			3,643	733
Gray do	965						965	4		8			12	953
Gold lace do	2,149	1,513					3,662			952			952	2,710
Leather:														
Counters pounds	1,476	8,175		11,007			20,658	29		13,489			13,518	7,140
Viscolized do	86						86	6					6	80
Sole do	14,727	74,695		63,095			152,517	355	71,370	50,830			122,555	29,962
Waxed upper square feet	70,441	13,298		16,741			100,480		15,011	73,346			88,357	12,123
Pebble grain do	2,162						2,162	6					6	2,156
Welt pounds	2,303	4,595		4,437			11,335		4,068	6,435			10,503	832
Calf do	22	35,041		34,996			70,059	10	35,001	15,893			50,904	19,155
Muslin, unbleached yards	49,591	25,327		8,706	64	11,734	95,422	133	8,707	66,088		800	75,728	19,694

A.—*Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department, etc.*—Continued.

Articles.	On hand June 30, 1892.	Purchased.	Manufactured.	Received from general depot.	Received from posts.	Gained.	Total received.	Sold.	Transferred to general depots.	Expended or dropped.	Issued to the militia.	Issued to the Army.	Total issued.	Remaining on hand June 30, 1893.
Padding ..... yards..	28,356	108,744	.....	11,329	.....	1,753	150,182	1	11,360	95,957	.....	.....	107,318	42,864
Silesia ..... do...	15,530	24,000	.....	3,556	23	23,451	66,560	107	3,557	50,786	.....	51	54,501	12,059
Band instruments.														
Altos	5	13	.....	1	.....	1	20	.....	.....	.....	5	15	20	.....
Bassos, E♭	.....	14	.....	2	2	.....	18	.....	.....	.....	3	15	18	.....
Baritones	1	7	.....	1	1	.....	10	.....	.....	.....	1	8	9	1
Clarinets	8	21	.....	5	.....	.....	34	.....	.....	.....	6	24	30	4
Trombones	4	16	.....	8	.....	.....	28	.....	.....	.....	6	18	24	4
Cornets	6	21	.....	4	1	.....	32	.....	.....	.....	5	23	28	4
Piccolos	2	4	.....	5	.....	.....	11	.....	.....	.....	1	8	9	2
Flutes	3	5	.....	.....	.....	.....	8	.....	.....	.....	.....	4	4	4
Bass drums	2	12	.....	2	.....	.....	16	.....	.....	.....	2	12	14	2
Cymbals	1	9	.....	.....	.....	.....	10	.....	.....	.....	2	7	9	1
Triangles	1	3	.....	.....	.....	.....	4	.....	.....	.....	1	2	3	1
Bass-drum heads	10	44	.....	.....	1	.....	55	.....	.....	.....	.....	34	34	21
Bass-drum cords	3	16	.....	.....	.....	.....	19	.....	.....	.....	.....	15	15	4
Reeds	137	1,966	.....	.....	.....	453	2,556	.....	.....	.....	24	1,410	1,434	1,122
Bags, assorted	.....	.....	116	.....	2	.....	118	.....	.....	.....	14	65	79	39
Pads	174	9,792	.....	.....	.....	.....	9,966	.....	.....	12	24	4,193	4,229	5,737
Springs	55	1,332	.....	180	.....	.....	1,567	.....	.....	.....	33	1,444	1,477	90
Music stands	41	130	.....	.....	.....	.....	171	.....	.....	.....	18	146	164	7
Music holders	.....	17	.....	.....	.....	.....	17	.....	.....	.....	.....	17	17	.....
Sticks, bass drum	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	1	1	.....

6.

QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., July 19, 1893.

GENERAL: I have the honor to submit the following report, pertaining to the national military cemeteries, for the fiscal year ending June 30, 1893:

At the commencement of the year there were eighty-two national cemeteries. On September 10, 1892, the military cemetery at Santa Fe, N. Mex., embracing the site of the present post cemetery at Fort Marcy, N. Mex., was declared by the Secretary of War a national cemetery, of the fourth class, under the act of February 22, 1867, and designated as the Santa Fe, N. Mex., National Cemetery, making the number at the close of the year eighty-three.

Interments to June 30, 1893:

Known	181,842
Unknown	149,913
Total	331,755

At the commencement of the year there were seventy-three superintendents in service. During the year, four others have been appointed, two have been discharged, and two died, leaving seventy-three in service at the close of the year.

Removals of remains of officers and enlisted men have been made from abandoned posts to other posts or national cemeteries, as follows, viz: From Fort Klamath, Oregon., Fort Colville, Wash., Lava Beds, Cal., Tubac and Old Camp Grant, Ariz., to the San Francisco (Cal.) National Cemetery. From Fort Downer, Kans., and Fort Randall, S. Dak., to the Fort Leavenworth (Kans.) National Cemetery. From the Chickamauga and Chattanooga National Park to the Chattanooga, (Tenn.) National Cemetery. From the Columbia Arsenal, Tenn., to the Nashville (Tenn.) National Cemetery. From Kenesaw Mountain, Georgia, to the Marietta (Ga.) National Cemetery. From Morris Island, South Carolina, to the Beaufort (S. C.) National Cemetery. From the Cheyenne depot, Wyoming, to the post cemetery at Fort D. A. Russell, Wyo.; and from the military reservation at Fort Thomas, Ky., to the Soldiers' Lot, in the Evergreen Cemetery, Newport, Ky. Remains of other United States soldiers discovered from time to time in out of the way places, have also been removed to the nearest national cemetery.

Headstones.—During the year 9,168 white marble headstones to mark the graves of Union soldiers, sailors, and marines buried in national, post, city, and village cemeteries were provided from the appropriations for that purpose. This completed the contract for 15,000 headstones made September 5, 1891, with Messrs. Gross Bros., Lee, Mass., and on June 27, 1893, another contract for 10,000 headstones was awarded to the same persons.

Outbuildings.—During the latter part of the year contracts were made for the erection of new brick outbuildings to be constructed in accordance with plans and specifications prepared in this office, to replace the old wooden structures in the national cemeteries at Fort Leavenworth (Kans.) Soldiers' Home, District of Columbia and Culpeper, and Yorktown, Va., and for a stone outbuilding of similar design in the Grafton (W. Va.) National Cemetery.

A contract was also made for the construction of a receiving vault in the Arlington (Va.) National Cemetery.

Rostrums.—A contract was made for supplying the iron work required for the superstructures of permanent rostrums to be erected in the Annapolis (Md.), Yorktown (Va.), Fort Donelson (Tenn.), and Fayetteville (Ark.) national cemeteries. The work of constructing the foundations for and erecting the superstructures to be commenced at an early date after the close of the fiscal year.

Flagstaffs.—During the year iron flagstaffs (Nelson patent), 75 feet in length, have been erected in the Alexandria, Culpeper, and Danville (Va.), and Grafton (W. Va.) national cemeteries, and one 100 feet in length in the Natchez (Miss.) National Cemetery.

Wooden flagstaffs have been erected in the Fort Scott (Kans.), Lebanon (Ky.), Little Rock (Ark.), and New Albany (Ind.) national cemeteries and in the soldiers' lot in the city cemetery at Baxter Springs, Kans., and a contract made for the erection of one in the Danville (Ky.) National Cemetery at an early date.

Memorial day, May 30.—Appropriate services were held in nearly all the national cemeteries and the graves decorated as usual.

At the Alexandria (Va.) National Cemetery necessary repairs have been made to the lodge, outbuildings, water supply and drainage; a part of the inclosing wall at the entrance of the cemetery reconstructed and provided with a pair of ornamental wrought-iron drive and walk gates, and the approach to the cemetery put in good condition.

At the Arlington (Va.) National Cemetery repairs have been made to the mansion and outbuildings, and the grounds, drives, drainage, and water supply kept in good order. Additional drainage and catch basins have been provided for the roadway in the new addition, and a granolithic foot walk laid from the western entrance, to connect with the pavement heretofore constructed around the mansion.

At the Brownsville (Tex.) National Cemetery necessary repairs have been made to the lodge, and the posts of the fence inclosing the cemetery renewed.

At the Cave Hill (Ky.) National Cemetery the outbuilding has been repaired. Arrangements have been made with the Cave Hill Cemetery Company, of Louisville, Ky., for the transfer to the United States of a piece of land containing 15,934 square feet, more or less, situated between sections B and C of the national cemetery grounds, and in which upwards of 200 bodies of Union soldiers were buried in 1868, when removed from the battlefields in the vicinity.

At the Chalmette (La.) National Cemetery the necessary repairs have been made to the lodge, outbuildings, etc.

The approach to the cemetery has been practically demolished for the distance of 1,875 feet to make room for a new levee which was constructed during the past winter by the Engineer Department, U. S. Army. It is understood that the work is to be continued next season.

At the City Point (Va.) National Cemetery the lodge has been thoroughly repaired, and the grounds, water supply, and drainage put in order.

At the Custer Battlefield (Montana) National Cemetery the post and wire fence inclosing the cemetery reservation has been put in thorough repair, and one large gate with arch and one small one (turnstile) constructed.

Four hundred and seventy-five headstones have been reset in brick and cement, and the monument erected in memory of Gen. Custer and the officers and men who fell with him June 25, 1876, has been repaired.

In consequence of the unprotected condition of the cemetery visitors

and relic hunters have almost entirely destroyed the marble headstone marking the place where Gen. Custer fell.

It is contemplated to permanently inclose with a brick or stone wall and improve a part of the reservation for cemeterial purposes, and to erect a superintendent's lodge, the plans and specifications for which have been prepared and the necessary appropriation requested.

Since the close of the fiscal year a superintendent has been placed in charge of this cemetery.

At the Danville (Va.) National Cemetery about 50 feet of the inclosing wall has been taken down and rebuilt.

By direction of the Secretary of War, and in compliance with the request of the authorities of that city, a strip of land 36 feet wide, belonging to the United States, outside the inclosing wall on the east side of the national cemetery, was left open as an entrance to the colored cemetery adjoining the national cemetery on the south side, said authorities having agreed to grade the ground as a street and keep the same in good condition.

At the Fayetteville (Ark.) National Cemetery necessary repairs were made to the lodge, outbuildings, and water supply, and a part of the inclosing wall repointed. The approach to the cemetery has been repaired, the ditches cleaned out, and 17 linear yards of new stone culvert constructed.

At the Gettysburg (Pa.) National Cemetery the monument erected by the State of New York in memory of the dead of that State who fell in the battle of Gettysburg, July, 1863, has been completed. The monument was dedicated with appropriate ceremonies on July 2, 1893, the thirtieth anniversary of the battle. Fully 10,000 persons were present. Appropriate addresses were made by the governors of the States of New York and Pennsylvania, and by other distinguished persons.

At the Hampton (Va.) National Cemetery the erection of the inclosing wall of the addition to the cemetery, commenced during the last fiscal year, has been completed.

At the Keokuk (Iowa) National Cemetery necessary repairs were made to the lodge, outbuildings, etc., and the wrought-iron picket fence (about 1,500 feet) repainted.

At the Memphis (Tenn.) National Cemetery the lodge has been thoroughly repaired and painted, all obstructions removed from the drain-pipes, and the pipes relaid in cement; 5 silt basins were entirely rebuilt and the remainder repaired.

At the Mexico City National Cemetery the lodge and inclosing wall have been repaired. In consequence of the limited space remaining for interments in that cemetery it has been deemed advisable to restrict the interments to those positively known to be American citizens.

At the Mill Springs (Ky.) National Cemetery repairs were made to the lodge, a new picket fence erected, and the water supply improved by sinking a well.

At the Philadelphia (Pa.) National Cemetery the lodge and outbuilding were repaired, the inclosing wall repointed where necessary, and the windmill connected with the water supply repaired.

At the Richmond (Va.) National Cemetery a new brick outbuilding has been erected, and the necessary repairs made to the lodge, inclosing wall, and drainage.

At the Rock Island (Ill.) National Cemetery the inclosing fence (iron) and the speaker's stand have been thoroughly repaired and painted, and the grounds cleaned up and put in good order.

At the San Francisco (Cal.) National Cemetery the grounds and walks have been properly cared for and are in good condition. The water supply is sufficient for present needs.

A granite monument, surmounted by a statue representing a soldier at "parade rest," erected in the cemetery by George H. Thomas Post No. 2, G. A. R., was dedicated with appropriate ceremonies on Memorial day, May 30.

At the Stone River (Tenn.) National Cemetery the lodge, outbuildings, inclosing wall, drainage, and grounds have been put in good order. The Hazen Brigade lot has been cleaned up and the grass neatly cut on the graves.

At the Woodlawn (N. Y.) National Cemetery 241 linear feet of stone flagging, 5 feet wide, was laid on the Davis street front, and the drainage improved by removing stones from the bed of the creek which forms the southern boundary of the cemetery.

At other national cemeteries repairs have been made to the lodges, outbuildings, and the grounds properly cared for.

Soldiers' lots.—The inclosing fence of the soldiers' lot in the Baxter Springs (Kansas) city cemetery has been repainted and a new wooden flagstaff erected.

Indigent soldiers.—Under the acts of Congress—deficiency, approved July 28, 1892, and sundry civil, approved August 5, 1892—making appropriations "for expenses of burying in Arlington National Cemetery, or in the cemeteries of the District of Columbia, indigent ex-Union soldiers, sailors, and marines of the late civil war who die in the District of Columbia," accounts have been paid during the fiscal year for the burial of 43 such persons at a total cost of $1,872.50.

Roadways.—The roadway from the Mound City National Cemetery to Mounds Junction on the Illinois Central Railroad, in Pulaski County, Ill., a distance of 14,469 feet, for the construction of which an appropriation of $10,000 was made by act (sundry civil) approved March 3, 1891, is not yet completed. The work has been delayed by floods and high water, but is now nearly finished.

Amount expended to June 30, 1893, $4,139.92.

The work of draining and repairing the road to the Hampton (Va.) National Cemetery, under act (sundry civil) approved March 2, 1889, and August 30, 1890, is still awaiting the action of the legislature of Virginia relative to grant of right of way.

Under the act (sundry civil) approved August 5, 1892, making an appropriation for repairs to roadways to national cemeteries which have been constructed by special authority of Congress, necessary repairs have been made to the roadways leading to the Alexandria, Va.; Antietam, Md.; Corinth, Miss.; Culpeper, Va.; Fayetteville, Ark.; Florence, S. C.; Fredericksburg, Va.; Marietta, Ga.; Mound City, Ill.; Newbern, N. C.; Port Hudson, La.; Richmond, Va.; Springfield, Mo.; Staunton, Va., and Vicksburg, Miss., national cemeteries.

Amount expended during the year, $5,030.45.

Monuments or tablets at Gettysburg.—Under the acts of March 3, 1887, October 2, 1888, and March 2, 1889, authorizing and directing the acquirement of lands for sites for monuments or tablets to mark the positions occupied by organizations of the regular Army on the Gettysburg battle field, a survey of the field has been made, the positions of the various commands designated on the ground, and the title papers for the purchase of the sites are now nearly perfected. These sites are generally about 25 feet square with an approach thereto from the nearest public highway.

Under date of April 17, 1893, a contract was made for furnishing and putting in place 40 cast-iron tablets, with suitable inscriptions, and 25 iron gun carriages to mark these positions. This work is now in progress.

Antietam Board.—The agents appointed by the Secretary of War, to carry out the provisions of the acts of Congress (sundry civil) approved August 30, 1890, and August 5, 1892, and March 3, 1893, making appropriations "for the purposes of surveying, locating, and preserving the lines of battle of the Army of the Potomac and of the Army of Northern Virginia at Antietam, etc.," have reported to this office that the work of locating the lines of battle of the Army of the Potomac and of the Army of Northern Virginia at Antietam has progressed favorably. The lines of battle of both armies have been marked on first map, and a second map of a series of three maps is under way.

The positions of the batteries of both armies have been generally determined upon, and a map of the same is now being made.

The agents further report that they have interviewed a number of the farmers owning land upon which such tablets are to be placed, and found that the parties are unwilling to sell directly, preferring that their land be condemned and appraised by a commission appointed by a United States court.

The agents invite attention to the fact that thousands of persons visit the Antietam battle field annually. They state that on some of these fields, notably those in the vicinity of the Dunkard Church, East Woods, and the Bloody Lane, a large number of tablets will be located, and they think in justice to the farmers owning these fields roadways should be constructed to enable visitors to inspect these tablets without trespassing upon and injuring growing crops, etc.

A statement showing the expenditures on account of the national cemeteries during the year is submitted herewith.

Very respectfully,

M. I. LUDINGTON,
Deputy Quartermaster-General, U. S. Army.

The QUARTERMASTER-GENERAL, U. S. ARMY,
Washington, D. C.

A.—*Statement of disbursements of appropriation for national cemeteries during the fiscal year ending June 30, 1893.*

Name of cemetery.	Employés.	Tools, stores, and miscellaneous expenditures.	Improvement of grounds.	Inclosures.			Repair of lodges.	Outhouses (sheds, stables, etc.).	Trees, plants, etc.	Drainage.	Barrack and office furniture and stoves.
				Construction.	Repair.	Gates.					
Alexandria, La	$293.00	$11.50					$3.60	$0.90			
Alexandria, Va	380.00	12.14	$79.15		$125.13	$650.00	48.75	23.00		$17.50	
Andersonville, Ga	654.08	51.50	47.32			10.00			$29.80		
Annapolis, Md	75.50	22.50					9.92	1.50		.75	
Antietam, Md	425.00	6.16					20.00				
Arlington, Va	7,996.00	307.42	12,555.11			40.00	167.00	537.76	1,080.00	1,143.10	$41.00
Balls Bluff, Va	25.00										
Barrancas, Fla	316.00	58.14			18.00						1.50
Baton Rouge, La	390.00	15.70	2.85						16.50		
Battle Ground, D. C		8.50	15.75				11.00	8.25			25.00
Beaufort, S. C	648.50	12.80	99.00				3.30	3.40			
Beverly, N. J		11.92	32.50								
Brownsville, Tex	455.00	24.50	138.00		50.00		73.00				
Camp Butler, Ill	167.50	50.60	2.65		15.90		26.30	12.30			4.70
Camp Nelson, Ky	190.00	184.01									
Cave Hill, Ky		5.40						85.01			
Chalmette, La	1,071.50	27.05					35.00			3.25	
Chattanooga, Tenn	2,614.50	51.20	205.00								
City Point, Va	269.12	67.47	75.00				487.00	24.20	22.00	49.25	20.75
Cold Harbor, Va		28.05	78.39		2.50			52.50	2.00		
Corinth, Miss	880.00	51.65						47.96		114.85	
Crown Hill, Ind											
Culpeper, Va	180.00	2.65	2.05		24.00		31.70				
Custer Battlefield, Mont					178.71						
Cypress Hills, N. Y	874.50		25.95				36.50	20.60			1.90
Danville, Ky	125.00										
Danville, Va	120.00	39.50	22.05		221.38		48.00	12.00			
Fayetteville, Ark	200.00	91.48	79.15		10.00	1.50	11.25	4.80	12.32		.25
Finns Point, N. J	4.17	70.80	162.31				16.09	16.85		29.30	8.20
Florence, S. C	165.75	24.75	48.40				10.00		13.00		
Fort Donelson, Tenn	122.00	21.85	33.00			10.00	7.50				
Fort Gibson, Ind. T	200.00	55.80					36.54	50.00			
Fort Harrison, Va	25.00	36.55	46.00				21.37	76.50		11.50	9.50
Fort Leavenworth, Kans	638.25	2.10			1.50			37.20			
Fort McPherson, Nebr	199.50	26.00	3.75				12.00				
Fort Scott, Kans	210.00	59.25	653.26				31.75	2.00			4.50
Fort Smith, Ark	270.00	77.00	51.00		15.00		45.95	11.75	12.76		
Fredericksburg, Va	574.00	17.05	35.00		3.00		35.00	25.00			
Gettysburg, Pa	524.00	47.80	373.10		188.00		9.50	1.88			
Glendale, Va		12.43	20.00				63.00				7.25
Grafton, W. Va	180.00	14.44	21.10				15.00	5.75			
Hampton, Va	526.40	18.58	532.00	$8,357.89	10.75	1,250.00	44.00	31.50	140.00	24.00	

Jefferson Barracks, Mo	1,157.91	78.14					32.50	45.00			
Jefferson City, Mo	86.37	5.85			4.50		10.35		4.20		
Keokuk, Iowa	72.00	23.65			135.00		10.55	43.00			3.22
Knoxville, Tenn	193.00	74.33					3.25		2.70		
Lebanon, Ky	90.00	4.12	37.50				52.30				
Lexington, Ky	75.00										
Little Rock, Ark	392.50	27.98	53.75		26.30			22.50	15.00	110.30	
Loudon Park, Md	210.00	3.80	112.12			5.00			48.75		
Marietta, Ga	1,044.38	102.60	126.50				28.37			168.56	
Memphis, Tenn	1,247.00	296.96	6.95		85.80		429.55			12.75	
Mexico City, Mex	332.00	2.25	10.50		15.00		85.00				
Mill Springs, Ky	90.00	9.95		117.50							
Mobile, Ala	70.50	27.10									
Mound City, Ill	413.75	5.25	104.60								10.40
Nashville, Tenn	1,977.90	118.32	242.13				13.92	1.30			
Natchez, Miss	598.50	25.03									
New Albany, Ind	247.50	18.50	13.75				22.60		.60		
New Berne, N. C	160.00								22.50		9.00
Philadelphia, Pa	982.00	43.68	6.00		5.00		193.10	85.00			
Poplar Grove, Va	303.50	29.29	3.40				5.00	15.00			
Port Hudson, La	328.50	163.80	30.80				30.80		5.00		
Quincy, Ill	25.00										
Raleigh, N. C	213.25	6.25	55.25		18.75		15.25	3.00			
Richmond, Va	430.00	16.68			2.00		23.88	613.70		3.75	
Rock Island, Ill			150.00		200.00			150.00			
Salisbury, N. C	229.31	191.89	5.75		2.75		11.00	1.35	7.50		
San Antonio, Tex	111.75	7.50	15.00				3.00		15.00		
San Francisco, Cal	515.38	6.75									
Seven Pines, Va		9.45	10.90				110.00				
Shiloh, Tenn	559.08	28.30	71.80				166.00	6.20			
Soldiers' Home, D. C	908.20	28.74	135.00						81.11	25.00	
Springfield, Mo	220.40	42.50	21.75		6.00		3.00				14.45
St. Augustine, Fla	81.25										
Staunton, Va	60.60	11.70	20.20				29.50				
Stones River, Tenn	638.45	26.75	125.40					29.58			
Vicksburg, Miss	3,247.00	35.00						3.00	10.00		
Wilmington, N. C	135.75	67.33	13.13		6.33		.20	1.30			
Winchester, Va	225.00	13.65	37.50		22.25			4.00			18.00
Woodlawn, N. Y	100.00		225.20						10.00	25.25	
Yorktown, Va	118.00	5.48	48.10				15.00	20.00			
Soldiers' Lots	222.20				150.00						
Miscellaneous		187.20									
Total	40,111.60	3,372.01	17,121.82	8,475.39	1,543.55	1,966.50	2,654.14	2,130.79	1,556.49	1,739.11	179.62

A.—*Statement of disbursements of appropriation for national cemeteries during the fiscal year ending June 30, 1893*—Continued.

Name of cemetery.	Flagstaffs and monuments.	Water supply.	Interments.	Fuel.	Forage.	Shoeing animals.	Transportation, tolls, etc.	Repairs to harness.	Flags and halyards.	Lawn mowers.	Total.
Alexandria, La		$11.10		$31.50	$92.25		$10.00	$1.50			$455.35
Alexandria, Va	$259.00	57.50		72.19							1,724.36
Andersonville, Ga		22.00			207.70	$27.65					1,050.05
Annapolis, Md		45.50		65.28			12.00				232.95
Antietam, Md				69.00			36.00				556.16
Arlington, Va	146.30	24.95	$375.00	333.58	530.62						25,277.84
Balls Bluff, Va											25.00
Barrancas, Fla		43.10						4.00			440.74
Baton Rouge, La				39.21	84.82	2.00					551.08
Battle Ground, D. C		7.50		81.49							157.49
Beaufort, S. C			33.25	63.00	212.78						1,076.03
Beverly, N. J		37.50		74.80							156.72
Brownsville, Tex	1.00	127.40		70.00		13.50	4.50				956.90
Camp Butler, Ill	8.33	5.00		38.24							331.52
Camp Nelson, Ky		11.00		57.70	67.63		3.70				514.04
Cave Hill, Ky		13.30		48.94							152.65
Chalmette, La				73.50	111.77	12.44					1,334.51
Chattanooga, Tenn		37.00		36.66	268.95	31.50					3,244.81
City Point, Va		5.00		90.60	98.92	4.00					1,213.31
Cold Harbor, Va	3.50			60.00							226.94
Corinth, Miss			2.50	49.18	233.92	44.00	14.00				1,438.06
Crown Hill, Ind											
Culpeper, Va	303.00			43.06			29.00				615.46
Custer Battlefield, Mont	300.00										478.71
Cypress Hills, N. Y	10.00	57.20		67.32	58.52	13.00					1,165.49
Danville, Ky											125.00
Danville, Va	292.00	57.50		79.47							891.90
Fayetteville, Ark		4.00		32.00							446.75
Finns Point, N. J		5.00		85.00							397 72
Florence, S. C				32.00							293.90
Fort Donelson, Tenn				38.15							232.50
Fort Gibson, Ind. T		10.00		29.74							382.08
Fort Harrison, Va	3.00	8.00		72.00							309.42
Fort Leavenworth, Kans	2.05	7.45		84.00	85.94						858.49
Fort McPherson, Nebr		70.00									311.25
Fort Scott, Kans	112.00			22.60			2.75				1,098.11
Fort Smith, Ark	.75	17.40		36.94							538.55
Fredericksburg, Va	3.00	24.50	5.00	65.28	89.09	1.25					877.17
Gettysburg, Pa	35.50	30.75		68.00			61.75				1,340.28
Glendale, Va	4.50	3.00		51.84							154.77
Grafton, W. Va	307.12			25.98			6.00				582.64
Hampton, Va	81.00	1.50	76.50	70.43			50.00				11,214.55
Jefferson Barracks, Mo	5.14	28.50		67.68	116.25						1,531.12
	7.59	16.00		55.68							190.54

Keokuk, Iowa	1.50	2.70		64.00							355.62
Knoxville, Tenn		6.30		33.52							313.12
Lebanon, Ky	113.00			51.08							348.00
Lexington, Ky											75.00
Little Rock, Ark	120.00			56.00	89.57	12.50					926.40
Loudon Park, Md	15.00	1.00	27.25	72.86							495.70
Marietta, Ga	8.72			59.67	224.76	21.40					1,784.98
Memphis, Tenn		3.00	3.50	18.20	177.88	11.00					2,292.59
Mexico City, Mexico		40.74	4.37	140.00							629.86
Mill Springs, Ky				34.40							251.85
Mobile, Ala				61.25							158.85
Mound City, Ill				36.90	76.53	10.50					657.93
Nashville, Tenn		36.40		50.01	184.93	18.85	23.00				2,666.76
Natchez, Miss	288.00			58.87	97.83	7.50					1,075.73
New Albany, Ind	56.00	66.00		38.90							463.85
Newberne, N. C	2.50			51.00	114.30						359.30
Philadelphia, Pa		20.50		105.56	114.65	15.00	9.60				1,580.09
Poplar Grove, Va	27.75		2.00	62.40	114.58	4.50					567.42
Port Hudson, La	11.25	39.30		35.00	117.88	5.00					767.33
Quincy, Ill											25.00
Raleigh, N. C				50.40							362.15
Richmond, Va	2.93			48.96	92.03	8.75					1,242.68
Rock Island, Ill											500.00
Salisbury, N. C	4.50			30.87	56.55	3.82					555.29
San Antonio, Tex		10.00	15.00								177.25
San Francisco, Cal		33.84		125.76							681.73
Seven Pines, Va	2.00	12.00	3.00	68.00							215.35
Shiloh, Tenn				38.15	99.90	6.00					975.43
Soldiers' Home, D. C		15.00	45.00	68.46	30.11						1,336.62
Springfield, Mo	1.80	7.00		43.06							359.96
St. Augustine, Fla											81.25
Staunton, Va	4.00	6.00	7.50	49.00							187.90
Stone River, Tenn			8.60	45.86	91.06	5.00	36.00				1,006.70
Vicksburg, Miss		151.60		99.39	183.94	28.88					3,758.81
Wilmington, N. C		7.20		60.20							291.44
Winchester, Va		1.00	12.00	68.68			11.00				413.08
Woodlawn, N. Y											360.45
Yorktown, Va	40.50	9.65		54.00							310.73
Soldiers' lots	62.00										434.20
Miscellaneous									$852.50	$1,721.42	2,761.12
Total	2,646.23	1,257.88	620.47	4,262.45	4,125.66	308.04	309.30	5.50	852 50	1,721.42	96,960.47

The balance of the appropriation ($100,000) is in the hands of officers of the Quartermaster's Department, and is required for the payment of outstanding indebtedness.

REPORT OF MAJ. A. S. KIMBALL, QUARTERMASTER U. S. ARMY.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., July 28, 1893.

GENERAL: I have the honor to submit herewith reports of the operations of the transportation and regular supplies branches of the office during the fiscal year ending June 30, 1893:

TRANSPORTATION BRANCH.

Through this branch the Quartermaster-General supervises and controls all matters growing out of the transportation of troops and supplies for the Army, and the large and constantly increasing transportation furnished by the Quartermaster's Department for the other Executive Departments of the Government. All information relative to the transportation service and all estimates of funds required to conduct same are prepared in this branch.

All transportation accounts which for any reason, legal or technical, can not be settled by the disbursing quartermasters stationed throughout the country, including the accounts of the bond-aided Pacific railroads, together with such telegraph accounts for messages on Army business as are not filed with the accounts of disbursing quartermasters, are examined and settled through this branch of the office.

The expenditures from the transportation appropriation, so far as accounts had been received July 1, 1893, as shown by all accounts paid by disbursing quartermasters (see report of accounts branch), account of the bonded Pacific railroads, and other transportation accounts settled through the transportation branch, was $2,286,915.76.

The following statement shows that during the fiscal year 1893 transportation was furnished for 367,577 persons, 6,948 animals, and 99,692 tons of material:

	Railroad.	Water.	Wagon.	Stage.	Government vessels.	Total.
Passengers:						
Officers	1,705	227	.....	22	22,960	24,914
Men	32,740	5,396	.....	1,368	303,159	342,663
Total	34,445	5,623	.....	1,390	326,119	367,577
Animals:						
Horses	4,995	693	.....	.....	97	5,785
Mules	1,045	114	.....	.....	4	1,163
Total	6,040	807	.....	.....	101	6,948
Stores, pounds:						
Subsistence	28,978,047	2,544,503	16,750,690	515	2,647,277	50,921,032
Quartermaster	38,882,090	1,637,096	36,952,273	4,599	2,559,199	80,035,257
Ordnance	11,603,836	2,075,016	3,241,170	2,986	2,274,962	19,197,970
Medical	1,212,590	109,657	1,648,598	1,170	56,538	3,028,553
Signal Service	396,557	35,921	242,864	277	.....	675,619
Miscellaneous	14,034,284	1,063,715	22,468,286	1,095	7,959,381	45,526,761
Total	95,107,404	7,465,908	81,303,881	10,642	15,497,357	199,385,192

MOVEMENTS OF TROOPS.

The principal movements of troops during the year, with cost of same, exclusive of deductions on account of land-grant and bond-aided railroads, have been as follows:

Troops.	Movements.	Cost.
3d Artillery . } 4th Artillery. }	Headquarters and batteries interchanging station in Department of the East.	$14,327.04
1st Cavalry....	Two troops changing station in Department of Arizona	175.45
2d Cavalry.....	Five troops changing station in Department of Arizona	1,413.56
3d Cavalry.....	Three troops changing station in Department of Texas	3,560.89
	Transfer of regiment from Department of Texas to Department of the Missouri.	15,545.65
4th Cavalry....	Three troops changing station in Department of California	870.17
5th Cavalry....	Transfer of regiment from Department of the Missouri to the Department of Texas.	17,462.15
6th Cavalry....	One troop from Department of the Platte to Department of the Missouri.	1,134.32
	One troop changing station in Department of the Platte	1,214.70
7th Cavalry....	Three troops changing station in Department of the Missouri	1,967.79
8th Cavalry....	One troop from Department of Dakota to Department of the Missouri...	1,632.50
9th Cavalry....	One troop from Department of the Missouri to Department of the Platte.	2,388.31
	One troop changing station in Department of the East	548.46
10th Cavalry...	Two troops changing station in Department of Dakota	1,107.02
3d Infantry....	One company changing station in Department of Dakota	396.53
10th Infantry..	One company changing station in Department of Arizona	301.72
	One company changing station in Department of the Missouri	237.55
	One company from Department of the Missouri to Department of Arizona.	1,912.46
11th Infantry..	Three companies changing station in Department of Arizona	1,050.83
13th Infantry..	Headquarters and band changing station in Department of the Missouri.	870.70
	Three companies changing station in Department of the Missouri	466.01
14th Infantry..	Two companies changing station in Department of the Columbia	967.68
18th Infantry..	Three companies changing station in Department of Texas	1,377.47
19th Infantry..	One company changing station in Department of the Missouri	200.00
21st Infantry ..	Three companies changing station in Department of the Platte	1,101.91
23d Infantry...	Three companies changing station in Department of Texas	711.70
Various.....	World's Columbian Exposition	37,892.51
	Military parade, inaugural ceremonies	1,436.20
Cadets and troops, Department of the East.	Columbian celebration	8,088.11
Various.....	Memorial day, May 30, troops from New York Harbor to New York City and Brooklyn and return.	61.05
3d Artillery, B.	Naval Review, Fort Monroe, Va., to Fort McHenry and Baltimore, Md., and return.	245.50
Various, not stated.	Strikes, Cœur d'Alene mining district	32,007.15
	Garza insurrection	8,113.64
Various.....	International Boundary Survey Commission, United States and Mexico..	3,190.67
	Investigating Indian troubles, and making surveys, Navajo Reservation.	413.73
	Total amount expended in the principal movements of troops during the year.	164,391.13

SUMMER ENCAMPMENTS AND RIFLE COMPETITION.

From reports received it is shown that there was expended during the fiscal year 1893 in the transportation of troops in connection with summer encampments, practice marches, field maneuvers, and instructions, the sum of $14,010.76; also of the transportation of enlisted men to engage in target practice and rifle competition, the sum of $34,831.25.

Where expended.	Summer camps.	Rifle competition.
Department of the East	$124.36	$11,848.16
Department of the Missouri	.....	3,833.06
Department of the Platte	12,206.81	8,606.72
Department of Dakota	45.80	3,753.58
Department of Texas	479.23	1,523.23
Department of Arizona	519.96	3,429.93
Department of California	327.63	71.15
Department of the Columbia	306.97	1,765.42
Total	14,010.76	34,831.25

BOND-AIDED PACIFIC RAILROADS, THEIR LEASED LINES AND BRANCHES.

Seven thousand four hundred and forty-two persons, 1,664 animals, and 37,413,656 pounds of freight were transported for the Department over the bond-aided Pacific railroads, their branches, and leased lines during the year.

The service performed by each road is shown in the following table:

Company.	Persons transported.	Animals transported.	Freight transported.
			Pounds.
Union Pacific	3,001	830	17,218,958
Central Pacific (branches and leased lines operated by the Southern Pacific Company)	3,061	210	16,026,377
Sioux City and Pacific	1,380	624	4,168,321
Total	7,442	1,664	37,413,656

Fourteen hundred and forty-four accounts of these railroads, aggregating $340,805.86, were received at this office during the year for settlement through the Treasury, as required by law. Of this amount $178,024.46 inured to the Union Pacific, $160,956.78 to the Central Pacific (branches and leased lines), operated by the Southern Pacific Company, and $1,824.62 to the Sioux City and Pacific.

Of these accounts 518, aggregating $67,867.47, were for transportation performed for other departments of the Government under law of July 5, 1884, and of this amount $37,025.62 was for service over the Union Pacific, $30,834.09 over the Central Pacific (branches and leased lines), operated by the Southern Pacific Company, and $7.76 over the Sioux City and Pacific Railroad.

The following is a statement of the analysis of the accounts of these companies for the year, showing amounts for troops and stores and for bonded and nonbonded service, respectively:

Company.	Amount of accounts received in Quartermaster-General's Office.	Estimated amount of accounts not rendered.	Portions inuring for troops.	Portion inuring for stores.	Proportion subsidized.	Portion unsubsidized.	Total amount.
Union Pacific	$178,024.46	$43,483.18	$56,440.17	$165,067.47	$197,688.79	$23,818.85	$221,507.64
Southern Pacific Company, operating Central Pacific R. R.	160,956.78	66,196.10	43,632.83	183,520.05	79,777.90	147,374.98	229,152.88
Sioux City and Pacific	1,832.38	1,020.52	1,355.40	1,497.50	2,649.84	203.06	2,852.90
Total	340,813.62	110,699.80	101,428.40	350,085.02	280,116.53	171,396.89	451,513.42

VESSELS IN THE SERVICE OF THE QUARTERMASTER'S DEPARTMENT.

This department has kept in its service, for use at points where constant service is required, eight steamboats and one sloop, owned by the department, the cost of maintaining which, including repairs, for the year was $96,330.29, as will appear from the following statement:

Name.	Class.	Tonnage.	When purchased or built.	Estimated cost or value.
General McDowell	Propeller	160	Nov. 17, 1886	$56,150.00
General Meigs	do	175	May 11, 1892	64,436.43
General Wool *	do	97	Sept. 1, 1883	27,870.80
Monroe	Steam launch	62.36	Nov. 30, 1875	15,200.00
Resolute	Steam tug	70.30	Nov. 14, 1879	17,947.46
Hamilton	Steam launch	37.68	Feb. 1, 1875	7,800.00
Atlantic	Steam tug	60.31	Oct. 15, 1878	13,865.56
Thayer	Steam launch	32.36	Oct. 4, 1874	7,200.00
Belle of the Bay	Sloop	16	July 25, 1882	275.00

Name.	By whom employed.	Where employed.	Amount paid for repairs.	Amount paid for running expenses, including crews' wages.	Total expenses.
General McDowell	Chief quartermaster, Department of California.	San Francisco Harbor	$2,250.58	$21,918.29	$24,168.87
General Meigs	Depot quartermaster.	New York Harbor	3,218.08	14,706.61	17,924.69
General Wool *	do	do	9,749.07	8,568.55	18,317.62
Monroe	Post quartermaster.	Fort Adams, R. I	992.34	3,998.15	4,990.49
Resolute	Quartermaster U. S. Army.	Boston, Mass	1,783.49	9,133.06	10,916.55
Hamilton	Post quartermaster.	Davids Island, New York Harbor.	2,496.50	4,245.20	6,741.70
Atlantic	do	Governors Island, New York.	34.78	9,767.59	9,802.37
Thayer	do	do	2,611.75	856.25	3,468.00
Belle of the Bay	do	St. Francis Barracks, Fla.	None.	None.	None.
Total			23,136.59	73,193.70	96,330.29

* Name changed to *Ordnance* May 26, 1893.

The steamer *Chester A. Arthur*, which was replaced in the service as shown in last year's annual report by the new steamer *General Meigs*, was sold September 21, 1892, after due advertisement, for $4,250.

The sloop *Belle of the Bay*, reported as on hand at St. Francis Barracks, Fla., in the last report of the Quartermaster-General, was sold May 10, 1893, for $31, there being no further use for her by the Quartermaster's Department.

STATEMENT OF CHARTERED VESSELS.

The following is a list of vessels temporarily used at times during the year by charter and hire, showing cost of such service to have been $9,246.54:

Name.	Class.	Tonnage.	When chartered.	Period of service.		Where charter money is payable.
				From—	To—	
Talisman	Propeller	Unknown.	Aug. 25, 1892	Aug. 25, 1892	Aug. 27, 1892	New York City
Loretta M	do	do	Sept. 22, 1892	Sept. 22, 1892	Sept. 22, 1892	do
Leonard Richards.	do	97.70	Sept. 23, 1892	Sept. 23, 1892	Sept. 24, 1892	do
Assistance	do	Unknown.	Sept. 26, 1892	Sept. 26, 1892	Sept. 28, 1892	do
Day Star	Steamer	do	Oct. 9, 1892	Oct. 9, 1892	Oct. 13, 1892	do
Squantum	Propeller	do	Oct. 12, 1892	Oct. 12, 1892	Oct. 12, 1892	do
C. M. Kempland	do	do	Jan. 4, 1893	Jan. 4, 1893	May 6, 1893	do
W. L. Ewing	Steam tug	do	Apr. 27, 1893	Apr. 27, 1893	Apr. 28, 1893	Fort Sheridan, Ill.
Willie C	do	16.03	July 1, 1892	July 1, 1892	June 30, 1893	Fort Barrancas, Fla.
Charles Runyan	do	78.42	Sept. 6, 1892	Oct. 28, 1892	Dec. 9, 1892	Governors Island, N. Y.
E. B. Lane	do	Unknown.	July 1, 1892	July 1, 1892	Aug. 31, 1892	Fort Monroe, Va.
Do	do	do	June 10, 1893	June 10, 1893	June 30, 1893	Do.
Ajax	Scow	do	Dec. 3, 1892	Dec. 3, 1892	Dec. 3, 1892	Fort Preble, Me.
Vigilant	Steam tug	88	Oct. 20, 1892	Oct. 21, 1892	Oct. 28, 1892	San Francisco, Cal.

Name.	By whom employed.	Rate of pay.	Total earnings.	Remarks.
Talisman	Depot quartermaster.	$50 per day	$150.00	Substitute in place of General Meigs, under repair.
Loretta M	do	$35 per day	65.00	Substitute in place of General Wool, under repair.
Leonard Richards.	do	$43 per day	86.00	Do.
Assistance	do	$43 per day	129.00	Do.
Day Star	do	$200 per job $300 per day	200.00 600.00	Transporting troops from Fort Adams, R. I., to Fort Columbus, New York Harbor, and return and to various points in New York Harbor during Columbian celebration.
Squantum	do	$200 per day	200.00	Transportation of troops to various points in New York Harbor during Columbian celebration.
C. M. Kempland	do	$25 per day	3,075.00	Substitute in place of General Wool, under repair.
W. L. Ewing	Post quartermaster.	$75 per day	150.00	Employed in connection with repair of waterworks.
Willie C	do	$200 per month	2,400.00	Carrying passengers and freight between Forts Pickens, Barrancas, and Pensacola, Fla.
Charles Runyan	do	$6 per hour	1,260.00	Placing targets at Forts Hamilton and Wadsworth, N. Y.
E. B. Lane	do	$3.50 per hour	407.16	Employed setting targets.
Do	do	$2.50 per hour	39.38	Do.
Ajax	do	$25 per job	25.00	Moving ordnance and ordnance stores from Fort Scammel to Fort Gorges, Me.
Vigilant	Chief quartermaster, Department of California.	$70 per day	490.00	Employed as substitute for the steamer General McDowell.
Total earnings.			9,246.54	

TELEGRAPHING ON ARMY BUSINESS.

The Western Union Telegraph Company has continued to transmit all messages on official military business committed to it during the

year. At present date its accounts for this service have not been presented for payment.

Such payments as have been made to the company during the year for telegraphic service rendered in the two preceding fiscal years have been at rates fixed by the Postmaster-General, and have been accepted by the telegraph company under the form of protest recognized by the accounting officers of the Treasury and published in the last report of the Quartermaster-General. The accounts of the company are payable at these rates upon presentation, accompanied by the original telegrams, by any of the several officers designated to settle telegraph accounts in the military departments or at the general depots from which the messages were sent.

ACCOUNTS AND CLAIMS FOR TRANSPORTATION.

The records show that 3,421 accounts and claims, amounting to $467,224.42, were received and examined for settlement in this branch during the year.

Of these, 567, amounting to $78,141.46, were chargeable to the appropriation for Army transportation for the several years in which the services were performed; 1,444, amounting to $340,805.86, were for transportation over the bond-aided Pacific railroads, their leased lines, and branches; 1,242, amounting to $33,102.70, exclusive of 518 accounts of the bond-aided Pacific roads, amounting to $67,867.47, were for transportation for other departments and payable by the several departments interested; and 168, amounting to $15,174.40, were for the transmission of telegrams on official military business, principally over bond-aided Pacific railroads, and chargeable to the appropriation for incidental expenses.

REGULAR SUPPLIES BRANCH.

This branch has charge of all matters relating to the procurement and distribution of supplies, including means of transportation, stoves and heating apparatus, and repair and maintenance of same, for heating barracks and quarters; of ranges, stoves, and apparatus for cooking; of fuel and lights for enlisted men, guards, hospitals, storehouses and offices, and for sales to officers; of equipment of bakehouses to carry on post bakeries; of the necessary furniture, text-books, paper, and equipments for the post schools; for the tableware and mess furniture for kitchens and mess halls for enlisted men; of forage and bedding for the public animals of the Quartermaster's Department, and for the authorized number of officers' horses; of straw for soldiers' bedding; of stationery and blank books for the Quartermaster's Department, certificates for discharged soldiers, blank forms for the paymaster's and quartermaster's departments, and of the necessary correspondence connected with the work of this branch.

This branch has also charge of matters relating to all contracts to which the Quartermaster's Department is a party.

Cavalry and artillery horses purchased (by department or post).

For what department, depot, or post.	Cavalry.	Artillery.	Total cost.	Average cost.	Where purchased.
Department of Dakota	230	.....	$21,089.00	$91.69	In department.
Department of the East	26	22	7,264.50	151.34	Chicago, New York, and Boston.
Department of California	16	18	5,505.00	161.91	In department.
Department of the Missouri	132	34	22,907.00	137.99	Chicago and Fort Riley.
Department of Texas	121	9	16,681.95	128.32	In department.
Department of the Platte	181	.....	19,961.00	110.28	Do.
Department of Arizona	158	.....	22,538.00	142.65	St. Louis and Chicago.
Department of the Columbia	22	.....	2,729.10	124.05	In department.
West Point	6	.....	840.00	140.00	Chicago.
Total	892	83	119,515.55	122.58	

Average cost of cavalry horses	$119.02
Average cost of artillery horses	109.86

Mules and team horses purchased.

For what department, depot, or post.	Horses.			Mules.		
	Number.	Total cost.	Average cost.	Number.	Total cost.	Average cost.
Department of Dakota	2	$300.00	$150.00	90	$15,724.60	$174.72
Department of the East	7	1,198.00	171.14	18	2,994.00	166.33
Department of California	1	245.00	.....	30	4,810.00	160.33
Department of the Missouri	4	675.00	168.75	80	13,619.00	170.23
Department of Texas	.....	.....	.....	41	6,287.40	153.35
Department of the Platte	2	375.00	187.50	100	16,146.20	161.46
Department of Arizona	.....	.....	.....	154	24,576.00	159.58
Department of the Columbia	.....	.....	.....	35	5,898.00	168.51
San Francisco depot	2	475.00	237.50	.....	.....	.....
Philadelphia depot	1	185.00	.....	.....	.....	.....
Washington depot	6	1,215.00	202.50	.....	.....	.....
Burlington, Vt.	1	150.00	.....	.....	.....	.....
Sacketts Harbor, New York	1	150.00	.....	.....	.....	.....
Columbus Barracks	2	425.00	212.50	.....	.....	.....
Davids Island	.....	.....	.....	4	660.00	165.00
West Point	4	660.00	165.00	.....	.....	.....
Total	33	6,053.00	183.42	552	90,715.20	164.34

The following is a statement of the sales of public animals in the different departments and at general and other depots during the fiscal year as reported to this office, showing the number of each class and the total amount realized:

Where sold.	Cavalry and artillery horses.		Draft horses.		Mules.	
	Number.	Amount.	Number.	Amount.	Number.	Amount.
Department of Dakota	93	$2,983.55	3	$94.00	42	$1,227.75
Department of the East	17	767.70	3	77.00	5	165.00
Department of California	42	815.60	1	32.00	12	117.00
Department of the Missouri	193	6,734.40	2	49.50	27	1,164.00
Department of Texas	93	2,309.84	.....	.....	45	1,229.05
Department of the Platte	109	2,849.50	.....	.....	50	1,494.44
Department of Arizona	171	3,947.15	.....	.....	87	2,458.60
Department of the Columbia	33	539.50	4	22.00	4	30.75
San Francisco depot	.....	.....	2	44.50	.....	.....
Jeffersonville depot	.....	.....	1	75.00	1	10.00
Philadelphia depot	.....	.....	1	73.80	.....	.....
Washington depot	14	735.50	1	20.00	3	180.00
Atlanta, Ga	.....	.....	1	26.13	.....	.....
Columbus Barracks, Ohio	.....	.....	1	16.00	.....	.....
West Point, N. Y	5	131.00	1	10.00	3	77.00
Frankford Arsenal, Pennsylvania	1	51.00	.....	.....	.....	.....
Total	771	21,864.74	21	539.93	279	8,063.59

The following is a summary of the number of animals purchased, sold, died, etc., during the fiscal year and remaining on hand at its close, as indicated by reports received at this office:

	Cavalry and artillery horses.	Team horses.	Mules.
On hand July 1, 1892	6,580	288	3,815
Purchased	975	33	552
Total to be accounted for	7,555	321	4,367
Sold	771	21	279
Died	137	6	106
Lost and stolen		1	1
Total sold, died, etc	908	28	386
On hand July 1, 1893	6,647	293	3,981

WAGONS, CARTS, ETC.

During the fiscal year ended June 30, 1893, there were purchased:

Kind.	Number.	Cost.	Kind.	Number.	Cost.
Buckboards	8	$849.00	Wagons:		
Bobsleds	10	495.00	Express	1	$249.25
Carts:			Freight	1	251.00
Coal	3	240.00	Market	1	175.00
Dump	37	1,340.64	Spring	4	822.65
Hand	103	1,492.50	Sprinkling	3	1,063.63
Horse	4	190.00	Transfer	1	300.00
Hose	3	178.00	Water	2	630.00
Mail	1	49.50	Wagonettes	2	745.00
Mule	5	265.00	Water tanks	2	148.00
Sanitary	10	2,100.00	Wheelbarrows	136	519.76
Sleighs	1	51.80	Total		12,155.73

ILLUMINATING SUPPLIES.

During the fiscal year 2,075 lamps (pendent and bracket), 911 lanterns (assorted), 29 lamp-posts, 497 street lamps, 19 lamps (assorted), and the necessary chimneys, wicks, and the various parts required for expenditure and repairs were purchased at general depots at a cost of $17,248. Five hundred and seventy-seven thousand two hundred and five gallons of mineral oil were purchased at a cost of $78,350.46. Twenty-three thousand one hundred and thirty-one gallons of gasoline were purchased at a cost of $3,015.45. Expenditure for gas and matches, $7,210.21. The aggregate expenditure on account of said illuminating supplies was $105,824.12.

The money received from sales of illuminating supplies to officers reverts to the appropriation for regular supplies.

VETERINARY SUPPLIES.

During the fiscal year veterinary supplies were purchased as follows: New York depot, $3,875.77.

CONTRACTS.

During the fiscal year ended June 30, 1893, 1,296 contracts were received, examined, and filed in this office. Seven hundred and six were for 69,580 cords of wood, 161,492,154 pounds of coal, 13,710 bushels of charcoal, 10,164,900 pounds of corn, 31,278,448 pounds of oats, 4,476,000 pounds of barley, 4,120,860 pounds of bran, 68,505,916 pounds of hay, 9,916,000 pounds of straw, 30,000 pounds of middlings, 30,000 pounds of shorts; 2 for indefinite quantities of fuel, forage, and straw; 67 for transportation; 27 for water and water supply; 8 for printing; 56 for leases; 16 for services; 8 for shoeing public animals; 2 for meals, lodgings, and stablings; 78 for buildings; 162 for clothing, camp, and garrison equipage; 1 for packing boxes; 2 for illuminating gas; 1 for lumber for miscellaneous purposes; 9 for telephones; 5 for sewerage; 3 for wells; 14 for heating apparatus; 3 for building material; 19 for plumbing, etc.; 2 for work in national cemeteries; 7 for repairs to buildings; 6 for repairs to steamers; 1 for barrels; 21 for horses; 1 for tableware; 1 for lockers; 2 for gas piping; 7 for mineral oil; 1 for repair of wharf; 1 for rostrum; 1 for removal of soldiers' remains; 10 for roads and sidewalks; 1 for lamp chimneys; 1 for lamps; 9 for mules; 4 for cooking apparatus; 1 for typewriting machines; 1 for cloth examining and measuring machine; 1 for grading; 3 for stoves and ranges; 1 for stove and range parts; 2 for carts, wheelbarrows, etc.; 3 for wagon parts; 2 for flagstaffs; 1 for wire-fence inclosure; 1 for earth filling; 1 for steel bridge; 1 for sea wall; 1 for gasoline; 1 for rubber hose, etc.; 1 for stone flooring; 1 for parchment and printing of soldiers' discharges; 1 for right of way; 1 for tablets, gun carriages, etc., Gettysburg battlefield; 1 for tinners' supplies; 1 for pasteboard boxes; 2 for books.

Stoves and ranges, and extra parts therefor, were purchased at general depots during the fiscal year to extent of $68,928.25, as follows:

Kind.	Number.	Total cost.
Cooking stoves	166	$3,373.20
Heating stoves	444	8,495.56
Laundry stoves	35	318.00
Ranges	213	13,378.59
Furnaces and heaters	32	5,155.00
Andirons, pairs	120	465.00
Furnaces and heating apparatus	.....	5,699.05
Cost of repairs of stoves, etc	.....	32,049.85
Total	.....	68,928.25

Horse and mule shoes, horseshoe nails, and shoeing tools were purchased during the year as follows:

Articles.	Pounds.	Total cost.
Horseshoes	139,050	$5,905.87
Mule shoes	53,675	2,422.04
Horseshoe nails	24,100	2,761.87
Toe calks	1,080	68.81
Shoeing tools	.....	73.68
Total	.....	11,232.27

The following-described articles of tin and sheet-iron ware were, under authority of the Secretary of War, manufactured at the Fort Leavenworth military prison during fiscal year ending June 30, 1893:

Furniture for stoves and ranges.

Articles.	Number.	Material.	Civilian labor.	Prison labor.	Total cost.
Boilers:					
Wash (army range)	557	$537.66	$117.10	$70.03	$724.79
Coffee (army range)	128	49.83	29.46	16.00	95.29
Square	1,098	1,253.85	372.94	213.18	1,839.97
Round	380	445.88	145.25	83.93	675.06
Wash	30	30.98	10.31	5.63	46.92
Coffee	114	52.61	15.98	10.82	79.41
Vegetable and rice	28	14.84	5.83	3.00	23.67
Bake pans:					
Army range	177	41.29	16.65	10.58	68.52
Sheet iron	702	179.84	54.87	32.43	267.14
Tea kettles (army range)	541	194.99	80.04	44.75	319.78
Steamers:					
Army range	24	3.69	2.27	1.50	7.46
Square	59	30.77	12.65	7.00	50.42
Pots:					
Coffee	390	56.82	57.54	34.75	149.11
Tea	32	4.88	2.35	1.38	8.61
Pot covers (army range)	111	8.95	3.03	1.81	13.79
Pans:					
Dish	78	33.03	7.26	5.27	45.56
Tin and sauce	40	11.51	3.98	2.36	17.85
Dippers	170	19.55	19.74	10.99	50.28
Stewpans	24	3.83	1.45	.75	6.03
Stovepipe (joints), common	11,770	1,120.52	124.56	77.50	1,322.58
Stovepipe (elbows), common	1894	135.35	82.60	59.41	277.36
Stovepipe (T-joints), common	30	3.02	3.86	1.68	8.56
Stovepipe (taper joints), common	193	22.34	2.40	2.03	26.77
Stovepipe (joints), Russia	3	1.32	.07	.03	1.42
Stovepipe (elbows), Russia	1	.24	.07	.03	.34
Stovepipe (elbows) taper, common	50	5.82	2.41	2.24	10.47
Stovepipe (collars)	919	34.97	11.56	10.28	56.81
Flue stoppers	136	5.71	3.04	2.83	11.58
Flue thimbles	40	1.01	.80	.50	2.31
Drums, Russia iron	6	12.29	1.61	1.50	15.40
Camp stoves	3	23.65	8.32	5.50	37.47
Total					6,260.73

HARNESS.

Under authority of the Secretary of War, harness was manufactured at Fort Leavenworth Military Prison for the Quartermaster's Department during fiscal year ending June 30, 1893, as follows, viz:

Articles.	Number.	Material.	Civilian labor.	Prison labor.	Total cost.
Single sets harness:					
Ambulance, lead	273	$2,782.95	$346.33	$539.33	$3,668.61
Ambulance, wheel	275	3,066.63	452.78	825.00	4,344.41
Wagon, lead	10	82.53	5.19	5.00	92.72
Wagon, wheel	38	538.54	80.91	79.33	698.78
Light ambulance, wheel	12	104.56	45.76	27.00	177.32
Express, wheel	12	235.84	50.85	30.00	316.69
Sets harness:					
Cart	128	1,751.27	58.32	144.00	1,953.59
Extra parts for same		687.28	89.99	91.33	868.60
Aparejos and pack saddles repaired	136	1,719.81	69.87	73.50	1,863.18
Total					13,983.90

The following are the payments made by quartermasters for purchases for the Army at general depots for use thereat and for shipment

elsewhere during the fiscal year ending June 30, 1893, from appropriations pertaining to that period:

Depots.	Regular supplies.	Incidental expenses.	Barracks and quarters.	Army transportation.	Total.
New York	$67,750.58	$7,329.22	$250.30	$26,559.28	$101,889.38
Philadelphia	4,301.82	100.80	318.59	1,336.04	6,057.25
St. Louis	8,687.21	4,973.06	277.53	87,396.78	101,334.58
Jeffersonville	87,585.56	17,036.96	649.05	39,539.19	144,810.76
San Francisco	17,574.86	2,643.03	5,428.51	16,296.07	41,942.47
Total	185,900.03	32,083.07	6,923.98	171,127.36	396,034.44

Purchases have been made in the departments and at general depots for post bakeries, schools, and gardens, as follows:

Bakeries	$426.77
Schools	3,012.46
Total	3,439.23

Total cost of all tableware and kitchen utensils purchased, Philadelphia depot, $4,359.96.

MESS TABLES, BENCHES, STOOLS, COMPANY FIELD DESKS, AND ROPE MATS.

There were manufactured during the fiscal year ended June 30, 1893, at Fort Leavenworth Military Prison, viz:

Articles.	Number.	Material.	Prison labor.	Total.
Mess tables	174	$790.94	$79.50	$870.44
Mess stools	1,594	478.27	45.00	523.27
Company field desks	14	78.29	20.50	98.79
Rope mats	71	15.40	44.75	60.15
Total				1,552.65

TYPEWRITING MACHINES.

During the fiscal year 25 typewriting machines were purchased at a cost of $67.50 each.

Very respectfully,

A. S. KIMBALL,
Major and Quartermaster, U. S. Army.

The QUARTERMASTER-GENERAL, U. S. ARMY.

8.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., July 27, 1893.

GENERAL: I have the honor to submit a report of the operations of the mail and record divison, the records, files, and miscellaneous claims branch, and the claims branch; also the conducting of fuel tests, for the year ending June 30, 1893.

MAIL AND RECORD DIVISION.

This division was established November 15, 1890, for the purpose of bringing into one division all matters pertaining to the keeping of the records, the briefing, entering, and indexing of all communications received in the office of the Quartermaster-General, as well as the writing and mailing of all letters and indorsements to be sent out. This work was formerly divided among the various branches of the office. To accomplish the consolidation of the records a modification of the card system was adopted.

Under the present system the amount of business of the Quartermaster-General's Office is dispatched with more promptness and with better supervision than was possible under the old methods when each branch kept its own record.

The advantages of the consolidated card record are shown to be many: It prevents duplication of action; it gives the officer or clerk acting upon a communication the full record of all previous action had in connection therewith, whether such action was in branches under his control or not, and the ease with which the full record is furnished results in its always accompanying the case while undergoing action in any of the branches. This affords opportunity for intelligent consideration which could not obtain where one is dependent for the history of a case upon memoranda from book entries, press copies of letters sent and previous briefs, with the uncertainty that all has been obtained.

The apprehension expressed at the time this division was first established that the card index, while successfully applied in the Record and Pension Division of the War Department, which deals mostly with names, would not prove practicable in an office dealing with such a diversity of subjects as does the Quartermaster-General's Office, seems to have been entirely unwarranted, for now when well into the third year of its application cases are quite as readily found as they were when the index was started. This is due to the fact that with the increased number of cards there has been a corresponding increase in the number of subdivisions in the index.

During the past year the work in the various branches has generally been kept well up to date, it having been necessary in but few instances to call attention to cases where action was seemingly unnecessarily delayed.

The following is the number of communications received, and number of letters and indorsements sent out during the year ending June 30, 1893:

Original cases	17,024
Received-backs	21,120
Letters and indorsements mailed	42,659

The decrease in number of original cases, and the increase in number of received-backs as compared with the last report, are due to entering more matter on one card than formerly, especially in work pertaining to branches B and C. Now all correspondence relating to an officer's money accounts for a fiscal year is borne on one card, all correspondence relating to his returns of quartermaster's stores on one card, and all correspondence relating to his returns of clothing and equipage on one card.

RECORDS, FILES, AND MISCELLANEOUS CLAIMS BRANCH.

This branch has the custody of the records and files of the office from the date of its organization, June 15, 1818; investigates and

takes administrative action upon miscellaneous claims and accounts arising from services rendered in the Quartermaster's Department by mechanics, teamsters, and laborers, and for extra-duty pay to enlisted men thus employed; for reimbursement to officers, enlisted men, and civilian employés for expenses incurred for which the appropriations of the Quartermaster's Department are liable; for the expenses of interment of deceased officers and soldiers; rewards for the apprehension and delivery of deserters, for the recovery of lost and stolen public animals, and such other miscellaneous expenditures as do not specifically pertain to other branches of the office.

It also has charge of the supply to the military post libraries of current newspapers and periodicals for the use and benefit of the enlisted men of the Army, and of the printing and binding for the Quartermaster's Department.

Examinations and reports upon inquiries from the Pension Office and other departments and bureaus of the Government, of the services of vessels, and their officers and crews, employed during the late war of the rebellion, are made in this branch, which has the custody of the records pertaining to the services in the War Department of the vessels, armed and unarmed, during the late war.

MISCELLANEOUS CLAIMS AND ACCOUNTS.

There were on hand at the beginning of the fiscal year 59 miscellaneous claims and accounts amounting to $12,857.33; there were received during the year 489 claims and accounts, amounting to $95,034.67. The total number on hand and received was 548, amounting to $107,892. Of these, final action was taken upon 535, amounting to $103,961.04, leaving the number on hand awaiting action at the close of the fiscal year 13 claims and accounts, amounting to $3,930.96.

The following is a detailed statement of the number and amount of claims and accounts on hand and received, and the disposition of those finally acted upon during the fiscal year:

	Number.	Amount.
On hand July 1, 1892, which had previously been suspended, or had not received decisive action:		
Claims, 47, amounting to $9,902.90		
Accounts, 12, amounting to $2,954.43	59	$12,857.33
There were received during the fiscal year:		
Claims	316	77,505.55
Accounts	173	17,529.12
Total on hand and received	548	107,892.00
Final action was taken during the fiscal year as follows:		
Claims approved	3	121.53
Claims referred to other departments	16	3,480.60
Claims referred to Third Auditor for action of accounting officers	206	27,376.80
Reduction on claims approved and referred		17,311.64
Claims rejected	129	35,277.88
Accounts approved	145	10,722.13
Reduction on accounts approved		274.41
Accounts referred to other departments	29	9,033.15
Accounts rejected	7	362.90
Total upon which final action has been taken	535	103,961.04
Remaining on hand July 1, 1893:		
Claims	9	3,840.00
Accounts	4	90.96
Total	13	3,930.96

Action was also taken upon 57 miscellaneous claims, amounting, as presented, to $9,879.70, which pertained to prior years and are not included in the foregoing statement.

The great mass of the claims for pay for services rendered during the late war in the Quartermaster's Department have been presented and disposed of, but such claims are still being received and investigated by this office. The long time which has elapsed since the services were performed for which pay is claimed renders the statements of the claimants as to the dates and places of service, and the names of the quartermasters who employed them, frequently unreliable as a guide to the investigation of their claims, and considerable correspondence and patient search is often required to enable this office to finally dispose of such cases.

NEWSPAPERS AND PERIODICALS.

Current reading matter has been supplied to 111 military post libraries during the fiscal year at a cost of $3,572.35. These posts were garrisoned by 395 companies and detachments of troops. To these were supplied 180 daily, 616 weekly and semiweekly, and 214 monthly publications, selections being made from a list of all the popular current newspapers and periodicals published in this country.

PRINTING AND BINDING.

During the fiscal year 462 requisitions were issued on the Public Printer for printing and binding for the Quartermaster's Department. Of this number 222 were filled in the office of the Public Printer, and 240 were filled in the War Department branch printing office.

The cost of printing and binding during the year, as shown by the bills and estimates thus far rendered to this office, is $10,020.39.

CLAIMS BRANCH.

This branch has charge of claims presented under the act of Congress approved July 4, 1864, for quartermaster's stores taken and used by the Army during the late war of the rebellion in States not in insurrection.

The presentation of this class of claims has been barred since January 1, 1880, under provisions of the act of Congress approved March 3, 1879.

A large number of claims which have been investigated and rejected by the Quartermaster-General for want of proof as to loyalty of the claimants or sufficient evidence that the stores charged for were actually taken and used by the Army are on file in this office.

The act of Congress approved March 3, 1883, authorizes the Court of Claims to further investigate these claims and report the facts ascertained to the committee or to either House of Congress. During the year evidence in 329 of these claims has been furnished by this office in answer to calls from the Court of Claims and Department of Justice.

Upon an examination of the files of the office it is ascertained that the statement contained in the last annual report as to the number and amount of claims on hand at the beginning of the fiscal year is erroneous.

There were on hand July 1, 1892, awaiting action, 99 claims amounting to $121,118.37; 1 claim amounting to $100 was rejected during the year,

leaving on hand awaiting final action at the close of the fiscal year 98 claims amounting to $121,018.37.

Final action upon these claims is suspended for various reasons; in some cases the evidence is incomplete, in others the claimants have died or their whereabouts are now unknown.

CONDUCTING OF FUEL TESTS.

In the supply of fuel to the Army, the standard unit of allowance is the cord of standard oak wood.

Coal is the fuel most generally supplied, and in order to fix the amount that may be issued to troops, or sold to an officer, in lieu of a cord of oak wood, it is essential that the value as fuel of the particular coal in being issued or sold be known. To establish the value of the various coals is equally necessary in order that in making contracts for the supply of coal award in every instance may be made to the lowest responsible bidder for the best and most suitable article, as required by law.

These fuel tests have been conducted during the past year under the immediate supervision of the Quartermaster-General's office.

The coals tested during the year, with the number of pounds of each required to equal 1 cord of standard oak wood, are as follows:

Name.	Where mined.	Rating.
		Pounds.
Deer Creek	Near Glenrock, Converse County, Wyo	2,878
Duckenfield	Australia	1,949
Dunsmuir Wellington	Wellington Colliery, Departure Bay, British Columbia	2,260
Alta mine	45 miles from Tacoma, King County, Wash	2,041
Park Coal and Coke Co	Horr, Mont., 10 miles from Fort Yellowstone	1,873
Red Lodge	Near Red Lodge, Mont	2,839
Streator washed nut	Near Streator, Ill	3,076
Hocking Valley nut	On line of T. and O. C. R. R., Athens County, Ohio, mine No. 21.	2,971
New Kentucky nut	Near Murphysboro, Jackson County, Ill	2,477
Spring Valley nut	Near Spring Valley, Ill	2,751
Lyford nut	Near Lyford, Ind	3,015
Girard nut	Near Girard, Macoupin County, Ill	2,840
Newcastle	King County, Wash., about 21 miles from Seattle	2,886
Franklin mine (McKay vein)	Near Franklin, King County, Wash. (32 miles from Seattle, on line Columbia and Puget Sound R. R.).	2,306
Gilman	Near Gilman, Wash. (42 miles from Seattle, on line of Seattle, Lake Shore and Eastern R. R.).	2,837
New Wellington	Vancouver Island, Departure Bay, British Columbia	2,191
Roslyn bituminous	Near Roslyn, Wash	2,436
Rouse bituminous	Rouse mine, Huerfano County, Colo	2,294
Cardiff bituminous	Wales	1,885

Very respectfully,

W. S. PATTEN,
Captain and Assistant Quartermaster, U. S. Army.

The QUARTERMASTER-GENERAL.

9.

REPORT OF CAPT. C. P. MILLER, ASSISTANT QUARTERMASTER, U. S. ARMY.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., July 14, 1893.

GENERAL: I herewith respectfully submit my report of the operations of the barracks and quarters branch of this office during the past fiscal year:

Under the head of barracks and quarters Congress provided by the act making appropriations for the support of the Army, approved July 16, 1892		$700,000.00
Authorized for construction and repairs	$570,828.87	
Authorized for rent and labor	127,875.79	
		698,704.66
Balance June 30, 1893		1,295.34

NEW CONSTRUCTIONS.

There has been authorized during the year from the appropriation for barracks and quarters for the erection of public buildings at different military posts, consisting of barracks, officers' quarters, storehouses, stables, etc., the sum of $341,524.29.

For the construction and repair of hospitals at military posts already established and occupied there have also been authorized from the appropriation for that purpose expenditures amounting to $49,800.14, and for the construction and repair of hospital stewards' quarters at military posts already established and occupied, from the appropriation "for construction of quarters for hospital stewards," $6,921.14.

REPAIRS.

There have been authorized for repairs, alterations, and improvements to public buildings, and for the purchase of building materials and tools at various posts, expenditures amounting to $229,304.58.

The different military departments and depots to which this money has been distributed are shown in the annexed statement:

Recapitulation of the expenditures authorized for construction, repairs, etc., from the appropriation for barracks and quarters, 1892–'93.

Department or depot, etc.	Construction.	Repairs.	Total.
Department of the East	$183,307.79	$60,186.86	$243,494.65
Department of the Missouri	25,908.00	31,663.76	57,571.76
Department of the Platte	11,185.84	25,184.60	36,370.44
Department of Dakota	12,107.85	29,020.91	41,128.76
Department of Texas	36,767.54	12,845.74	49,613.28
Department of California	12,901.88	9,881.95	22,783.83
Department of Arizona	7,326.64	26,770.52	34,097.16
Department of the Columbia	3,216.75	19,431.65	22,648.40
Columbus barracks	4,483.00	3,150.00	7,633.00
Davids Island	15,429.00	2,609.28	18,038.28
Jefferson Barracks	28,890.00	2,861.10	31,751.10
Willets Point		2,078.32	2,078.32
Jeffersonville depot		1,275.00	1,275.00
New York depot		694.00	694.00
Philadelphia depot		957.00	957.00
St. Louis depot		693.89	693.89
Total	341,524.29	229,304.58	570,828.87

The following list shows the different buildings which have been authorized to be constructed at the various posts, the expenditures therefor being included in the foregoing statements under the head of construction:

Post.	Designation.	Material.	Amount authorized.
Department of the East.			
Fort Barrancas	Two bath houses	Wood	$464.93
	Closet building for enlisted men	do	219.37
Fort Columbus	Two double sets officers' quarters	Brick	29,689.00
	One double set officers' quarters	do	14,200.00
Fort Ethan Allen	Two double sets officers' quarters	do	29,000.00
	Guardhouse	do	7,000.00
Governors Island	Coal shed	Wood	7,100.00
Jackson Barracks	Quartermaster's storehouse	do	797.41
Key West Barracks	Mess hall for two companies	do	19,443.00
	Two single sets officers' quarters	do	
	Two privies for new quarters	do	195.75
Madison Barracks	Two double sets officers' quarters	Brick	28,750.00
	Garbage cremator	do	1,500.00
Fort McPherson	Addition to quartermaster's storehouse	do	2,487.00
	Band stand	Wood	524.00
	Conversion of old guardhouse into schoolhouse.	Brick	1,300.00
	Corral fence	Wood	147.65
Fort Monroe	Quartermaster's stable	Brick	6,375.80
	Wagon shed and corral	Wood	1,819.00
	Conversion of Carroll Hall into barracks for two companies.	Brick	1,745.88
Mount Vernon Barracks	Exercise and amusement room	Wood	250.00
Fort Myer	Wagon shed	do	1,856.00
	Coal shed	Brick	3,991.00
	Quartermaster's and commissary storehouse	do	9,480.00
	One double set noncommissioned officers' quarters.	do	3,485.00
	Bakehouse	do	2,787.00
	Blacksmith shop	do	2,800.00
Fort Niagara	Guardhouse	do	5,475.00
Fort Trumbull	Bath house	Wood	425.00
	Total		183,307.79
Department of the Missouri.			
Fort Leavenworth	Two cavalry stables	Brick	22,832.00
	Ambulance shed	do	1,390.00
Fort Reno	Bakery	do	1,686.00
	Total		25,908.00
Department of the Platte.			
Fort Niobrara	L additions to barracks Nos. 9 and 14	Wood	2,890.00
	Fuel sheds and storeroom	do	200.00
	Coal shed	do	2,248.00
Fort Omaha	Privies		273.34
Fort Robinson	Quartermaster's stables	Wood	3,490.00
	Wagon shed	do	890.00
	Root cellar	do	173.50
	School building	do	965.00
Fort Washakie	Reconstruction of ice house		56.00
	Total		11,185.84
Department of Dakota.			
Fort Assiniboine	Coal sheds for barracks and guardhouse	Wood	165.57
	Addition to water-closet building	Brick	160.00
Fort Keogh	Addition to bakery		350.05
	Cavalry stable	Wood	494.99
Fort Meade	Root cellar	do	448.33
Camp Merritt, Mont	Bath house and ice house	do	59.03
Fort Pembina	Company earth closets	do	460.25
	Wagon shed	do	650.00
Fort Yates	do	do	428.58
	Subsistence storehouse	do	7,490.00
	Addition to quartermaster's storehouse	do	1,325.00
Fort Yellowstone	Addition to quartermaster's stable at old post	do	76.05
	Total		12,107.85

Post.	Designation.	Material.	Amount authorized.
Department of Texas.			
Fort Clark	Quartermaster's storehouse	Stone	$10,000.00
Fort Ringgold	Subsistence storehouse	Brick	6,245.00
Fort Sam Houston	Outhouse for band barracks		195.00
	Four double sets noncommissioned staff officers' quarters.	Brick and wood.	12,845.00
San Antonio	Workshops	Brick	3,800.00
	Blacksmith shop	....do	3,400.00
	Addition to stable of department commander		282.54
	Total		36,767.54
Department of California.			
Alcatraz Island	Additions to barracks No. 17	Wood	1,394.00
	Additions to prison kitchen and guardhouse	Brick and wood.	88.04
	Three base-line houses	Wood	129.86
	Wind break	....do	167.84
Angel Island	Dining room and kitchen for company quarters No. 4.	....do	3,598.00
	Raising roofs of company quarters Nos. 1 and 2, one story each.	....do	
	Oil house	....do	
	Dining room and kitchen for company quarters No. 5.	....do	536.04
Presidio of San Francisco	Cellar under subsistence storehouse	....do	465.00
	Coal house at pumping station	....do	1,074.00
	Single set of officers' quarters	....do	3,627.00
	Coal shed, etc., for new quarters	....do	215.00
	Magazine	Brick	1,425.00
	Three plane table shelters	Wood	182.10
	Total		12,901.88
Department of Arizona.			
Fort Grant	Addition to barracks No. 1	Adobe	510.00
	Signal service storehouse	Wood	148.87
	Building for blacksmith shop, etc	Adobe	343.05
	Building for plumber's shop, engine, and boiler.		147.21
Fort Huachuca	Double set of officers quarters	Adobe	4,776.72
	Outhouses for new quarters		150.00
San Carlos	Bakehouse	Adobe	929.44
	Three frame shelters for company offices and storerooms.	Wood	321.35
	Total		7,326.64
Department of the Columbia.			
Boise Barracks	Enlargement of magazine and ordnance storehouse.	Stone and wood.	160.00
	Guardroom for cavalry stable	Wood	131.95
Fort Canby	Enlargement of barracks No. 11	...do	2,743.00
Fort Sherman	Two wood sheds	...do	181.80
	Total		3,216.75
Recruiting stations, depots, etc.			
Columbus Barracks	Changes in officers' quarters Nos. 1, 2, and 3.	Wood and stone.	4,483.00
Davids Island	Commanding officers' quarters	Brick	10,768.00
	Garbage cremator	...do	1,974.00
	Coal shed	Wood	2,687.00
			15,429.00
Jefferson Barracks	Two double sets officers' quarters	Brick	28,890.00
	Total		48,802.00

From the appropriation for regular supplies there was constructed during the fiscal year a granary (stone) at Fort Douglas, Utah. Cost, $3,040.

MILITARY POSTS.

For the construction of buildings at and the enlargement of such military posts as in the judgment of the Secretary of War may be necessary, Congress, in making appropriations for sundry civil expenses of the Government for the fiscal year ending June 30, 1893, provided the sum of $400,000.

The following amounts from the military posts appropriation for 1891–'92 also became available for expenditure within the fiscal year ending June 30, 1893:

Portion of allotment of December 3, 1891, for construction at Fort Wayne	$16,000.00
Allotment of November 10, 1891, for guardhouse at Fort Sam Houston	9,000.00
Balance July 1, 1892	90,820.96
Total	115,820.96
Add appropriation for 1892–'93	400,000.00
Total to be accounted for	515,820.96

The above sum has been apportioned as follows:

Post.	Designation.		Amount allotted.
Fort Brady	Barrack for 2 companies, 2 double sets officers' quarters, 1 single set officers' quarters, 1 single set noncommissioned staff officers' quarters, salary of architect, and miscellaneous expenses.		$52,122.05
Fort Sheridan	Oilhouse, quartermaster's stable and corral, infantry drill hall, extra work on new buildings, salaries, and advertising.		46,569.73
Fort McKinney	2 cavalry barracks, additions to infantry barracks, addition to guardhouse, 1 set noncommissioned staff officers' quarters, and advertising	$31,223.20	
	Contingent fund	18,776.80	
			50,000.00
Fort Ethan Allen	Double barrack, hospital, 2 cavalry stables, bakery, quartermaster's storehouse, scale house, and printing.		77,222.50
Madison Barracks	Additional cost of buildings authorized in 1891–'92, extra work on new buildings, printing and advertising.		13,298.49
Fort Crook	Mess hall, barrack wing for 4 companies, 2 double sets captains' quarters, 2 double sets lieutenants' quarters, guardhouse, quartermaster's and subsistence storehouse, quartermaster's stable, workshop, coal shed, and salaries	$186,123.50	
	Less amount charged to special appropriation for post	98,664.80	
			87,458.70
Fort Bliss	Barracks for 2 companies, outhouse for barracks, 2 single sets captains' quarters, 2 single sets lieutenants' quarters, and miscellaneous expenses.		52,894.02
Fort Sam Houston	Conversion of band quarters into guardhouse, new band quarters, and miscellaneous expenses.		9,403.67
Columbus Barracks	Wagon shed, changes in new officers' quarters, and advertising.		2,523.65
	Miscellaneous expenditures at various posts		3,930.85
	Balance June 30, 1893		120,397.30
	Total accounted for		515,820.96

The character and cost of the buildings authorized during the year at the different military posts and chargeable to the $400,000 referred to in the preceding table are stated below.

The expense of plumbing, heating, and gas piping in the buildings, unless otherwise shown, is chargeable to other appropriations of the Quartermaster's Department.

FORT SHERIDAN, ILL.

Oil storage house No. 88 (brick)	$1,013.00
Quartermaster's stable, No. 80 (brick)	10,854.00
Infantry drill hall, No. 60 (brick)	27,272.00
Corral fence	467.00
Total	39,606.00
Plumbing in quartermaster's stable No. 80	960.00
Plumbing in infantry drill hall No. 60	314.00
Steam heating in infantry drill hall No. 60	548.00

MADISON BARRACKS, N. Y.

The following buildings have been contracted for at this post during the fiscal year ending June 30, 1893, the allotment for the same having been made in the preceding fiscal year:

One double barrack (brick) Two double sets officers' quarters (brick)	$53,791.00
(Of this amount $12,159 is chargeable to the appropriation of $400,000.)	
Plumbing in double barrack and two sets officers' quarters	7,000.00
Heating in two sets officers' quarters	3,050.00
Gas piping in double barracks and two sets officers' quarters	350.00

COLUMBUS BARRACKS, OHIO.

Wagon shed and corral (frame)	$2,350.00
Plumbing and sewer connections	200.00
Total	2,550.00

FORT SAM HOUSTON, TEX.

The following work at this post has been placed under contract during the year, an allotment of $9,000 having been made from the appropriation pertaining to the fiscal year 1891–'92, and applied thereto:

Conversion of band quarters to guardhouse, No. 13	$3,870.00
New band quarters, No. 46 (brick)	5,445.00
Total	9,315.00

FORT M'KINNEY, WYO.

In the act of August 5, 1892, it was provided that not exceeding $50,000 of the sum therein appropriated "may be used for reconstructing" this post. The following work has been authorized under this law:

Two cavalry barracks	$22,800.00
Four additions to infantry barracks with messhall and kitchen	4,200.00
One set of noncommissioned staff officers' quarters	1,275.00
Addition to guardhouse	2,910.00
Total	31,185.00

NEW POST OF FORT BRADY, MICH.

One double set officers' quarters, No. 6 (brick)	$11,161.00
One double set officers' quarters, No. 7 (brick)	10,944.00
One single set officers' quarters, No. 9 (brick)	7,307.50
One barrack wing, No. 12 (brick)	19,420.50
One single set of noncommissioned staff officers' quarters, No. 20 (brick)	2,083.00
Total	50,916.00
Plumbing in officers' quarters, No. 6	823.16
Plumbing in officers' quarters, No. 7	823.16
Plumbing in officers' quarters, No. 9	494.43
Plumbing in barrack wing, No. 12	2,389.51
Plumbing in noncommissioned staff officers' quarters, No. 20	184.95
Total	4,715.21
Heating apparatus in officers' quarters, Nos. 6, 7, and 9	1,125.00
Heating in barrack wing, No. 12	2,169.00
Total	3,294.00

NEW POST OF FORT BLISS, TEX.

One double barrack (brick)	23,777.00
One outhouse for same	2,345.00
Two single sets captains' quarters, Nos. 15 and 16 (brick)	14,387.00
Two single sets lieutenants' quarters, Nos. 13 and 14 (brick)	12,291.00
Total	52,800.00
Plumbing in outhouse for barracks	2,695.00
Plumbing in officers'quarters Nos. 13, 14, 15, and 16	3,028.00
Total	5,723.00

FORT CROOK, NEBR.

Mess hall (brick)	37,792.91
Barrack wing for four companies (brick)	40,726.54
Officers' quarters, double sets, Nos. 3, 4, 5, and 6 (brick), $14,714.03 each	58,856.12
Guardhouse (brick)	11,285.49
Storehouse (brick)	20,352.79
Stable (brick)	5,557.93
Workshops (brick)	4,190.90
Coal shed (frame)	3,537.32
Total	182,300.00

Of this amount $98,664.80 is chargeable to the special appropriation for construction of this post, and $83,635.20 to the appropriation for military posts.

Plumbing in the above buildings	$11,553.30
Steam heating in same	21,361.24
Gas piping in same	635.00
Cooking apparatus in mess hall	2,631.50

FORT ETHAN ALLEN, VT.

The act of August 5, 1892, authorized the establishment of a military post at a point near the northern frontier, provided that suitable land for the purpose should be donated free of cost to the United States.

The requirements of this law having been complied with by donation of the land, the site of the post has been fixed near Essex Junction, Vt. By General Orders No. 21, dated March 13, 1893, this post has

been designated Fort Ethan Allen, after the Revolutionary general of that name.

In addition to the commencement of work on the roads, water supply, and sewer system, the following-described buildings have been placed under contract and are being constructed:

One double cavalry barrack (brick)	$30,600
Two double sets officers' quarters (brick)	29,000
Guardhouse (brick)	7,000
Two cavalry stables (brick)	21,000
Bakehouse (brick)	3,000
Quartermaster's storehouse (brick)	8,500
Scale house (frame)	500
Hospital (brick)	13,500
Total	113,100

Of this sum, $77,100 is to be taken from the appropriation for military posts, and the remainder from barracks and quarters.

Plumbing in barracks	$2,376.33
Plumbing in officers' quarters, two double sets	2,011.00
Plumbing in guardhouse	518.00
Total	4,905.33
Heating in barracks	3,480.62
Heating in officers' quarters	2,453.00
Heating in guardhouse	301.00
Total	6,234.62
Gas piping in barracks	138.05
Gas piping in officers' quarters	215.00
Gas piping in guardhouse	26.00
Total	379.05

PLATTSBURG BARRACKS, N. Y.

In addition to the construction of roads, water supply, and sewer systems, the following buildings have been contracted for at this post:

Barracks for four companies, No. 2 (brick)	$42,000.00
Mess hall and administration building, No. 1 (brick)	38,000.00
Seven double sets officers' quarters, Nos. 7, 8, 9, 10, 11, 12, and 14 (brick)	98,000.00
Guardhouse, No. 4 (brick)	13,400.00
Total	191,400.00

The cost of these buildings is charged to the special appropriation of $200,000 provided by the act of February 7, 1891.

Plumbing in barracks	$6,400.00
Plumbing in mess hall and administration building	1,900.00
Plumbing in officers' quarters	8,400.00
Plumbing in guardhouse	1,032.00
Total	17,732.00
Heating in seven sets officers' quarters	7,210.00
Cooking apparatus in mess hall	3,000.00
Gaspiping in all the buildings	800.00

OMAHA DEPOT, NEBR.

The act of Congress approved August 5, 1892, appropriated $30,000 for the construction of suitable buildings for a military storehouse and offices at the military depot at Omaha. The act of March 3, 1893, pro-

vided $30,000 additional for completing this building, making a total of $60,000.

Proposals for the erection of this building have been received after due public advertisement, and contracts will be entered into at the following figures:

For the construction of the building	$43,500.90
For the plumbing	585.60
For the steam heating	1,331.00
For the gaspiping	123.17
Total	45,540.67

MILITARY POST NEAR LITTLE ROCK, ARK.

The act of Congress approved April 23, 1892, authorized the establishment of an Army post within 10 miles of the city of Little Rock, Ark., upon the city conveying or causing to be conveyed to the United States the fee-simple title to not less than 1,000 acres of land, etc.

The act of August 5, 1892, provided that "$60,000 of the sum therein appropriated may be used, in case the Secretary of War shall regard it necessary for the public interest, to commence the erection of buildings, including hospital, at the military post near Little Rock, Ark., when the conditions of the act of April 23, 1892, have been complied with."

The conditions having been complied with, the site of the proposed post is being surveyed preparatory to the commencement of its construction.

FORT HARRISON, MONT.

The act of May 12, 1892, authorized the establishment of a military post near the city of Helena, Mont., upon the transfer and conveyance to the United States of a good and sufficient title to not less than 1,000 acres of land, without cost, situated at or near the city of Helena, and appropriated $100,000 for the purpose of defraying the expenses of locating said post and of constructing barracks, quarters, hospitals, kitchens, etc.

The act of March 3, 1893, limited the cost of the post to $200,000.

The requirements of the law as to the transfer of the land having been complied with, work of surveying the reservation is now in progress.

RESERVATION OF THE PRESIDIO OF SAN FRANCISCO, CAL.

The following is a report of the condition of the improvements made on the above reservation during the fiscal year ending June 30, 1893:

All the improvements heretofore made give good promise. The trees are making satisfactory progress and are looking well, with the exception of those planted this year, which are not in such a satisfactory condition, owing to the extreme dryness of the early summer, and several long continued spells of hot weather in February and March. It is too soon, however, to report definite results regarding these.

The bamboos planted during the season of 1891–'92, as an experiment, have not proved satisfactory, their growth having been very slow. Some have been transplanted into better ground with better results. In the month of February, 1893, there were purchased 100 giant bamboos (from Japan), which were planted on select and high ground along the creek or overflow from the Tunnel Spring, where, the soil being good and moist, they appear to be doing well.

Upwards of 30,000 seedlings were raised in the nursery during this year.

Severe windstorms during the winter months lifted a number of the largest acacias out of the ground, and some thousands of others were blown over; fences were demolished and the windmills swept away. About 7,000 trees which were more or less damaged were reclaimed, but subsequently, during a storm of greater

magnitude, the wind again lifted a number of those out of the ground and about 50 acacias were totally destroyed.

On June 16 a grass fire occurred west of the footpath leading to Central avenue, which destroyed 4 pine and 7 acacia trees and injured slightly some 79 Cypress and pines. Grass around these trees having been previously cut under orders from this office, further progress of the fire was stayed.

Early in the year 34,000 trees were purchased at a cost of 2½ cents each, and award was made for planting 60,000 at the same price. Bids for plowing and grubbing 80 acres were invited and award made for the work at $10 per acre. Seventy-five acres were planted with 64,374 assorted trees, as follows:

Eucalyptus (own raising)	29,429
Pine	11,615
Cypress	11,615
Acacia	11,615
Giant bamboo	100
Total	64,374

Spaces between trees have been mowed and weeds removed on the road leading to Central avenue gate. Considerable labor has also been expended in removing lupine, which threatened to retard the growth of the younger trees on various parts of the reservation.

During the year about 10,000 of the trees planted in 1891 have been cultivated, and upwards of 100,000 of those planted in 1892. The work of cultivating those planted this spring is now in progress.

It is proposed to raise in the nursery this year 20,000 seedlings (one-half each of eucalyptus and cypress) to fill any losses that may arise during the year. The seed for the purpose has been purchased and sown. A few sequia trees have also been purchased for experimental handling through the nursery. A large quantity of earth having been taken from the nursery in planting trees, it has been refilled with about 100 loads of good earth, teams for hauling which were furnished by the post authorities at the Presidio. Labor was hired for loading and unloading same.

Purchase of material for repair of fences for protection of young trees was made at a cost of $427.32, and the work performed by hired labor.

Expenditures from special appropriations have been made as follows:

From appropriation approved March 3, 1891:

Cultivation of trees planted in 1891–'92	$1,051.50
Repairing windmills at well and on flume	199.52
Total	1,251.02

No balance of this appropriation remains on hand.

From appropriation approved August 5, 1892:

Planting of trees	$1,581.85
Purchase of trees	910.13
Purchase of seed for nursery	11.25
Plowing and grubbing	750.00
Purchase of wire and staples for fencing	136.60
Parchase of lumber for fencing	290.72
Purchase of hoes and handles for cultivating	4.80
Purchase of watering pot for nursery	1.45
Labor, cultivating young trees, repairing fences, etc	1,893.64
Total expenditures	5,580.44
Balance on hand June 30, 1893	739.56
Total funds received from appropriation	6,320.00
Balance not yet received from the Treasury	3,680.00
Amount of appropriation	10,000.00

The honorable Secretary of War having authorized, February 7, 1893 (Quartermaster-General's office 11053), an expenditure of $2,150 from the appropriation for regular supplies for repair of boundary fence of the Presidio Reservation and for painting gates and picket fences at Lombard street and First avenue entrances, the work was done at a cost of $1,983.37.

Under authority from this office of September 15, 1892, a ditch was constructed on the Presidio Reservation to reclaim the marsh west of culvert. This ditch has proved very satisfactory, as it not only reclaims the marsh, but water accumulating above finds its way into it and passes out into the bay at low tide through the flood gates, which have been provided for the purpose.

Expenditures authorized for wharves, roads, walks, grading, bridges, etc., chargeable to the appropriation for Army transportation.

Post, etc.	Roads, walks, grading, and bridges.	Wharves.	Miscellaneous.
Arlington Reservation, Va	$3,000.00		
Fort Adams, R. I	877.70	$135.61	$240.00
Fort Barrancas, Fla		444.01	424.12
Fort Ethan Allen, Vt	20,923.70		805.00
Governors Island, New York Harbor	225.00	14,232.00	
Fort Hamilton, New York Harbor	732.00	407.75	
Jackson Barracks, La	877.00		
Key West Barracks, Fla	3,047.61		300.00
Fort McPherson, Ga	2,575.00		40.00
Madison Barracks, N. Y	10,966.77		35.10
Fort Montgomery, N. Y	21.00		
Mount Vernon Barracks, Ala	33.00		
Fort Monroe, Va		295.00	
Fort Myer, Va	3,309.18		868.87
Fort Niagara, N. Y	291.11		
Fort Ontario, N. Y	47.20		
Plattsburg Barracks, N. Y	6,823.25		
Fort Porter, N. Y	326.00		
Fort Thomas, Ky	350.00		
Fort Trumbull, Conn	220.00		
Washington Barracks, D. C			69.00
Fort Wadsworth, N. Y		216.00	
Fort Wood, New York Harbor		7.50	
Fort Brady, Mich	350.00		150.00
Fort Leavenworth, Kans	138.00		
Fort Sill, Okla	4.50		
Fort Mackinac, Mich	6.75		
Fort Riley, Kans	9,061.54		1,145.97
Fort Sheridan, Ill	17,115.20		350.00
Fort Wayne, Mich	374.00		
Fort Crook, Nebr			74.97
Fort D. A. Russell, Wyo	46.20		
Fort Douglas, Utah	804.66		
Fort Logan, Colo			75.35
Fort Niobrara, Nebr	533.80		
Fort Omaha, Nebr	140.00		
Fort Robinson, Nebr	300.00		116.00
Fort Sidney, Nebr	2.00		
Fort Washakie, Wyo	100.00		
Fort Assiniboine, Mont			142.50
Fort Buford, N. Dak	327.55		
Fort Meade, S. Dak	27.00		
Fort Snelling, Minn	4,702.30		5.12
Fort Snelling ordnance depot, Minn	500.00		
Fort Bliss, Tex	1,107.50		20.25
Fort Sam Houston, Tex	162.00		
San Antonio, Tex	35.00		
Angel Island, Cal			1,884.25
Alcatraz Island, Cal		1,500.40	
Fort Mason, Cal	374.00	350.00	
Presidio of San Francisco	702.25		
Boise Barracks, Idaho	24.00		
Fort Canby, Wash			18.00
Fort Sherman, Idaho	138.80		
Fort Spokane, Wash	90.00		
Vancouver Barracks, Wash	261.00		
Vancouver Depot, Wash		20.00	
Fort Bowie, Ariz	96.00		
Fort Grant, Ariz	46.55		
Fort Marcy, N. Mex	1,229.10		
Whipple Barracks, Ariz	1,540.00		
Fort Wingate, N. Mex	71.50		
Columbus Barracks, Ohio	1,812.00		
Davids Island, New York Harbor	85.75	9,500.00	534.93
Jeffersonville Depot, Ind	30.00		
Jefferson Barracks, Mo	12,588.40		927.00
New York Depot		200.00	
Willets Point, New York Harbor	1,012.00	1,811.88	
Total	110,584.87	29,120.15	8,226.43

"For shelter, shooting galleries, ranges, repairs, and expenses incident thereto," Congress provided $8,000 in the act making appropriations for the support of the Army, July 16, 1892. This sum was apportioned as follows:

Department or station.	Designation.	Amount.
Department of the East	Repairs and flour	$947.33
Department of Dakota	do	465.09
Department of the Platte	do	616.58
Department of the Missouri	do	3,609.17
Department of Texas	do	490.66
Department of the Columbia	do	325.41
Department of California	do	487.12
Department of Arizona	do	617.21
Fort Niagara	Hire of horses, $30; plank walk, $14	44.00
Fort Assiniboine	Target pit	25.00
Fort Grant	Lumber and nails	83.95
Fort Sam Houston	Rent of range at Leon Springs	120.00
	Repairs at same	4d.00
Fort Sheridan	Seed	91.20
Bellevue, Nebr.	Repairs	31.28
Total		8,000.00

HOSPITALS.

In the act making appropriations for the support of the Army for the fiscal year ending June 30, 1893, Congress appropriated $50,000 for construction and repairs of hospitals at military posts already established and occupied, including the extra-duty pay of enlisted men employed on the same. This fund has been disbursed by officers of the Quartermaster's Department on estimates approved by the Surgeon-General of the Army, as follows:

Department and post.	Amount.
Department of the East.	
Fort Adams	$2,474.86
Fort Columbus	690.55
Fort Hamilton	43.50
Jackson Barracks	42.50
Key West Barracks	2,083.24
Madison Barracks	169.30
Fort McHenry	60.08
Fort McPherson	1,068.27
Fort Monroe	87.00
Mount Vernon Barracks	164.70
Fort Myer	49.23
Newport Barracks	3.68
Fort Niagara	151.16
Fort Ontario	142.51
Fort Preble	24.00
Fort Porter	48.94
St. Francis Barracks	320.86
Fort Schuyler	218.46
Fort Thomas	3,594.94
Fort Wadsworth	82.62
Fort Warren	70.04
Washington Barracks	760.18
Total	12,350.62
Department of the Missouri.	
Fort Leavenworth	17.00
Fort Mackinac	28.12
Fort Reno	673.41
Fort Riley	172.99
Fort Sill	1,000.00
Fort Sheridan	6,443.40

Department and post.	Amount.
Department of the Missouri—Cont'd.	
Fort Supply	$31.88
Fort Wayne	49.53
Total	8,416.33
Department of the Platte.	
Fort D. A. Russell	323.01
Fort Douglas	1,778.10
Fort DuChesne	363.52
Fort Niobrara	731.81
Fort Omaha	280.06
Fort Robinson	160.00
Fort Sidney	192.86
Total	3,829.36
Department of Dakota.	
Fort Assiniboine	1,205.67
Fort Buford	105.22
Fort Custer	264.84
Fort Keogh	326.56
Fort Meade	303.52
Camp Merritt, Mont	62.70
Fort Missoula	194.68
Camp Poplar River	58.62
Fort Sully	385.45
Fort Yellowstone	11,611.10
Total	14,518.36

Department and post.	Amount.
Department of Texas.	
Fort Bliss	$9.00
Fort Brown	358.70
Camp Eagle Pass	58.80
Fort Hancock	55.09
Fort McIntosh	1,136.80
Total	1,618.39
Department of California.	
Alcatraz Island	310.50
Angel Island	343.37
Benicia Barracks	50.00
Fort Bidwell	38.00
Presidio of San Francisco	187.04
Total	928.91
Department of Arizona.	
Fort Apache	441.49
Fort Bowie	267.16
Fort Grant	138.44
San Carlos	445.66
Fort Stanton	322.44
Whipple Barracks	541.82
Total	2,157.01
Department of the Columbia.	
Boise Barracks	$331.83
Fort Canby	181.19
Fort Sherman	126.48
Fort Townsend	207.48
Vancouver Barracks	95.84
Total	942.82
Independent posts, etc.	
Columbus Barracks	3,241.11
Davids Island	44.15
Hot Springs army and navy hospital	1,572.77
Jefferson Barracks	29.60
Willets Point	47.75
Total	4,935.38
Miscellaneous expenditures	102.96
Balance June 30, 1893	199.86
Grand total	50,000.00

Included in the foregoing is a new hospital at Fort Yellowstone, together with additions to hospitals at Fort Douglas, Utah, Fort Thomas, Ky., Fort Sheridan, Ill., and Columbus Barracks, Ohio.

HOSPITAL STEWARDS' QUARTERS.

In the army appropriation act of July 16, 1892, Congress also appropriated $7,000 for construction of quarters for hospital stewards at military posts already established and occupied, including the extra-duty pay of enlisted men employed on the same.

This money has been apportioned by the Secretary of War to the posts named below:

Post.	Amount.	Post.	Amount.
Fort Adams	$55.00	Fort Missoula	$28.35
Fort Hamilton	35.00	Fort Pembina	82.76
Jackson Barracks	296.05	Fort Sully	20.52
Madison Barracks	9.00	Fort Yates	61.71
Fort McHenry	50.50	Fort Yellowstone	6.50
Fort McPherson	33.60	Fort Clark	197.74
Mount Vernon Barracks	202.28	Fort McIntosh	533.35
Fort Myer	76.55	Fort Sam Houston	84.98
Fort Niagara	92.86	Benicia Barracks	21.05
Fort Preble	79.89	Fort Mason	28.85
Fort Porter	27.00	Presidio of San Francisco	111.90
Port Schuyler	295.24	Fort Huachuca	204.33
Fort Trumbull	308.00	Fort Stanton	36.75
Fort Warren	208.40	Fort Wingate	70.10
Washington Barracks	149.70	Fort Canby	11.00
Fort Leavenworth	18.02	Fort Sherman	12.00
Fort D. A. Russell	36.83	Fort Spokane	20.66
Fort Douglas	1,656.46	Fort Walla Walla	10.42
Fort Logan	310.69	Columbus Barracks	726.00
Fort Robinson	197.66	Jefferson Barracks	78.00
Fort Sidney	15.13	Willets Point	5.00
Fort Washakie	58.55	Balance June 30, 1893	78.86
Fort Custer	245.13		
Fort Meade	111.63	Total	7,000.00

BOX LOCKERS.

During the year contract has been made by the depot quartermaster at Jeffersonville, Ind., for the construction of 2,800 box lockers, for issue to the enlisted men of the Army, at $1.90 for each locker.

The purchase of lumber to the value of $2,000 has also been made under contract, the material to be stored at that depot until thoroughly seasoned, for future use in the manufacture of lockers.

IRON FLAGSTAFFS.

Contract has been made for the supply of iron flagstaffs of the N. O. Nelson Manufacturing Company's pattern by the depot quartermaster at St. Louis, Mo., for issue to military posts as required, viz: Six iron flagstaffs of 75 feet, at $500 each; three iron flagstaffs of 100 feet, at $525 each.

PURCHASE OF BUILDINGS.

In the army appropriation act of February 24, 1891, Congress appropriated $50,000 "for the purchase by the Secretary of War of buildings erected at permanent army posts by private parties, under proper authority, and which may be suitable and actually necessary for the army service, and at prices to be fixed by the Secretary of War."

Under this provision of law one building at Fort Riley, Kans., was purchased during the past fiscal year at a cost of $350.

Losses by fire.

Post.	Building.	Remarks.
San Antonio depot	Shops and sheds	Destroyed.
Fort D. A. Russell	Packers' quarters	Do.
Jefferson Barracks	Hospital steward's quarters	Do.
Fort Custer	Barracks, No. 21	Destroyed. Building old and comparatively worthless.
Fort Reno	Bakery	Destroyed.
Camp Eagle Pass	Hay sheds, etc	Do.
Fort Robinson	Log barracks	Destroyed. Building old and comparatively worthless.
Fort Yates	Amusement hall used as chapel and schoolhouse.	Destroyed.
	Band barracks	Do.
Fort Meade	Officers' quarters, Nos. 3 and 4	Do.
Fort Buford	Double set officers' quarters, No. 2	Do.
Fort Omaha	Post exchange	Building proper totally and annex partially destroyed.
Fort McKinney	Three cavalry stables, Nos. 36, 37, and 49	Destroyed.
	One cavalry stable building, No. 50, used as barracks.	Do.
Madison Barracks	Hospital	Slightly damaged.
Fort Pembina	Bakery	Considerably damaged.
Fort Thomas	Wagon shed	Do.
Fort Wadsworth	Post quartermaster sergeant's quarters	Do.
Columbus Barracks	Old hospital	Do.
Fort Robinson	Officers' quarters, No. 1	Slightly damaged.
Fort Sherman	Post exchange	Partially destroyed.
Madison Barracks	Officers' quarters, No. 1	Slightly damaged.
Fort Sam Houston	Officers' quarters, No. 42	Damage estimated at $247.

A statement is herewith submitted, marked A, of property rented by the Quartermaster's Department during the fiscal year and the amount of rent paid therefor.

Very respectfully,

C. P. MILLER.
Captain and Assistant Quartermaster, U. S. Army.

The QUARTERMASTER-GENERAL U. S. ARMY,
Washington, D. C.

A.—*Statement showing property rented by the Quartermaster's Department during the fiscal year ending June 30, 1893, and total amount paid, as shown by reports of officers of the department.*

DEPARTMENT OF THE EAST.

Post or station.	Number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Baltimore, Md	Building	Office, quartermaster and subsistence departments.	$50.00	$600.00
	1	Quarters of hospital steward	12.00	17.20
Boston, Mass	8	Offices and storerooms, quartermaster's and subsistence department.	90.00	1,080.00
	2	Office of paymaster	45.83	348.31
Buffalo, N. Y	3	Office of depot quartermaster	62.50	750.00
New Orleans, La	4	Office, quartermaster and subsistence departments.	50.00	600,00
	Floor	Storehouse depot commissary subsistence.	83.33	999.96
Providence, R. I	1	Office, inspector of ordnance	25.00	300.00
Fort Caswell, N. C	1	Quarters for ordnance sergeant	8.00	96.00
Fort McPherson, Ga	Building	Quarters for principal musician	12.00	132.00
Fort Myer, Va	Do.	Quarters for post ordnance sergeant	12.00	144.00
Sacketts Harbor, N. Y	1	Office, constructing quartermaster, Madison Barracks.	15.00	180.00
	Building	Stable and shed for public animals	7.00	10.73
Burlington, Vt	1	Temporary office constructing quartermaster, Fort Ethan Allen.	12.50	49.91
Fort Ethan Allen, Vt	2	Office constructing quartermaster, Fort Ethan Allen.	7.50	19.75
Atlanta, Ga	Building	Office constructing quartermaster, Fort McPherson.	20.00	60.00
	2	Office of quartermaster at Atlanta	25.00	300.00
	2	Office of paymaster	25.00	300.00
Total				5,987.86

DEPARTMENT OF THE MISSOURI.

Chicago, Ill	23	Offices, headquarters department	$1,208.33 1,328.33	$14,979.96
	Building	Office and storehouse for quartermaster's and subsistence departments.	500.00	6,000.00
	Do	Stables for animals, quartermaster's department.	150.00	1,800.00
	9	Quarters for enlisted men, Signal Corps	12.00	431.20
	2	Quartermaster sergeants	12.00	104.80
	1	Sergeant of artillery	12.00	38.80
	7	Hospital corps men	12.00	338.80
	16	Enlisted men, engineer battalion	12.00	383.20
	19	Enlisted men, ordnance department	12.00	633.60
Detroit, Mich	1	Office for paymaster	35.00	274.17
Leavenworth, Kans	1	do	25.00	300.00
Kansas City, Mo	2	Office for subsistence department	50.00	41.67
Fort Sill, Okla	1	Quarters for enlisted men, Signal Corps	12.00	24.00
Fort Sheridan, Ill	7	Office and stable, constructing quartermaster.	20.00	240.00
Little Rock, Ark	1	Office, civil engineer	4.00	4.28
Sault Ste. Marie, Mich	4	Office, constructing quartermaster, New Fort Brady.	30.00	360.00
Total				25,954.48

DEPARTMENT OF THE PLATTE.

Omaha, Nebr	41	Office, etc., for department headquarters	$780.00	$9,360.00
		Lot for stable		500.00
Denver, Colo	5	Offices and storerooms, quartermaster's and subsistence departments.	125.00	1,500.00
Salt Lake City, Utah		Office, paymaster	30.00	360.00
Ogden, Utah		Office and storeroom, quartermaster's agent.	32.00	384.00
Price, Utah	Building	Office and warehouse, quartermaster's agent.	20.00	240.00
		Quarters for detachments and recruits en route.	4.00	17.33
Taylors Ranch, Utah	1	Quarters for signal sergeant	10.00	120.00
		Lodging recruits		5.00
Total				12,486.33

A.—*Statement showing property rented by the Quartermaster's Department during the fiscal year ending June 30, 1893, etc.*—Continued.

DEPARTMENT OF DAKOTA.

Post or station.	Number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Helena, Mont.	3	Office, pay department, and office and storeroom, quartermaster's department.	$50.00	$50.00
	2	Office and storeroom, quartermaster's department.	33.33	366.63
Bismarck, N. Dak	1	Stable, quartermaster's department	10.00	16.67
	1	Quarters, signal sergeant	12.00	49.20
		Lodgings for enlisted men		120.41
Total				602.91

DEPARTMENT OF TEXAS.

San Antonio, Tex.	2	Quarters for two commissary sergeants.	$12.00	$288.00
	1	Quarters for chief musician	12.00	144.00
	2	Quarters for two principal musicians	12.00	288.00
	1	Quarters for sergeant-major	12.00	144.00
	2	Quarters for post and regimental quartermaster sergeants.	12.00	288.00
	1	Quarters for ordnance sergeant	12.00	144.00
	1	Quarters for signal sergeant	12.00	144.00
Fort Bliss, Tex	18	Quarters for officers, enlisted men, and storehouses.	175.00	2,100.00
Eagle Pass, Tex		Camp for one troop of cavalry	75.00	900.00
Fort McIntosh, Tex	1	Quarters for post quartermaster sergeant.	12.00	96.00
Pena Colorado, Tex.	Building	Quarters for officers and enlisted men, and storehouses.	50.00	400.00
Polvo, Tex.	Building and grounds.	Quarters for Seminole negro Indian scouts.	10.00	13.33
Pena, Tex.	1	Office quartermaster's agent	8.00	96.00
Edinburg, Tex.	Building and grounds.	Quarters and storeroom for a detachment.	15.00	180.00
Santa Maria, Tex	do	do		150.00
Presidio, Tex	do	Quarters and storeroom for a detachment of cavalry.	15.00	102.50
El Paso, Tex.		Office, constructing quartermaster, New Fort Bliss.	32.00	384.00
		Stable, constructing quartermaster, New Fort Bliss.	7.50	90.00
Total				5,951.83

DEPARTMENT OF CALIFORNIA.

San Francisco, Cal.	1 floor	Offices, etc., for department headquarters.	$1,000.00 750.00	$11,000.00
		Stabling for public animals, etc	47.00	564.00
	1	Quarters, signal sergeant	12.00	144.00
Total				11,708.00

DEPARTMENT OF ARIZONA.

Albuquerque, N. Mex	2	Offices for paymasters	$45.00	$45.00
Carthage, N. Mex.	1	Quarters, signal sergeant	12.00	144.00
Cooleys, Ariz	1	do	12.00	144.00
Deming, N. Mex		Lodgings for 3 enlisted men		1.50
Fort Marcy, N. Mex	2	Offices for paymasters	20.00	220.00
	1	Quarters, chief musician	9.00	108.00
	1	Quarters, principal musician	7.00	84.00
	1	do	10.00	120.00
	1	Quarters, commissary sergeant	10.00	128.80
	1	Quarters, sergeant-major	11.00	121.13
	1	Quarters, regimental quartermaster sergeant.	9.00	108.00
Holbrook, Ariz	1	Quarters, signal sergeant	12.00	144.00

A.—*Statement showing property rented by the Quartermaster's Department during the fiscal year ending June 30, 1893, etc.*—Continued.

DEPARTMENT OF ARIZONA—Continued.

Post or station.	Number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Los Angeles, Cal	49	Headquarters, Department of Arizona	$635.00	$7,620.00
	Building	Stables for quartermaster's department	30.00	360.00
	1	Storeroom, quartermaster's department	15.00	180.00
	1	Quarters, commissary sergeant	12.00	144.00
	2	Quarters, signal sergeants	12.00	288.00
	1	Storeroom for quartermaster's department.	4.00	4.00
	1	Office, acting assistant surgeon	12.50	12.50
		Lodgings for 37 enlisted men		27.50
San Diego Barracks, Cal.	Building	Hospital	75.00	900.00
	16	Officers' quarters	12.00	2,224.00
Willcox, Ariz	1	Quarters, signal sergeant	12.00	144.00
		Lodgings for 6 enlisted men		3.00
Total				13,275.43

DEPARTMENT OF THE COLUMBIA.

Portland, Oregon	6	Offices, chief paymaster and depot quartermaster.	$70.00	$840.00
	1	Office, subsistence department	46.00 32.00	454.00
	1	Storeroom, quartermaster's department	60.00 38.00	566.00
Walla Walla, Wash	1	Office, paymaster	30.00	360.00
In the field		Headquarters, storehouses, barracks, stables, and hospital.		194.42
		Camp grounds		100.00
		Lodgings for enlisted men		87.00
Total				2,601.42

GENERAL DEPOTS OF THE QUARTERMASTER'S DEPARTMENT.

New York depot	Building	Stable and carriage house for public animals, etc.	$112.50	$1,350.00
	1	Quarters for hospital steward	14.00	80.26
	1	....do	14.00	101.73
Total				1,531.99
Philadelphia depot	14	Offices, storerooms, stables, etc	179.17	2,150.04
	1	Office, attending surgeon	18.00	216.00
Total				2,366.04
Washington depot	Ground	Stables and storehouse	150.00	1,800.00
	Do	Offices, storerooms, etc., for subsistence department.	8.33⅓	100.00
	Do	....do	25.00	300.00
	1	Quarters for hospital steward	21.00	252.00
	5	Quarters for five signal sergeants	12.00	456.00
		Office for military attaché, Paris, France		162.66
		Office for military attaché, Berlin, Germany.		540.00
		Office for military attaché, St. Petersburg, Russia.		403.20
		Office for military attaché, London, England.		144.00
		Office for military attaché, Rome, Italy		225.00
Total				4,382.86
St. Louis depot	3	Office of subsistence department	100.00	1,200.00
	7	Offices of quartermaster's and pay departments.	216.67	2,600.00
	2	Storerooms of quartermaster's department.		
	Building	Stable of quartermaster's department	30.00	360.00
	Do	Storehouse of medical department	166.67	2,000.00
Total				6,160.00

A.—*Statement showing property rented by the Quartermaster's Department during the fiscal year ending June 30, 1893, etc.*—Continued.

GENERAL DEPOTS OF THE QUARTERMASTER'S DEPARTMENT—Continued.

Post or station.	Number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
San Francisco	Building	Offices and storerooms, medical, subsistence, and quartermaster's departments.	$833.33	$9,999.96
		Quartermaster's storeroom	125.00	1,500.00
		Storage for turpentine, oils, etc., per gallon, $0.00¼; per barrel, $0.15.		651.75
Total				12,151.71

RECAPITULATION.

Departments, etc.	Amount.
Department of the East	$5,987.86
Department of the Missouri	25,954.48
Department of the Platte	12,486.33
Department of Dakota	602.91
Department of Texas	5,951.83
Department of California	11,708.00
Department of Arizona	13,275.43
Department of the Columbia	2,601.42
New York depot	1,531.99
Philadelphia depot	2,366.04
Washington depot	4,382.86
St. Louis depot	6,160.00
San Francisco depot	12,151.71
Total	105,160.86

10.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., July 20, 1893.

GENERAL: I have the honor to submit a report of the operations of the reservation branch of this office for the fiscal year ending June 30, 1893.

The sale of ground at Pittsburg, Pa., authorized by act of May 21, 1890 (Public No. 125), which was pending at the close of last fiscal year, has not been concluded. The depot quartermaster, Washington, D. C., under instructions of this office, has offered the ground for sale at public auction, but as no satisfactory offer was made the sale was not effected.

The purchase of a site for a military post at Eagle Pass, Tex. (Old Fort Duncan), under the provisions of the act of March 3, 1891, has not been concluded. The title papers have been collected and submitted to the Attorney-General, who held that it would be unsafe to accept the deeds in view of the fact that a suit was pending to set aside and vacate the will of John Twohig, deceased, whose executor transferred the property. On the 24th ultimo the department chief quartermaster reported that the suit had been compromised, and asked if the lease should be renewed for the next fiscal year. The department commander recommended renewal of lease with remark that the present

site is not adapted to military purposes and recommendation that authority be given for the selection of a better site. Renewal of lease was authorized, but no further action has been taken as to purchase of site.

The appropriation of $16,500 by act of June 27, 1890 (General Order 69, 1890), for purchase of land for target ranges at Fort McPherson, Ga., still remains unexpended, suitable ground not having been obtained in the vicinity of the post.

Under the provisions of the act of April 23, 1892 (General Order 31), title has been acquired to a tract of about 1,100 acres of land for a military post in Pulaski County, Ark., situated just above the city of Little Rock, Ark., on a bluff overlooking the valley of the Arkansas River. The title has been approved by the Attorney-General and the deed recorded and filed in this office. Jurisdiction ceded by State act of February 25, 1893.

The act under the provisions of which the site was acquired provided that, upon approval and acceptance of said lands (not less than 1,000 acres) by the Secretary of War for an Army post, all the right, title and interest of the United States to a parcel of land in Little Rock known as the "arsenal grounds," containing 36 acres more or less, shall become vested in the city of Little Rock, upon condition that said grounds be forever exclusively devoted to the uses and purposes of a public park for said city. The site was approved and accepted by the Secretary of War February 16, 1893.

Under the provisions of act of May 12, 1892 (Generl Order 84), title has been acquired, free of cost to the United States, to a tract of 1,040 acres of land for a military post in Lewis and Clarke County, near the city of Helena, Mont. The title has been approved by the Attorney-General and the deeds have been referred for record in the office of the recorder of Lewis and Clarke County, Mont. No cession of jurisdiction.

In compliment to the President the post was designated Fort Harrison by the Secretary of War December 13, 1892.

Under the provisions of the act of August 5, 1892 (General Order 58, page 13), authorizing the Secretary of War to establish a military post at a point near the northern frontier, a tract of 600 acres of land, free of cost to the United States, has been acquired in Chittenden County, Vt., the title has been approved by the Attorney-General, and the deeds recorded and filed in this office. The tract is partly in Colchester and partly in Essex townships, 2 miles from Essex Junction and about 5 miles from Burlington. Jurisdiction ceded by State act of November 18, 1892. The post was designated Fort Ethan Allen by General Order 21, March 13, 1893.

A tract of 5.516 acres of land was set aside by letter of the Secretary of the Interior of May 11, 1893, for a hospital site at Fort Yellowstone, Wyo., adjoining the tract of 22.5 acres previously set aside for military purposes.

By authority of the President of May 4, 1893 (G. O. 68), a tract of 700 acres, more or less, was reserved for military purposes on Anastasia Island, contiguous to St. Augustine, Fla. The land is particularly described as follows: The southeast quarter of section 21, all of section 22, the northeast quarter of the northeast quarter of section 28, and all of section 27; all in township No. 7 south, range 30 east.

General Orders affecting military reservations have been published during the year (from September 12, 1892, conclusion of last annual report), as follows:

No. 64, September 13, 1892, under authority of act of June 10, 1892

(Public No. 80), sets apart 20 acres from the northeast corner of the Fort Sidney, Nebr., reservation for use as a public cemetery by the city of Sidney, Nebr.

No. 69, October 4, 1892, by authority of the President of September 29, 1892, transfers to the Interior Department, under act of July 5, 1884, the reservation of Oklahoma, Okla. Area, 160 acres.

No. 70, October 8, 1892, directs the withdrawal of the garrison and the abandonment of Fort Du Chesne, Utah. (No action appears to have been taken under this order.)

No. 74, October 29, 1892, by authority of the President of September 21, 1892, transfers to the Interior Department, under act of July 5, 1884, the reservation at St. Marks, Fla. Area, 50 acres, more or less.

No. 81, December 3, 1892, by authority of the President of November 22, 1892, transfers to the Interior Department, under act of July 5, 1884, the reservation of Fort Thomas, Ariz. Area 10,487 acres.

No. 84, December 14, 1892, publishes act of May 12, 1892, to establish a military post at or near the city of Helena, in Lewis and Clarke County, Mont., and in compliment to the President of the United States designates the post to be established as Fort Harrison.

No. 21, March 13, 1893, designates the military post near Essex Junction, Vt., as Fort Ethan Allen, in honor to the name of the eminent revolutionary patriot whose home was in that vicinity and who at one time owned the land where the post is to be situated.

No. 27, paragraph 6, March 23, 1893, provides that the $100,000 appropriated by act of May 12, 1892, for a military post at Helena, Mont., may be used for beginning the construction, provided that the cost of the improvements and buildings shall not exceed $200,000.

Act March 3, 1893, sundry civil (Public No. 124), authorizes the President by proclamation to withhold from sale and grant for public use to the municipal corporation in which the same is situated all or any portion of any abandoned military reservation, not exceeding 20 acres in one place.

Custodians are still employed and paid by this Department for the care of reservations that have been turned over to the Interior Department, as follows:

	Per month.
Fort Elliott, Tex., D. H. Doty	$60
Oklahoma, Okla., F. M. Given	30
Fort Maginnis, Mont., Emil Plum	No pay.

In addition to the foregoing, custodians are employed and paid by this Department as follows:

Fort Randall, S. Dak., John H. McLaughlin	$60
Fort Union, N. Mex., J. W. Anderson	60
Camp Del Rio, Tex., John Glynn	30
Monterey, Cal., Francis Doud	No pay.

Fort Randall has been abandoned, but upon the request of the Interior Department its transfer to that Department is delayed.

Fort Union and Camp Del Rio have been abandoned, but are not to be transferred to the Interior Department.

Attention is invited to statements A, B, C, and D, accompanying this report.

A shows the expenditures that have been authorized for water, sewerage, plumbing, etc., chargeable to appropriation for Army transportation.

B shows the expenditures that have been authorized for lighting, heating, etc., chargeable to the appropriation for regular supplies.

C is an alphabetical list of the military reservations that have been turned over by the War Department to the Interior Department, or otherwise disposed of by the War Department, since 1858, with date of relinquishment, authority therefor, etc.

D is an alphabetical list of military reservations, showing location, size, how occupied, accommodations for officers, men, etc., on June 30, 1893.

Very respectfully,

OSCAR F. LONG,
Captain and Assistant Quartermaster, U. S. Army.

The QUARTERMASTER-GENERAL U. S. ARMY.

A.—*Expenditures authorized for water, sewerage, plumbing, etc., chargeable to the appropriation for Army transportation for 1892–'93.*

Station.	Amount.
Department of the East.	
Fort Porter, N. Y	$211.68
Fort Niagara, N. Y	2,870.13
Fort Ontario, N. Y	67.50
Madison Barracks, N. Y	57,095.25
Plattsburg Barracks, N. Y	12,107.98
Fort Preble, Me	1,087.82
Fort Warren, Mass	8,537.59
Fort Adams, R. I	1,479.56
Fort Trumbull, Conn	588.89
Fort Hamilton, New York Harbor	1,145.07
Fort Wadsworth, New York Harbor	750.09
Fort Columbus, New York Harbor	5,160.70
Fort Schuyler, New York Harbor	2,365.40
Fort Wood, New York Harbor	30.00
Fort McHenry, Md	787.03
Washington Barracks, D. C	787.72
Fort Myer, Va	32,253.72
Fort Monroe, Va	8,891.47
Fort McPherson, Ga	5,272.43
St. Francis Barracks, Fla	725.96
Fort Barrancas, Fla	22,281.56
Mount Vernon Barracks, Ala	14,681.70
Jackson Barracks, La	3,186.95
Newport Barracks, Ky	88.53
Fort Thomas, Ky	1,896.18
Fort Foote, Md	273.00
Key West Barracks, Fla	2,513.60
Fort Marion, Fla	18.00
Fort Ethan Allen, Vt	38,322.58
Fort Moultrie, S. C	5.00
Total	239,482 09
Department of Dakota.	
Fort Assinniboine, Mont	294.10
Fort Buford, N. Dak	642.91
Fort Custer, Mont	624.96
Fort Keogh, Mont	884.84
Fort Meade, S. Dak	1,581.62
Fort Missoula, Mont	214.08
Fort Snelling, Minn	3,181.55
Fort Sully, S. Dak	474.52
Fort Yates, N. Dak	3,908.42
Fort Yellowstone, Wyo	174.30
Camp Poplar River, Mont	3.05
St. Paul, Minn	2,236.00
Bismarck, N. Dak	25.00
Fort Pembina, N. Dak	512.45
Total	14,757.80

Station.	Amount.
Department of the Platte.	
Fort Logan, Colo	$735.77
Fort McKinney, Wyo	1,280.75
Fort Niobrara, Nebr	4,326.75
Fort Omaha, Nebr	1,622.78
Fort Robinson, Nebr	3,090.29
Fort D. A. Russell, Wyo	1,651.11
Fort Sydney, Nebr	118.52
Fort Washakie, Wyo	126.50
Camp Pilot Butte, Wyo	20.75
Fort Duchesne, Utah	135.44
Fort Douglas, Utah	2,369.80
Fort Crook, Nebr	13,424.30
Total	28,902.76
Department of the Missouri.	
Fort Brady, Mich	7,127.61
Fort Leavenworth, Kans	3,784.59
Fort Mackinac, Mich	95.75
Fort Reno, Okla	9,898.39
Fort Riley, Kans	5,997.47
Fort Sheridan, Ill	20,810.00
Fort Sill, Okla	235.30
Fort Supply, Ind. T	593.92
Fort Wayne, Mich	1,678.42
Chicago, Ill	24.00
Total	50,245.45
Department of Texas.	
Fort Bliss, Tex	6,229.37
Fort Brown, Tex	584.66
Fort Clark, Tex	728.05
Fort Hancock, Tex	99.38
Fort McIntosh, Tex	702.41
Fort Ringgold, Tex	1,749.46
Fort Sam Houston, Tex	3,905.59
San Antonio, Tex	5,308.46
Eagle Pass, Tex	38.90
Total	19,346.28
Department of Arizona.	
Fort Apache, Ariz	388.39
Fort Bowie, Ariz	309.17
Fort Bayard, N. Mex	990.94
Fort Grant, Ariz	6,602.73
Fort Huachuca, Ariz	1,530.98
Fort Marcy, N. Mex	377.86
San Diego, Cal	61.40

A.—*Expenditures authorized for water, sewerage, plumbing, etc.*—Continued.

Station.	Amount.	Station.	Amount.
Department of Arizona—Continued.		*Department of the Columbia*—Cont'd.	
San Carlos, Ariz	$1,255.24	Fort Sherman, Idaho	$405.72
Fort Stanton, N. Mex	6,729.40	Fort Spokane, Wash	1,901.41
Whipple Barracks, Ariz	2,400.32	Fort Townsend, Wash	876.39
Fort Wingate, N. Mex	3,133.61	Vancouver Barracks, Wash	1,489.91
Los Angeles, Cal	22.00	Fort Walla Walla, Wash	496.74
Total	23,802.04	Total	6,590.16
Department of California.		*Independent posts.*	
Presidio of San Francisco, Cal	2,643.61	Jefferson Barracks, Mo	12,124.46
Fort Mason, Cal	330.30	Davids Island, New York Harbor	3,455.54
Fort Bidwell, Cal	22.66	Columbus Barracks, Ohio	5,057.40
Alcatraz Island, Cal	1,793.48	St. Louis Depot, Mo	178.52
Benicia Barracks, Cal	524.23	West Point, N. Y	795.00
Angel Island, Cal	412.37	Willets Point, New York Harbor	3,332.03
Total	5,726.65	Philadelphia Depot, Pa	12.90
Department of the Columbia.		Total	24,955.85
Boise Barracks, Idaho	843.34		
Fort Canby, Wash	576.65	Aggregate	413,809.08

B.—*Expenditures authorized for lighting, heating, etc., chargeable to the appropriation for regular supplies for 1892–'93.*

Station.	Amount.	Station.	Amount.
Fort Adams, R. I	$75.00	Fort Sidney, Nebr	$85.00
Fort Brady, Mich	3,403.15	Fort Robinson, Nebr	15.00
Fort Niagara, N. Y	318.00	Fort Logan, Colo	17.00
Fort Porter, N. Y	220.95	Fort Sherman, Idaho	12.00
Fort McPherson, Ga	222.50	Fort Elliott, Tex	30.00
Fort Thomas, Ky	1,217.75	Columbus Barracks, Ohio	5,480.86
Fort Monroe, Va	564.57	Madison Barracks, N. Y	34,773.35
Fort Myer, Va	34.32	Washington Barracks, D. C	100.52
Fort Hamilton, New York Harbor	930.50	Plattsburg Barracks, N. Y	11,425.00
Fort Schuyler, New York Harbor	340.62	Jefferson Barracks, Ind	2,559.24
Fort Ethan Allen, Vt	6,613.67	Davids Island, New York Harbor	1,903.59
Fort Sheridan, Ill	8,576.73	Willets Point, N. Y	173.02
Fort Snelling, Minn	517.38	Governors Island, New York Harbor	4,098.00
Fort Leavenworth, Kans	1,043.84	Washington Depot, D. C	31.50
Fort Wayne, Mich	80.00	Jeffersonville Depot, Ind	1,083.60
Fort Reno, Okla	25.40	New Orleans, La	20.00
Fort Riley, Kans	3,571.86	Chicago, Ill	19.50
Fort Niobrara, Nebr	60.00	St. Paul, Minn	422.59
Fort Wingate, N. Mex	25.00	Omaha, Nebr	83.80
Fort Vancouver, Wash	400.00		
Fort Bliss, Tex	8,203.05	Total	123,355.60
Fort Crook, Nebr	24,627.74		

C.—*List of military reservations turned over by the War Department to the Interior Department, or otherwise disposed of by the War Department, from 1858 to June 30, 1893, with date of relinquishment, authority therefor, etc.*

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Abercrombie, Fort, Dak	Mar. 25, 1871	Act Feb. 24, 1871	Portion east of the Red River of the North. G. O. 19, A. G. O., 1871.
Do	July 14, 1880	Act June 10, 1880	Reservation abolished. G. O. 55, A. G. O., 1880.
Do		Act July 15, 1882	Reservation abolished. G. O. 85, A. G. O., 1882.
Abraham Lincoln, Fort, N. Dak.	Oct. 15, 1891	Act July 5, 1884	15,040 acres, also Sibleys Island, containing 13,696 acres. G. O. 84, A. G. O., 1891.
Arbuckle, Fort, Ind. T	July 9, 1870	Indian treaty of Apr. 28, 1866.	
Assinniboine, Fort, Mont	Oct. 22, 1891	Act July 5, 1884	Hay reservation, coal reservation, and part of post reservation. Area not stated. G. O. 85, A. G. O., 1891.
Atkinson, Fort, Iowa		Act June 7, 1860	12 Statute, 28.
Austin, Tex		Act Mar. 5, 1888	Arsenal block. For educational purposes only. G. O. 30, A. G. O., 1888.
Baton Rouge Barracks, La	Aug. 22, 1884	Act July 5, 1884	44.17 acres. G. O. 102, A. G. O., 1884.
Do		Act June 12, 1886	By Secretary Interior to State University. G. O. 55, A. G. O., 1886.
Bennett, Fort, S. Dak		Order of Secretary of War of Oct. 3, 1891, G.O. 79, A.G.O., 1891.	On Indian reservation. No formal reservation.
Benton, Fort, Mont	Jan. 5, 1883	Act Aug. 4, 1882	G. O. 110., A. G. O., 1882.
Bidwell, Fort, Cal	Feb. 13, 1885	Act July 5, 1884	Portion, 123.26 acres. G. O. 16, A. G. O., 1885.
Do	Nov. 19, 1890	do	Remainder, 3,090 acres. G. O. 135, A. G. O., 1890. Garrison not withdrawn.
Bois Blanc Island	July 22, 1884	do	9,199.43 acres. G. O. 80, A. G. O., 1884.
Boise, Fort, Idaho	Sept. 19, 1874		Wood and sawmill reservation. Not formally reserved.
Do	Apr. 19, 1884	Act Feb. 14, 1853. Sec. 9. 10 Stat., 159.	Hay reservation in excess of 640 acres.
Bragg, Fort, Cal		Act July 27, 1868	On Mendocino Indian Reservation. G. O. 74, A. G. O., 1878.
Brady, Fort, Mich	Jan. 21, 1878	Act Mar. 1, 1869	Not to exceed 1 acre to Baptist Missionary Society. G. O. 25, A. G. O., 1869.
Do		Act Mar. 3, 1875	Grants 1.26 acres for school purposes. G. O. 41, A. G. O., 1875.
Bridger, Fort, Wyo	Mar. 25, 1871	Act Feb. 24, 1871	Portion 496 square miles. G. O. 19, A. G. O., 1871.
Do	Feb. 15, 1872	do	Modifies G. O. 19, A. G. O., 1871.
Do	July 22, 1884	Act July 5, 1884	Coal reservation, 99.17 acres. G. O. 80, A. G. O., 1884.
Do	Oct. 14, 1890	do	10,240 acres. G. O. 123, A. G. O. 1890.
Brooke, Fort, Fla	Jan. 4, 1883	Act Aug. 18, 1856	148.11 acres. 11 Stat., p. 87.
Buford, Fort, N. Dak	July 30, 1891	Act July 5, 1884	Portion. Area not stated. G. O. 68, A. G. O., 1891.
Butler, Fort, N. Mex	July 22, 1884	do	76,800 acres. G. O. 80, A. G. O., 1884.
Cady, Camp, Cal	do	do	1,562 acres. G. O. 80, A. G. O., 1884.
Cameron, Fort, Utah	July 2, 1885	do	23,378 acres. War Dept. circular, July 9, 1885.
Cantonment, Ind. T	Sept. 7, 1882	Act July 31, 1882	For Indian schools.
Carlin (near), Nev	Mar. 20, 1888	Act July 5, 1884	920 acres. War Dept. circular, Mar. 26, 1888.
Carlisle Barracks, Pa	Dec. 22, 1879	Order of Secretary of War, Aug. 22, 1879.	About 30 acres. For Indian school purposes until required for military purposes.
Cascades, Fort, Wash	Feb. 2, 1867		Private claim.
Churchill, Fort, Nev	June 15, 1871		No formal reservation.
Collins, Fort, Dak	July 16, 1872	Act May 15, 1872	G. O. 35, A. G. O., 1872.
Colville, Fort, Wash	Feb. 26, 1887	Act July 5, 1884	1,070 acres. War Dept. circular Mar. 1, 1887.
Covington, Fort, Md	Jan. —, 1869	Act June 25. 1868	G. O. 39, A. G. O., 1868.
Cœur d'Alene, Fort, Idaho	Apr. 27, 1886	Act July 5, 1884	Winter pasturage, 640 acres. War Dept. circular, May 3, 1886.

C.—*List of military reservations turned over by the War Department to the Interior Department, etc.*—Continued.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Craig, Fort, N. Mex	Mar. 3, 1885	Act July 5, 1884	24,895 acres. G. O. 21, A. G. O., 1885.
Crawford, Fort, Iowa		Act July 1, 1864	
Crawford, Fort, Colo	July 22, 1884	Act July 5, 1884	Portion. G. O. 80, A. G. O., 1884.
Do	Dec. 30, 1890	do	Remainder, 5,472 acres. G. O. 148, A. G. O., 1890.
Crawford, Fort, Wis		Act Mar. 3, 1862	
Crittenden, Fort, Utah	July 22, 1884	Act July 5, 1884	94,550 acres. G. O. 80, A. G. O., 1884.
Crittenden, Camp, Ariz	do	do	3,278.08 acres. G. O. 80, A. G. O., 1884.
Crook, Fort, Cal		Act Feb. 15, 1881	Act restores to public domain. G. O. 25, A. G. O., 1881.
Cummings, Fort, N. Mex	Oct. 20, 1891	Act July 5, 1884	23,040 acres. G. O. 85, A. G. O., 1891.
Dakota, Fort, Dak		Act July 14, 1870	
Dalles, Fort, Oregon	Mar. 28, 1877	Act Mar. 3, 1877	G. O. 24, 1877.
Date Creek, Camp, Oregon	Dec. 7, 1874	Act June 22, 1874	G. O. 88, A. G. O., 1874.
Dodge, Fort, Kans	Jan. 12, 1885	Act July 5, 1884	12,000 acres. G. O. 6, A. G. O., 1885.
Douglas, Fort, Utah		Act May 16, 1874	Not to exceed 20 acres for a public cemetery. G. O. 47, A. G. O., 1874.
Do	Apr. 17, 1885	Act Jan. 21, 1885 (23 Stat., 284).	Portion (151.81 acres) private claim. G. O. 25, A. G. O., 1885.
Drum Barracks, Cal		Act Feb. 25, 1873	To be reconveyed to Banning and Wilson.
Ellis, Fort, Mont	July 26, 1886	Act July 5, 1884	32,116.10 acres. War Dept. circular July 29, 1886.
Elliott, Fort, Tex	Oct. 14, 1890	do	2,560 acres. G. O. 123, A. G. O., 1890.
Fayette, Fort, Pa		Act May 21, 1890	Public, No. 125.
Fetterman, Fort, Wyo	July 22, 1884	Act July 5, 1884	45,085.56 acres. G. O. 80, A. G. O., 1884.
Fred Steele, Fort, Wyo	Aug. 9, 1886	do	24,833.29 acres. Except cemetery site. War Department circular, Aug. 12, 1886.
Galveston, Tex		Act July 15, 1870	Lands donated to city. G. O. 100, A. G. O., 1870.
Gaston, Fort, Cal	Feb. 11, 1892	Act July 31, 1882 (22 Stat., 181).	451.5 acres. No general order. Letter of Secretary of War of Feb. 11, 1892. See G. O. 14, A. G. O., 1892.
Gibson, Fort, Ind. T	Feb. 7, 1891	Act July 5, 1884	5,541 acres. National cemetery excepted. G. O. 15, A. G. O., 1891.
Goodwin, Camp, Ariz	July 22, 1884	do	5,760 acres. G. O. 80, A. G. O., 1884.
Grant (old), Camp, Ariz	do	do	2,031.70 acres. G. O. 80, A. G. O., 1884.
Green, Fort, R. I		Act Feb. 23, 1887	To city of Newport as a public park. G. O. 25, A. G. O., 1887.
Gratiot, Fort, Mich	Nov. 9, 1880	Act July 20, 1868	Portion. G. O. 60, A. G. O., 1868.
Do		Act Mar. 18, 1870. Amends act July 20, 1868.	20.9 acres. G. O. 49, A. G. O., 1870.
Do		Act of Mar. 3, 1873	Cemetery grounds. G. O. 45, A. G. O., 1873.
Do		Act June 16, 1880	Remainder. G. O. 55, A. G. O., 1880.
Greenwood Island, Miss	Dec. 26, 1890	Act July 5, 1884	100 acres. G. O. 147, A. G. O., 1890.
Hall, Fort, Idaho	Apr. 26, 1883	Act July 31, 1882	For Indian schools.
Halleck, Fort, Nev	Oct. 11, 1886	Act July 5, 1884	10,900.93 acres. War Department circular. Oct. 28, 1886.
Hamer, Fort, Fla	Feb. 26, 1876	Act Aug. 18, 1856	
Hancock Barracks, Me		Act Mar. 14, 1872	Sale authorized.
Harker, Fort, Kans	July 12, 1880	Act June 15, 1880	G. O. 55, A. G. O., 1880.
Hartsuff, Fort, Nebr	July 22, 1884	Act July 5, 1884	3,251.41 acres. G. O. 80, A. G. O., 1884.
Hays, Fort, Kans	May 13, 1886	Act June 11, 1884	Portion, not to exceed 165 acres. G. O. 53, A. G. O., 1884.
Do	Nov. 2, 1889	Act July 5, 1884	Remainder, 7,600 acres. G. O. 81, A. G. O., 1889.
Hoskins, Fort, Oregon	Feb. 16, 1891		No formal reservation.
Hot Springs, Ark	Aug. 27, 1890	Act July 5, 1884	All of square or block 94. G. O. 96, A. G. O., 1890.
Houston, Fort, Tex		Act June 23, 1874	Donated to Fisk University for educational purposes. G. O. 86, A. G. O., 1874.

C.—*List of military reservations turned over by the War Department to the Interior Department, etc.*—Continued.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Howard, Fort, Wis		Act Mar. 3, 1863	Portion.
Do		Act July 4, 1866	Remainder.
Hualpai, Fort, Ariz	Apr. 22, 1874		No formal reservation.
Humboldt, Fort, Cal	Apr. 6, 1870		Do.
Independence, Camp, Cal	July 22, 1884	Act July 5, 1884	5,210.38 acres. G. O. 80, A. G. O., 1884.
Jesup, Fort, La	Mar. 25, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.
Jones, Fort, Cal	May 27, 1870		No formal reservation.
Jupiter, Fort, Fla	Mar. 16, 1880	Act Aug. 18, 1856 (11 Stat., 87).	9,088.38 acres. Except light house lot.
Kearney, Fort (old), Iowa		Act Apr. 15, 1874	
Kearney, Fort, Nebr	Dec. 2, 1876	Act July 21, 1876	G. O. 111, A. G. O., 1876.
Keogh, Fort, Mont		Act July 30, 1890. Public, 218.	Portion east of Tongue River.
Key Biscaine, Fla	July 9, 1870	Act Aug. 18, 1856	
Klamath, Fort, Oregon	May 4, 1886	Act July 5, 1884	3,335.68 acres. War Department circular, May 6, 1886.
Lane, Fort, Oregon	Mar. 25, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.
Lapwai, Fort, Idaho	June 5, 1882	Act July 31, 1882	Post reserve for Indian school.
Do	May 7, 1884	Act Feb. 14, 1853 (10 Stat., 159).	Hay reservation in excess of 640 acres.
Laramie, Fort, Wyo		Act Aug. 14, 1876	Restores a portion to public domain. G. O. 90, A. G. O., 1876.
Do	June 9, 1890	Act July 5, 1884	G. O. 60, A. G. O., 1890.
Larned, Fort, Kans	Mar. 26, 1883	Act Aug. 4, 1882	G. O. 110, A. G. O., 1882.
Leavenworth, Fort, Kans	Dec. 23, 1868	Act July 2, 1868	Sale of 20 acres in southeast corner to Leavenworth Coal Co.
Do		Act Feb. 9, 1871	Sale of 128.82 to Kansas Agricultural and Mechanical Association. G. O. 14, A. G. O., 1871.
Do		Act Mar. 2, 1889	Lease of 9.75 acres to Leavenworth Water Co. while lands are used as a military site. G. O. 39, A. G. O., 1889.
Lewis, Fort, Colo	Nov. 12, 1891	Act July 31, 1882 (22 Stat., 181).	30,336 acres. G. O. 89, A. G. O., 1891.
Little Rock Barracks, Ark	Oct. 14, 1890	Act July 5, 1884	36.01 acres. G. O. 123, A. G. O., 1890.
Logan, Fort, Mont	June 4, 1881	Act May 8, 1880	Sale at auction. G. O. 38, A. G. O., 1880.
Louisiana, State of*	Sept. 23, 1886	Act July 5, 1880	6,170.79 acres. War Department circular, Sept. 28, 1886.
Lowell, Fort, Ariz	Mar. 5, 1891	Act July 5, 1884	Area not stated. G. O. 24, A. G. O., 1891.
Lyon, Fort (old), Colo	July 22, 1884	do	38,000 acres. G. O. 80, A. G. O., 1884.
Lyon, Fort, Colo	Dec. 2, 1889	do	5,874 acres. G. O. 9, A. G. O., 1890.
McDermit, Fort, Nev	Dec. 1, 1886	do	Hay reservation, 6,400 acres. War Department circular, Dec. 3, 1886.
Do	July 24, 1889	do	Post reserve, 3,974.40 acres. G. O. 67, A. G. O., 1889.
McGarry, Camp, Nev	Mar. 25, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.
McDowell, Fort, Ariz	Oct. 1, 1890	Act July 31, 1882 (22 Stat., 181).	Post, buildings, etc., for Indian school purposes until required for military purposes. G. O. 115, A. G. O., 1890.
Do	Mar. 2, 1891	Act July 5, 1884	Containing 25,628 acres. G. O. 22, A. G. O., 1891.
McHenry, Fort, Md		Act June 19, 1878	Site for a dry dock to Baltimore Dry Dock Co. G. O. 44, A. G. O., 1878.
McKinney, Fort, Wyo	Jan. 16, 1889	Act July 5, 1884	Portion, estimated 640 acres. G. O., 5, A. G. O., 1889.
McPherson, Fort, Nebr	Jan. 5, 1887	do	19,500 acres, all except national cemetery tract. War Department circular, Jan. 10, 1887.
McRae, Fort, N. Mex	July 22, 1884	do	2,560 acres. G. O., 80, A. G. O., 1884.
Mackinac, Fort, Mich		Act Mar. 1, 1879	Portion to Messrs. Wendell Van Allen & Bailey. G. O. 19, A. G. O., 1879.
Maginnis, Fort, Mont	Aug. 14, 1890	Act July 5, 1884	31,059.21 acres. G. O. 91, A. G. O., 1890.

* Ten reservations on the Gulf coast as follows: One near the eastern mouth of Bayou La Fourche; one near western mouth of Bayou La Fourche; one on Bayou Plat; one near western entrance to Caminada Bay; one near the pass at the eastern end of Grand Terre Island; one near the mouth of Quatre Bayou Pass; one at Bastian Bay; three near Bastian Bay.

C.—*List of military reservations turned over by the War Department to the Interior Department, etc.*—Continued.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Mason, Fort (Point San Jose), Cal.	.....	Act July 1, 1870.....	Portion to the city and county of San Francisco, Cal. G. O. 87, A. G. O., 1870.
Missouri River, island in, Mo.	July 22, 1884	Act July 5, 1884.....	G. O. 80, A. G. O., 1884.
Mojave, Fort, Ariz	Sept. 29, 1890	Act July 31, 1882 (22 Stat., 181).	14,097 acres. Indian school purposes until required for military occupation. G. O. 111, A. G. O., 1890.
Mount Vernon Barracks, Ala.	Mar. 2, 1893	Letter of Secretary of War of Mar. 2, 1893..	All that portion south of Cedar Creek.
Oglethorpe Barracks, Ga	Apr. 7, 1884	Act Apr. 7, 1882	G. O. 46, A. G. O., 1882.
Oklahoma, Okla	Oct. 4, 1892	Act July 5, 1884.....	160 acres. G. O. 69, A. G. O., 1892.
Pagosa Springs (old Fort Lewis, Colo.).	July 22, 1884	.....do	21,838.08 acres. G. O. 80, A. G. O., 1884.
Pikes Peak, Colo	Jan. 16, 1889	.....do	8,192 acres. G. O. No. 5 of 1889.
Plattsburg Barracks, N. Y...	.....	Act June 8, 1872	25 acres to the New York and Canada R. R. Co. G. O. 66, A. G. O., 1872.
Do.....	.....	Act June 30, 1879	2 acres, etc., to R. R. Co. G. O. 70, A. G. O., 1879.
Point Roberts, Wash	Sept. 23, 1890	Act July 5, 1884.....	1,472 acres. G. O. 107, A. G. O., 1890.
Presidio of San Francisco, Cal.	.....	Act May 9, 1876.....	Portion to city of San Francisco. G. O. 44, A. G. O., 1876.
Randall, Fort, Dak	.....	Act May 18, 1874.....	Portion. G. O. 47, A. G. O., 1874.
Do.....	July 22, 1884	Act July 5, 1884.....	Portion (24,503.53 acres north of Missouri River) not already transferred under act of May 18, 1874. G. O 80, A. G. O., 1884.
Do.....	.....	Act Oct. 1, 1890 (Public, 343.)	Portion open to settlers.
Fort Randall.....	Oct. 20, 1893	Act July 5, 1884.....	Remainder 92,160 acres, G. O. 84, 1893.
Ransom, Fort, N. Dak	July 14, 1880	Act June 10, 1880	G. O. 55, A. G. O., 1880.
Reading, Fort, Cal.....	.....	Act Feb. 15, 1881.....	Restored to public domain. G. O. 25, A. G. O., 1881.
Reynolds, Fort, Colo	July 18, 1874	Act June 19, 1874	G. O. 88, A. G. O., 1874.
Rice, Fort, S. Dak	July 22, 1884	Act July 5, 1884	Estimated at 102,400 acres. G. O. 80, A. G. O., 1884.
Ridgely, Fort, Minn	.....	Act July 1, 1870.....	G. O. 87, A. G. O., 1870.
Riley, Fort, Kans	.....	joint resolution of Mar. 2, 1867.	Reduces area, etc. G. O. 29, A. G. O., 1867.
Ripley, Fort, Minn.....	.....	Act Feb. 28, 1873	Portion. G. O. 28, A. G. O., 1873.
Do.....	July 2, 1880	Act Apr. 1, 1880.....	Restored to public domain. G. O. 22, A. G. O., 1880.
Rush Lake Valley, Utah	July 22, 1884	Act July 5, 1884.....	5.131.47 acres. G. O. 80, A. G. O. 1884.
Sabine, Fort, La	Mar. 25, 1871	Act Feb. 24, 1871.....	G. O. 19, A. G. O., 1871.
St. Augustine, Fla.....	Oct. 15, 1883	Act Aug. 18, 1856 (11 Stat. 88).	0.1619 and 0.12786 acres. Hospital lot and blacksmith's shop lot.
Do.....	Mar. 18, 1886	Act July 5, 1884.....	Old powder-house lot, or governor's garden lot, 10.29 acres.
Do.....	Nov. 18, 1886	.....do	*Dragoon* barracks lot, 1.15 acres. War Department circular, Nov. 20, 1886.
St. Marks, Fla	Oct. 27, 1892	Act July 5, 1884.....	50 acres G. O. 74. A. G. O., 1892.
Sanders, Fort, Wyo	.....	Act June 9, 1874.....	Reduces area. G. O. 60, A. G. O., 1874.
Do.....	Aug. 22, 1884	Act July 5, 1884.....	19,342 acres. G. O. 102, A. G. O., 1884.
Sedgwick, Fort, Colo. and Nebr.	July 22, 1884	.....do	40,960 acres. G. O. 80, 1884.
Selden, Fort, N. Mex.....	Apr. 9, 1890	Act July 31, 1882 (22 Stat., 181).	G. O. 44, A. G. O., 1890.
Do.....	Mar. 30, 1892	Act July 5, 1884.....	9613.7381 acres. G. O. 26, A. G. O., 1892.
Seward, Fort, Dak.....	July 14, 1880	Act June 10, 1880.....	G. O. 55, A. G. O., 1880.
Shaw, Fort, Mont	Apr. 30, 1892	Act July 31, 1882 (22 Stat., 181).	29,843 acres. G. O. 30, A. G. O., 1892.
Sheridan, Camp, Nebr	July 22, 1884	Act July 5, 1884.....	18,225 acres. G. O. 80, A. G. O., 1884.
Smith, Fort, Ark.....	Mar. 25, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.
Sisseton, Fort, Dak.....	Apr. 22, 1889	Act July 5, 1884.....	81,920 acres. War Department circular, May 1, 1889.
Snelling, Fort, Minn	Dec. 23, 1873	Act May 7, 1870.....	Reduced to 1,531.21 acres. G. O. 66, A. G. O., 1870.
Soldiers, Key, Fla	July 9, 1870	Act Aug. 18, 1856	
Stambaugh, Camp, Wyo	May 3, 1881	.....	No formal reservation.
Stanton, Fort, N. Mex.....	Aug. 7, 1872	Act May 21, 1872	Reduces reservation. G. O. 35, A. G. O., 1872.

C.—*List of military reservations turned over by the War Department to the Interior Department, etc.*—Continued.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Steilacoom, Fort, Wash	.....	Act Apr. 15, 1874	Donates portion to Washington for use of insane asylum. G. O. 32, A. G. O., 1874.
Do	July 22, 1884	Act July 5, 1884	289 acres. G. O. 80, A. G. O., 1884.
Stevenson, Fort, Dak	Apr. 19, 1883	Act July 31, 1882	For Indian schools.
Sullivan, Fort, Me	July 22, 1884	Act July 5, 1884	12.5 acres. G. O. 80, A. G. O., 1884.
Sumner, Fort, N. Mex	Mar. 25, 1871	Act Feb. 24, 1871	Except national cemetery. G. O. 19, A. G. O., 1871.
Sulphur Creek, Wyo	July 22, 1884	Act July 5, 1884	Coal reservation. G. O. 80, A. G. O., 1884.
Thornburg, Fort, Utah	....do	.....do	21,851 acres. G. O. 80, A. G. O., 1884.
Thomas, Fort, Ariz	Dec. 2, 1892	.....do	10,487 acres. G. O. 81, A. G. O., 1892.
Three Forks, Owyhee, Camp Idaho.	July 22, 1884	.....do	4,800 acres. G. O. 80, A. G. O., 1884.
Totten, Fort, Dak	Oct. 1, 1890	Act July 31, 1882 (22 Stat., 181).	Post, buildings, etc., for Indian school purposes until required for military purposes. G. O. 115, A. G. O., 1890.
Uncompahgre, Cantonment, on Colorado.	July 22, 1884	Act July 5, 1884	Portion 4,000 acres. G. O. 80, A. G. O., 1884.
Verde, Fort, Ariz	....do	.....do	Garden tract, 3,000 acres. G. O. 80, A. G. O., 1884.
Do	Oct. 14, 1890	.....do	9,293.79 acres. G. O. 123, A. G. O., 1890.
Wallace, Fort, Kans	July 22, 1884	.....do	8,926.09 acres. G. O. 80, A. G. O., 1884.
Walla Walla, Fort, Wash	Oct. 26, 1875	Act Apr. 29, 1872	Portion of hay reserve. G. O. 35, A. G. O., 1872.
Do	....do	Act June 8, 1872	Timber reserve. G. O. 66, A. G. O., 1872.
Do	May 3, 1880	.....do	Remainder of hay reserve.
Do	....do	.....do	Portion of post reservation.
Wallen, Camp, Ariz	Apr. 22, 1874	.....	No formal reservation.
Washita, Fort, Ind. T	July 1, 1870	.....	Do.
Waterford, Pa	.....	Act Mar. 4, 1868	
Wayne, Fort, Ark	Mar. 26, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.
Whipple Barracks, Ariz	Oct. 21, 1875	Act June 22, 1874	Portion. G. O. 88, A. G. O., 1874.
Do	July 22, 1884	Act July 5, 1884	Timber reserve, 720 acres. G. O. 80, A. G. O., 1884.
White River, Camp, on Colorado.	....do	.....do	40,960 acres. G. O. 80, A. G. O., 1884.
Wilkins, Fort, Mich	....do	.....do	148.35 acres. G. O. 80, A. G. O., 1884.
Willow Grove, Camp, Ariz	Apr. 22, 1874	.....	No formal reservation.
Wilmington Depot, Cal	.....	Act Feb. 25, 1873	To be reconveyed to Banning and Wilson. G. O. 45, A. G. O., 1873.
Yuma, Fort, Ariz	Dec. 7, 1874	Act June 22, 1874	Portion. G. O. 88, A. G. O., 1874.
Yuma, Fort, Ariz. and Cal	Jan. 9, 1884	.....	Indian school purposes.
Do	July 22, 1884	Act July 5, 1884	Inoperative. G. O. 80, A. G. O., 1884.
Zarah, Fort, Kans	Mar. 25, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.

D.—*Military reservations showing location, size, how occupied, etc., on June 30, 1893.*

Adams, Fort, R. I.—Latitude, 41° 28′; longitude, 71° 22′. On Brentons Point, 3 miles from Newport, which is the post-office, railroad, and telegraph station, and from which the post is reached by boat or road. Contains 138½ acres. Cession of jurisdiction by State act of June 5, 1824. Present garrison, headquarters and 4 batteries of artillery. Accommodations for 16 officers in cottages and 7 in casemates. Accommodations for 208 men. One barrack building for light battery outside of fort, and casemates occupied by 3 foot batteries. One band barrack and one artillery stable. Water supply from Newport City waterworks. Sewer system.

Alcatraz Island, Cal.—Latitude, 37° 49′; longitude, 122° 27′. In the Bay of San Francisco, 4 miles northeast from the city. Post-office at the post. Railroad and telegraph station, San Francisco. Government steamer to post daily, except Sunday. Reservation, the whole island, about 12 acres. Cession of jurisdiction by State act of March 31, 1891. Present garrison, 2 batteries of artillery. Accommodations for 10 officers and 73 men, one double barrack. Salt-water supply pumped from the bay by steam power. Fresh water brought from San Francisco on steamer and stored in cisterns. Sewer system.

Angel Island, Cal.—Latitude, 37° 48′; longitude, 122° 28′. In the Bay of San Francisco, 7 miles northeast from the city. Post-office and telegraph station at the post. Railroad station, San Francisco. Government steamer to post daily, except Sunday. Reservation, the entire island, about 640 acres. Cession of jurisdiction by State act of March 31, 1891. Present garrison, headquarters and 5 companies of infantry. Accommodations for 13 officers and 204 men, 5 barracks, and 1 band barrack. Water supply from springs conducted by gravity to reservoirs, whence distribution is made to all parts of the post. Sewer system.

Apache, Fort, Ariz.—Latitude, 33° 47′; longitude, 109° 57′. On White Mountain River, in Apache County, 90 miles from Holbrook, on Atlantic and Pacific Railroad, and 339 miles from Prescott. Post-office and telegraph station at the post. Buckboard daily, except Sunday, from Holbrook. Reservation, 7,421 acres. Present garrison, 1 troop of cavalry and 3 companies of infantry. Accommodations for 16 officers and 420 men, 7 barracks. Five cavalry stables. Water supply brought by gravity from 3 miles up the White River through an acequia, and is then pumped into a reservoir (80,000 gallons). No sewer system.

Assiniboine, Fort, Mont.—Latitude, 48° 30′; longitude, 109° 45′. On Beaver Creek, 1½ miles from station of same name on Great Northern Railroad, 209 miles from Helena, and 996 miles from St. Paul. Post-office, telegraph, and railroad station at the post. Reservation, about 704.000 acres, reduced by General Order 85, of 1891. Area of reduction not stated. Cession of jurisdiction by constitution of Montana. Present garrison, 2 troops of cavalry and headquarters, and 7 companies infantry. Accommodations for 36 officers and 605 men. Ten barracks; 4 cavalry stables; water supply from Beaver Creek, forced by steam power into a distributing tank; supply inadequate in summer. An artesian well is being sunk with the view of securing a more permanent supply; no sewer system; natural drainage; night soil removed by scavengers.

Barrancas, Fort, Fla.—Latitude, 30° 19′; longitude, 87° 16′. On north side of Pensacola Harbor, 9 miles southwest of Pensacola. Post-office, Warrington, Fla.; telegraph station, Pensacola navy-yard; railroad station at Pensacola; special boat to post. Reservation contains about 2,500 acres, the boundaries of which were modified by General Order 18, Adjutant-General's Office, 1892. No cession of jurisdiction. Present garrison, 2 batteries artillery and 1 company infantry. Accommodations for 11 officers and 186 men; 1 barrack building designed for 4 companies. Water supply pumped from wells into tank and distributed by gravity. Sewer system.

Bayard, Fort, N. Mex.—Latitude, 32° 48′; longitude, 108° 9′. Nine miles from Silver City, on Atchison, Topeka and Santa Fe Railroad. Post-office and telegraph station at the post. Railroad station, Hall's, 2 miles from post; no stage. Reservation, 13 square miles and 520 acres. Present garrison, headquarters, 4 companies infantry, and 2 troops cavalry; accommodations for 20 officers and 400 men; 7 barracks and 1 band barrack; 4 cavalry stables. Water supply pumped from springs to reservoir and distributed through iron pipes by gravity. Sewer system.

Benicia Barracks, Cal.—Latitude, 38° 2′; longitude, 122° 7′. Post-office, telegraph station, and boat landing, Benicia; distance, 1 mile. Railroad station, Central Pacific, Army Point, distance ¾ mile. Reservation, 98.78 acres. Cession of jurisdiction by State acts of April 27, 1852, and March 14, 1855. Present garrison, 3 companies infantry. Accommodations for 8 officers and 122 men; 4 barracks. Water supply from Benicia Water Company and well at the post. Sewer system.

Bidwell, Fort, Cal.—Latitude, 41° 52′; longitude, 120° 6′. In Surprise Valley, 193 miles from Reno, Nev., on Central Pacific Railroad, 452 miles from San Francisco, 8 miles from the Oregon line, and same distance from the Nevada line; post-office at the post; telegraph station, Alturas, Cal.; daily stage from Amedee Station, Cal., distance 135 miles. Reservation, 3,091 acres. Present garrison, 1 company of cavalry. Accommodations for 8 officers and 127 men; 2 barracks. Two cavalry stables. Water supply from a mountain stream, distributed by gravity; a never-failing warm spring at the post supplies water for bathing; natural drainage. This reservation was turned over to the Interior Department by G. O. 135, A. G. O., 1890, but the garrison has not yet been withdrawn.

Bliss, Fort, Tex.—Latitude, 31° 44′; longitude, 106° 29′. On the Rio Grande, 1½ miles above El Paso, on the Atchison, Topeka and Santa Fe Railroad. Post-office, telegraph and railroad station, El Paso, Tex. Reservation, 134.85 acres. Cession of jurisdiction imperfect. Present garrison, 2 companies infantry. Accommodations for 7 officers and 130 men; 2 barracks. Water supply from El Paso city waterworks. Quality not good. Water for drinking purposes hauled from new Fort Bliss. Sewer system.

Bliss (new) *Fort, Tex.*—Latitude, 31° 44′; longitude, 106° 29′. On the Kansas City, El Paso and Mexican Railroad, about 6 miles northeast of the city of El Paso. Post-office, telegraph and railroad station, El Paso, Tex. Reservation, 1,265.7 acres. Title acquired under act of March 1, 1890. Cession of jurisdiction by deed of the governor of the State of Texas, dated April 12, 1892. Accommodations for 14 offi-

cers and 250 men; 2 double barracks. Complete water system supplied from artesian wells.

Boise Barracks, Idaho.—Latitude, 43° 32′; longitude, 116° 10′. On the Boise River, 2 miles from Boise City, and 36 miles from Idaho City. Post-office, telegraph and railroad station, Boise City. Reservation, 640 acres. Cession of jurisdiction by State act of February 7, 1891. Present garrison, 1 troop cavalry and 1 company infantry. Accommodations for 7 officers and 130 men; 2 barracks; 1 cavalry stable. Water supply from reservoir, fed by springs, distributed through iron pipes by gravity, for irrigation and sprinkling. Supply for other purposes from Artesian Hot and Cold Water Company of Boise City.

Bowie, Fort, Ariz.—Latitude, 32° 10′; longitude, 109° 22′. In Apache Pass, 13 miles from Bowie Station, on the Southern Pacific Railroad. Post-office and telegraph station at the post. Daily buckboard from Bowie Station. Reservation, 36 square miles. or 23,040 acres. Present garrison, 2 troops cavalry. Accommodations for 10 officers and 160 men; 3 barracks; 2 cavalry stables. Water supply from Bear Springs, pumped by steam power to reservoir, and distributed by gravity. Sewer system.

Brady, Fort, Mich.—Latitude, 46° 30′; longitude, 84° 20′. Within limits of the city of Sault Ste. Marie, on right bank of St. Marys River. Post-office, telegraph and railroad station, Sault Ste. Marie. Boat lands at post in summer. Reservation 26¼ acres. No special cession of jurisdiction, unless embraced in general provision of State act of March 24, 1874. Present garrison, 1 company infantry. Accommodations for 6 officers and 73 men; 1 double and 1 single barrack. Water supplied from Sault Ste. Marie waterworks.

Brady (new), *Fort, Mich.*—Latitude, 46° 30′; longitude, 84° 20′. To the west of and adjoining the city of Sault Ste. Marie, Mich., on the Minneapolis, Sault Ste. Marie and Atlantic Railroad. Post-office, telegraph and railroad station, Sault Ste. Marie. Reservation, about 75 acres. Title acquired under the provisions of act of July 8, 1886. Cession of jurisdiction same as old Fort Brady. Accommodations for 12 officers; 2 barracks for 4 companies. Present garrison, 2 companies infantry. Water supply from Saulte Ste. Marie waterworks. Sewer system.

Brown, Fort, Tex.—Latitude, 25° 53′; longitude, 97° 21′. On the Rio Grande, adjoining the city of Brownsville. Post-office, telegraph and railroad station, Brownsville. Reservation, 358½ acres, owned by private parties. Occupied and used by the United States since March, 1846, without payment of rent or taxes. Appropriation for purchase at $160,000. Payment suspended by authority of resolution of Congress. Suit pending in Court of Claims to compel payment. Present garrison, 2 troops of cavalry. Accommodations for 20 officers and 244 men; 4 barracks. Four sets officers' quarters reported worthless. Two cavalry stables. Water supply pumped from Rio Grande into distributing tanks. No sewer system. Open drains.

Buford, Fort, N. Dak.—Latitude, 47° 59′; longitude, 103° 58′. On Missouri River, 2 miles below the mouth of the Yellowstone, on the line of the Great Northern Railroad, 660 miles from St. Paul. Post-office, telegraph and railroad station at the post. Reservation, about 506,042 acres. Reduced by General Orders 68 of 1891 and area not stated. Cession of jurisdiction by constitution of North Dakota. Present garrison, 2 troops cavalry and 3 companies infantry. Accommodations for 18 officers and 326 men; 6 barracks and 1 band barrack. Two cavalry stables. Water supply pumped from the Missouri River into an elevated tank and distributed by iron pipes. Partial sewer system.

Canby, Fort, Wash.—Latitude, 46° 17′; longitude, 124° 3′. At the mouth of Columbia River, on the north bank, 14 miles from Astoria, 7 miles from Fort Stevens, Oregon, 112 miles from Portland, Oregon, and 118 miles from Fort Vancouver. Post-office and telegraph station at post; daily steamer from Portland to Astoria, and thence by steam tug to post. Reservation, 588.2 acres. Cession of jurisdiction by constitution of Washington. Present garrison, 2 batteries of artillery. Accommodations for 7 officers and 120 men; 2 barracks. Water supply from springs pumped to reservoir and distributed by gravity. Sewer system.

Carroll, Fort, Md.—Latitude, 39° 15′; longitude, 76° 35′. Post-office and telegraph station, Baltimore; distant 6½ miles from Light street wharf. Reservation, 4 acres. Cession of jurisdiction by State act of March 2, 1846. Not garrisoned. In charge of Engineer Department.

Caswell, Fort, N. C.—Latitude, 34°; longitude, 78° 1′. Oak Island, North Carolina, 2 miles from Southport and 22 miles from Wilmington. Post-office and telegraph station, Southport, N. C. Steamer daily from Wilmington to Southport. Reservation, about 2,325 acres. Cession of jurisdiction by State act of December 26, 1825. Not garrisoned. In charge of ordnance sergeant.

Clark, Fort, Tex.—Latitude, 29° 17′; longitude, 100° 25′. On Las Moras Creek, adjoining the town of Brackettville, 9 miles from Spofford Junction, on Southern Pacific Railroad, and 143 miles from San Antonio. Post-office, Brackettville, Tex., telegraph station, Fort Clark, via Spofford Junction; daily stage from Spofford

Junction. Reservation, 3,963.2 acres. Cession of jurisdiction by State act of December 19, 1849, and governor's deed of April 14, 1884. Present garrison, 2 troops cavalry, headquarters, and 6 companies infantry. Accommodation for 35 officers and 748 men; 13 barracks; 8 cavalry stables. Water supply from Las Moras Springs pumped into tanks and distributed by iron pipes. No sewer system.

Clarks Point, Mass.—Latitude, 41° 35′; longitude, 90° 54′. Four miles from New Bedford, which is the post-office and telegraph station. Reservation, 60 acres. Cession of jurisdiction by State act of April 8, 1856, and May 4, 1857. Not garrisoned. In charge of ordnance sergeant.

Clinch, Fort, Fla.—Latitude, 30° 41′; longitude, 81° 28′. On Amelia Island, Florida, 3 miles from Fernandina, which is the post-office, telegraph and railroad station. Reservation, 419.44 acres. No cession of jurisdiction. Not garrisoned. In charge of ordnance sergeant.

Columbus Barracks, Ohio.—Latitude, 39° 57′; longitude, 82° 59. Post-office and railroad station, Columbus, Ohio; telegraph station at post. Reservation, 77 acres 3 roods 8 perches. Cession of jurisdiction by State act of March 21, 1863. Recruiting depot. Accommodations for 19 officers and 555 men; 3 barracks; 1 of which will accommodate 400 men. Water supply, Columbus city waterworks. Sewer system.

Columbus, Fort, New York Harbor.—Latitude, 40° 42′; longitude, 74° 9′. On Governors Island, at junction of North and East rivers, 1½ miles from New York City. Post-office, New York, and telegraph station, Governors Island. Government steamer from New York, City. Contains about 65½ acres. Cession of jurisdiction by State act of February 15, 1800, and (as to water-covered land) by act of May 7, 1880. Present garrison, 3 batteries of artillery. Fort Columbus will accommodate 11 officers and 174 men; barracks for 3 small companies. Two sets officers' quarters in course of construction. Governors Island (headquarters Department of the East) has accommodations for 18 officers. Water supply from Brooklyn city waterworks.

Constitution, Fort, N. H.—Latitude, 43° 4′; longitude, 70° 49′. On Great Island, New Hampshire, 3 miles from Portsmouth. Post-office, New Castle, N. H. Telegraph and railroad station, Portsmouth. Stage or steamer from Portsmouth. Reservation, 3½ acres. Cession of jurisdiction by State acts of February 14, 1791, and June 18, 1807. Not garrisoned. In chargeof ordnance sergeant.

Crook, Fort, Nebr.—Latitude, 41° 20′; longitude, 96°. On the Union Pacific Railroad, about 5 miles southwest of the city of Omaha. Post-office, telegraph, and railroad station, Omaha. Reservation, 545.67 acres, acquired under act of July 23, 1888. Cession of jurisdiction by State act of March 30, 1889. The reservation has been inclosed, and the post, including water and sewer system, is in course of construction.

Custer, Fort, Mont.—Latitude, 45° 44′; longitude, 107° 31′. On the Big Horn River, 33 miles from Custer Station, on the Northern Pacific Railroad, 838 miles from St. Paul. Post-office and telegraph station at the post. Daily stage and mail from Custer Station. Reservation, 36 square miles. Custer battlefield, 1 square mile. Cession of jurisdiction by constitution of Montana. Present garrison, headquarters, 5 troops cavalry, and 2 companies infantry. Accommodations for 24 officers and 565 men; 10 barracks; 7 cavalry stables. Water pumped from Little Big Horn River by steam power to an elevated tank and distributed by a system of iron pipes. Natural drainage. Partial sewer system.

D. A. Russell, Fort, Wyo.—Latitude, 41° 8′; longitude, 104° 50′. On Crow Creek, 3 miles west of Cheyenne, which is on Union Pacific Railroad. Post-office, telegraph and railroad station (Cheyenne and Northern) at the post. Post reservation, 4,512 acres. Hay reservation, 2,540.64 acres. Cession of jurisdiction by State act of February 17, 1893. Present garrison, all of Seventeenth Infantry. Accommodations for 36 officers and 439 men; 9 barracks and 1 band barrack; 4 cavalry stables. The water supply system is received from Crow Creeek by percolation through the gravel strata into five wells, from whence it is pumped into two reservoirs and distributed to the post. Sewer system.

Davids Island, N. Y.—Latitude, 40° 53′; longitude, 73° 48′. At the southwestern extremity of Long Island Sound, 3 miles from New Rochelle, Westchester County, N. Y., 22 miles from New York City. Post-office at the post. Telegraph station, New Rochelle, N. Y. Horse cars and boat to the post. Reservation, the entire island, about 86½ acres. Cession of jurisdiction by State act of April 20, 1868, and (as to water-covered land) by act of May 7, 1880. Recruiting depot. Accommodations for 12 officers and 632 men; 12 barracks. One set officers' quarters in course of construction. Water supply from New Rochelle waterworks. Sewer system.

Davis, Fort, Tex.—Latitude, 30° 36′; longitude, 103° 36′. In Jeff Davis County, Tex., in a pass of the Apache Mountains, 22 miles from Marfa, on the Galveston, Harrisburg and San Antonio Railroad. Reservation, 300 acres. Cession of jurisdiction by State act of December 19, 1849, and governor's deed of September 17, 1883. Not garrisoned.

Delaware, Fort, Del.—Latitude, 39° 35′; longitude, 76° 34′. On Pea Patch Island, Delaware, 1½ miles from Delaware City and 42 miles from Philadelphia. Post-office

and telegraph station, Delaware City. Daily steamer from Philadelphia to Delaware City. Reservation, about 90 acres. Cession of jurisdiction by State act of March 27, 1813. Not garrisoned. In charge of ordnance sergeant.

Del Rio Camp, Tex.—Latitude, 29° 22′; longitude, 100° 46′. On Galveston, Harrisburg and San Antonio Railroad, 1 mile from the station. Reservation, 407.93 acres. Cession of jurisdiction by State act of December 19, 1849, and governor's deed of July 28, 1882. Accommodations for 4 officers and 40 men (estimated). Not garrisoned. In charge of paid custodian.

Douglas, Fort, Utah.—Latitude, 40° 46′; longitude, 111° 56′. East of and overlooking Salt Lake City. Distance, 3 miles. Post-office, telegraph, and railroad station, Salt Lake City, which is on Utah Central and Rio Grande Western Railroads, 37 miles from Ogden on Union Pacific Railroad. Horse cars from Salt Lake City to post. Post is also reached from Salt Sake City by trains on Salt Lake and Fort Douglas Railroad. Reservation, 4 square miles, less 151 acres surrendered by act of Congress. Enlarged by act of March 3, 1887, and by G. O. 39 of 1890. Present garrison, all of Sixteenth Infantry. Accommodations for 29 officers and 534 men; 10 barracks and 1 band barrack and office building. Water supply piped by gravity to reservoir at post and distributed through iron pipes. Sewer system.

Duchesne, Fort, Utah.—Latitude, 40° 16′; longitude, 109° 52′. On the right bank of the Uintah River, about 8 miles above its confluence with the Duchesne River, and on the road between Ouray, about 20 miles distant, and White Rocks, about 15 miles distant. Post reached by wagon and stage from Price Station, distance 88 miles, on Denver and Rio Grande Western Railroad. Freight goes by this route. Post-office and telegraph station at the post. Reservation provisional, 6 square miles, within the limits of the Uintah Indian Reservation. Present garrison, 2 troops cavalry. Accommodations for 19 officers and 315 men; 6 barracks; 2 cavalry stables. Water supplied by water wagon. No sewer system.

Dutch Island, R. I.—Latitude, 41° 30′; longitude, 71° 24′. Five miles from Newport. Post-office, Jamestown, R. I. Telegraph station, Newport. Steam ferry from Newport to Jamestown, 4 miles, and private boat thence to post, 1 mile. Reservation, 75 acres. Cession of jurisdiction by State act of January 18, 1865. Not garrisoned. In charge of ordnance sergeant.

Eagle Pass, Tex.—Latitude, 28° 42′; longitude, 100° 30′. In Maverick County, part of old Fort Duncan. Reservation, 62.94 acres, leased. Present garrison, 1 troop cavalry. Accommodations for 8 officers and 61 men; 2 barracks, 1 reported worthless; 2 cavalry stables.

Ethan Allen, Fort, Vt.—Latitude, 44° 30′; longitude, 73° 10′. Situated partly in Colchester and partly in Essex Township, Chittenden County, 2 miles from Essex Junction and 5 miles from Burlington. Reservation, 600 acres. Cession of jurisdiction by State act of November 18, 1892. Buildings for a 4-company cavalry post in course of construction.

Finns Point, N. J.—Latitude, 39° 32′; longitude, 75° 45′. On the Delaware River, 6 miles from Salem, N. J., which is the post-office, telegraph, and railroad station. Reservation, 104.35 acres. Cession of jurisdiction by State acts of April 6, 1871, and February 1, 1872. Not garrisoned. In charge of Engineer Department.

Foote, Fort, Md.—Latitude, 38° 48′; longitude, 77° 41′. On the Potomac River, 9 miles from Washington. Post-office at the post. Telegraph station, Alexandria, Va. Steamer from Washington, D. C. Reservation, about 66¼ acres. Cession of jurisdiction by State act of April 1, 1872. Not garrisoned. In charge of ordnance sergeant.

Gaines, Fort, Ala.—Latitude, 30° 15′; longitude, 88° 4′. On Dauphin Island, Ala., 30 miles from Mobile by boat, which is the post-office, telegraph, and railroad station. Reservation, about 983.9 acres. Cession of jurisdiction by State act of January 28, 1853, and governor's deed of November 25, 1853. Not garrisoned. In charge of ordnance sergeant.

Goose Island, Wash.—Latitude, 48° 31′; longitude, 122° 58′. In the Strait of San Juan de Fuca.

Georges, Fort, Me.—Latitude, 43° 39′; longitude, 70° 13′. On Hog Island, Portland Harbor, Me., 2 miles from Portland, which is the post-office, telegraph, and railroad station. Reservation, about 1½ acres. Cession of jurisdiction by State act of April 17, 1857. Not garrisoned. In charge of ordnance sergeant.

Grant, Fort, Ariz.—Latitude, 32° 37′; longitude, 109° 54′. In Graham County, 27 miles from Wilcox, on the Southern Pacific Railroad. Post-office and telegraph station, at the post. Daily stage, except Sunday, from Wilcox. Reservation, 42,341 acres. Present garrison, headquarters, 5 troops cavalry. Accommodations for 20 officers and 380 men; 7 barracks; 6 cavalry stables. Water supply piped from reservoir fed by streams. Sewer system.

Griswold, Fort, Conn.—Latitude, 41° 22′; longitude, 81° 8′. Groton Heights, 1 mile from New London. Post-office, Groton, Conn. Telegraph and railroad station, New London. Ferry from New London to post. Reservation, 14 acres. Cession of juris-

diction by State act of June 9, 1842. Not garrisoned. In charge of ordnance sergeant.

Hamilton, Fort, N. Y.—Latitude, 40° 37′; longitude, 74° 1′. On shore of Long Island, 5½ miles south of New York City, commanding the Narrows. Post-office and telegraph station, at the post. City railroad from Brooklyn, distance 6 miles. Reservation, 98 acres. In addition thereto 55 acres have recently been acquired by condemnation proceedings. Cession of jurisdiction by State acts of March 20, 1807, March 18, 1808, November 27, 1824, April 17, 1826, February 14, 1851, April 18, 1861, February 20, 1862, and (as to water-covered land) May 7, 1880, and commissioner's deed of November 16, 1812. Present garrison, headquarters and 4 companies artillery. Accommodations for 21 officers (2 in casemates) and 250 men; 4 barracks; 1 artillery stable. Water supply from Brooklyn City waterworks. Sewer system.

Hancock, Fort, Tex.—Latitude, 31° 20′; longitude, 105° 55′. Situated on the Rio Grande, 54 miles southeast of El Paso and 1¾ miles from Hancock Station, on the Southern and Texas Pacific Railroad. Post-office, at the post. Telegraph and railroad station, Fort Hancock Station, distance 1¾ miles. Reservation, 469.2 acres. Cession of jurisdiction by State act of December 19, 1849, and governor's deed of October 8, 1883. Present garrison, 1 company cavalry. Accommodations for 4 officers and 63 men; 1 barrack; 1 cavalry stable. Water supply pumped from a well near the Rio Grande into settling tanks and distributed by iron pipes. Tile drains leading to cesspools; no other sewerage.

Harrison, Fort, Mont.—Latitude, 46° 33′; longitude, 111° 58′. Situated near the city of Helena, in Lewis and Clarke County. Reservation, 1,040 acres, acquired by donation to the United States by citizens of Montana, under act of Congress of May 12, 1892. Cession of jurisdiction by State act of February 14, 1891. Plans for the post are in course of preparation.

Huachuca, Fort, Ariz.—Latitude, 31° 33′; longitude, 110° 16′. In Cochise County, 7 miles from Huachuca siding, on the New Mexico and Arizona Railroad. Post-office and telegraph station, at the post. Daily buckboard from Huachuca siding. Reservation, 70 square miles. Present garrison, 2 troops cavalry and 4 companies infantry. Accommodations for 20 officers and 420 men; 6 barracks; 5 cavalry stables. Water supply piped from springs 3 miles distant to distributing reservoirs. Sewer system.

Independence, Fort, Mass.—Latitude, 42° 21′; longitude, 71°. On Castle Island, Boston Harbor, 3 miles from Boston, which is the post-office, telegraph, and railroad station. Government tug from Boston. Reservation, 12 acres. Cession of jurisdiction by State act of June 25, 1798. Not garrisoned. In charge of ordnance sergeant. Accommodations for 1 field and 6 company officers in cottages outside the fort, and for 80 men, 2 batteries, in casemates.

Jackson Barracks, La.—Latitude, 29° 57′; longitude, 90°. On the east bank of the Mississippi River, 6 miles below the city of New Orleans, which is the post-office and railroad station. Telegraph station, Slaughter house, St. Bernard Parish, La. Street cars from New Orleans pass the post. Reservation, 87.87 acres. Cession of jurisdiction believed to be covered by general State act of July 6, 1882. Present garrison, 2 companies infantry. Accommodations for 11 officers and 96 men; 4 barrack buildings accommodate 24 men each. Water supply pumped from the Mississippi River. Surface drainage by brick-lined drains.

Jackson, Fort, La.—Latitude, 29° 21′; longitude, 89° 26′. Seventy-three miles from New Orleans. Post-office, Neptune, La. Telegraph station, Quarantine, La. Steamer triweekly from New Orleans. Reservation, 740.97 acres. Cession of jurisdiction by State act of June 1, 1846. Not garrisoned. In charge of ordnance sergeant.

Jefferson Barracks, Mo.—Latitude, 38° 28′; longitude, 90° 17′. In South St. Louis, on the Mississippi River. Post-office, telegraph, and railroad station, at the post. Reservation, 1,379.06 acres, with 118.15 acres in adverse possession by different parties. Cession of jurisdiction by State act of March 18, 1892. Recruiting depot. Accommodations for 18 officers; 7 barracks. Four sets officers' quarters in course of construction. Water supply from St. Louis waterworks. Sewer system.

Jefferson, Fort, Fla.—Latitude, 24° 38′; longitude, 82° 52′. Garden Key, 71 miles from Key West. Post-office and telegraph station, Key West, Fla. Boat from Key West to post. Reservation, 5 acres. Cession of jurisdiction believed to be covered by general State act of July 24, 1845, though there is no record of any formal deed of cession by the governor (see XIII Op. Att. Gen., 411). Not garrisoned. In charge of ordnance sergeant. There are two substantial three-story brick buildings; one for officers' quarters, 63 rooms; the other for soldiers, 50 rooms.

Johnston, Fort, N. C.—Latitude, 34°; longitude, 78° 5′. Twenty-six miles from Wilmington. Post-office and telegraph station, Southport, N. C. Steamer daily from Wilmington. Reservation, 43,560 square feet. Cession of jurisdiction by State acts of July 17, 1794, December 8, 1804, December 17, 1807, and December 19, 1809. Not garrisoned. In charge of ordnance sergeant. One set of officers' quarters used as signal office. No barracks.

Keogh, Fort, Mont.—Latitude, 46° 23′; longitude, 105° 57′. On the Northern Pacific Railroad, 747 miles from St. Paul. Post-office, telegraph, and railroad station, at the post. Reservation, about 90 square miles. Cession of jurisdiction by constitution of Montana. Present garrison, 2 troops cavalry and headquarters and 7 companies infantry Accommodations for 27 officers and 535 men; 9 barracks and 1 band barrack; 2 cavalry stables. Water supply pumped from a well near the Yellowstone River and distributed through iron pipes by direct pressure. Partial sewer system.

Key West Barracks, Fla.—Latitude, 24° 33′; longitude, 81° 48′. Post-office, telegraph station, and boat landing, Key West. Reservation, 22.79 acres. Cession of jurisdiction by State acts of July 8, 1845, and July 24, 1845. Present garrison, battery of artillery. Seven sets of officers' quarters and 2 barracks. Water supply from cisterns.

Knox, Fort, Me.—Latitude, 44° 34′; longitude, 68° 48′. In Hancock County, three-fourths of a mile from Bucksport by ferry. Post-office, Prospect Ferry, Me. Telegraph and railroad station, Bucksport. Reservation, 150 acres. Cession of jurisdiction by State act of March 12, 1844. Not garrisoned. In charge of ordnance sergeant. No quarters for men or officers.

Lafayette, Fort, N. Y. Harbor.—Latitude, 40° 37′; longitude, 74° 2′. Six miles from Brooklyn. Post-office and telegraph station, at the post. City railroad from Brooklyn. Reservation, about 2 acres. Cession of jurisdiction by State acts of March 20, 1807, March 18, 1808, and (as to water-covered land) May 7, 1880, and commissioner's deed of November 6, 1812. Not garrisoned. In charge of commanding officer at Fort Hamilton, N. Y.

Leavenworth, Fort, Kans.—Latitude, 39° 21′; longitude, 94° 55′. On the Missouri River, above and adjoining Leavenworth City. Post-office, telegraph, and railroad station, at the post. Post reservation, about 5,960 acres; timber reservation, across the river in Missouri, of 939.37 acres. Cession of jurisdiction by State acts of February 23, 1872, and February 22, 1875. But as to timber reservation, no cession. Present garrison, 4 troops cavalry, headquarters, and 8 companies infantry. Accommodations for 103 officers and 685 men; 11 barracks; 6 cavalry stables and 2 additional in course of construction. Water supply, Fort Leavenworth Water Company.

Leavenworth Military Prison, Kans.—Latitude, 39° 21′; longitude, 94° 55′. On the Fort Leavenworth Reservation. Post-office, telegraph, and railroad station, Fort Leavenworth.

Little Rock, Ark. (new post).—Latitude, 34° 43′; longitude, 92° 10′. Site of 1,100 acres, more or less, has been acquired by the United States and accepted by the Secretary of War under authority of act of April 23, 1892, and the tittle approved by the Attorney-General. It is situated on a bluff overlooking the valley of the Arkansas River just above the city of Little Rock. Cession of jurisdiction by State act of February 25, 1893. Plans for a post are now being prepared.

Livingston, Fort, La.—Latitude, 29° 15′; longitude, 90°. On Grand Terre Island. Post-office, Grand Isle, La. Telegraph and railroad station, New Orleans. Steamer weekly from New Orleans; distance, 95 miles. Reservation, 610 acres. Cession of jurisdiction by State acts of March 10, 1834, and governor's deed of May 14, 1834. Not garrisoned. Turned over to Quartermaster Department in 1888, and now in charge of light house keeper.

Logan, Fort, Colo.—Latitude, 39° 40; longitude, 105° 1′. On Bear Creek, 7½ miles south of Denver. Post-office, telegraph, and railroad station (Denver and Rio Grande), at the post. Reservation, 640 acres. Cession of jurisdiction by State act of March 22, 1887, and governor's deed of June 14, 1887. Present garrison, headquarters and 6 companies infantry. Accommodations for 24 officers and 384 men; 8 barracks; 2 cavalry stables. Water supply pumped from two artesian wells to a reservoir and distributed through iron pipes. Sewer system.

Mackinac, Fort, Mich.—Latitude, 45° 51′; longitude, 84° 41′. On Mackinac Island in the Straits of Mackinac, overlooking the village of Mackinac. Post-office and telegraph station, Mackinac Island, Mich. Boat from Mackinaw City (11 miles) and from St. Ignace (5 miles). Steamboats from Chicago, Detroit, and other lake ports arrive daily. Military reservation proper, 103.41 acres. No special cession of jurisdiction. Cession, perhaps, embraced in general provisions of State act of March 2, 1874. National park, under the immediate control of military authorities, 821 acres. Present garrison, 1 company infantry. Accommodations for 7 officers and 92 men; 1 barrack, crowded, for 2 companies. Water supply pumped from springs to reservoir and distributed by iron pipes. Sewer system.

Macomb, Fort, La.—Latitude, 30° 5′; longitude, 89° 51′. One and a half miles from Chef Menteur. Post-office, Lee, La. Telegraph station, Chef Menteur, La. Reservation, 1,364.71 acres. Jurisdiction believed to be ceded by State act of June 1, 1846. Not garrisoned. In charge of ordnance sergeant.

Macon, Fort, N. C.—Latitude, 30° 41′; longitude, 76° 40′. Two miles from Morehead City. Post-office, Beaufort, N. C. Telegraph and railroad station, Morehead City. Reservation, 1½ square miles. Cession of jurisdiction by State act of Decem

ber 17, 1807. Not garrisoned. In charge of ordnance sergeant. Four sets of officers' quarters and 2 sets of noncommissioned officers' quarters, all in bad condition.

Madison Barracks, N. Y.—Latitude, 43° 57′; longitude, 76° 15′. On the south shore of Black River Bay, about 10 miles from Lake Ontario, at the town of Sacketts Harbor, which is the post-office, telegraph, and railroad station. Reservation, 39¼ acres. In addition to which about 52 acres have been acquired under provision of act of March 2, 1889. Cession of jurisdiction by State act of May 12, 1892. Present garrison, headquarters and 6 companies infantry. Accommodations for 26 officers and 381 men; one barrack for 3 companies and one for 3 companies and band. Two barracks in course of construction. Water supply pumped from the Black River Bay. Sewer system.

Marcy, Fort, N. Mex.—Latitude, 35° 41′; longitude, 105° 57′. Situated in the town of Santa Fe, which is the post-office, telegraph, and railroad station. Reservation, about 17½ acres. Present garrison, headquarters and 2 companies infantry. Accommodations for 9 officers and 123 men; 2 barracks. Water supply from Santa Fe Water Company. Partial sewer system.

Marion, Fort, Fla.—Latitude, 29° 53′; longitude, 81° 17′. Situated in the town of St. Augustine, Fla., which is the post-office, telegraph, and railroad station. Reservation, about 22½ acres. No cession of jurisdiction. Not garrisoned. In charge of commanding officer St. Francis Barracks.

Mason, Fort, Cal.—Latitude, 37° 1′; longitude, 122° 20′. At Point San Jose or Black Point, on San Francisco Bay, within the limits of San Francisco. Post-office, Station A, San Francisco. Telegraph station at the post. Railroad station, San Francisco, distance, 3 miles. Street cars to post. Reservation, 55½ acres. Cession of jurisdiction by State act of March 31, 1891. Present garrison, 1 company artillery. Accommodations for 6 officers and 66 men; 1 barrack. Water supply from the Spring Valley Water Company Sewer system.

McClary, Fort, Me.—Latitude, 43°, 5′; longitude, 70° 45′. On Kittery Point, Me., 4½ miles from Portsmouth, N. H. Post-office, telegraph, and railroad station, Kittery Point, Me. Reservation, 15 acres. Cession of jurisdiction by act of Massachusetts of March 12, 1808, of Maine of July 31, 1846. Not garrisoned. In charge of ordnance sergeant.

McHenry, Fort, Md.—Latitude, 39° 15′; longitude, 76° 35′. On Whetstone Point, in the city of Baltimore, which is the post-office, telegraph, and railroad station. Reservation, 34½ acres. Cession of jurisdiction by State acts of February 27, 1816, and March 31, 1838. Present garrison, 3 batteries of artillery. Accommodations for 13 officers and 174 men; 3 barracks; 3 sets of quarters within and 10 sets without the fort. Water supply from Baltimore City waterworks. Sewer system.

McIntosh, Fort, Tex.—Latitude, 27° 30′; longitude, 99° 29′. In Webb County, on the Rio Grande, 1 mile from Laredo, which is the post-office, telegraph, and railroad station. Reservation, about 208 acres. Cession of jurisdiction by State act of December 19, 1849, and governor's deed of April 15, 1882. Present garrison, headquarters, 2 troops cavalry, and 1 company infantry. Accommodations for 12 officers and 184 men; 3 barracks; 2 corrals. Water pumped from well on bank of Rio Grande to an elevated tank and distributed through iron pipes. Surface drainage.

McKinney Fort, Wyo.—Latitude, 44° 23′; longitude, 106° 46′. On Clear Fork of Powder River, at base of Big Horn Mountains, 148 miles from Douglas City, on Fremont, Elkhorn and Missouri Valley Railroad. One hundred and sixty miles from Custer Station, Mont., on Northern Pacific Railroad, and 90 miles from Moorcroft, Wyo., on Burlington and Missouri Railroad. Daily stage from each. Post-office and telegraph station at the post. Reservation, 39 square miles. Cession of jurisdiction by state act of February 17, 1893. Present garrison, headquarters, 3 companies infantry, and 2 companies cavalry. Accommodations for 20 officers; 6 barracks; 4 cavalry stables. Water pumped from Clear Fork of Powder River into a tank and distributed by pipes. Surface drainage.

McPherson, Fort, Ga.—Latitude, 33° 48′; longitude, 84° 31′. Situated south of and 4 miles from the center of the city of Atlanta, Ga., which is the post-office, telegraph, and railroad station. Reservation, 236.41 acres. Cession of jurisdiction by State acts of September 14, 1885, and November 19, 1886. Present garrison, headquarters and 5 batteries artillery. Accommodations for 30 officers and 404 men; 8 barracks. Water supply pumped from 2 nonflowing artesian wells to elevated tank and distributed by system of iron pipes. Sewer system.

Meade, Fort, S. Dak.—Latitude, 44° 25′; longitude, 103° 28′. In Meade County, 3 miles from Sturgis, on the Fremont, Elkhorn and Missouri Valley Railroad, and 797 miles from St. Paul. Post-office at the post. Telegraph and railroad station, Sturgis, S. Dak. Post reservation, about 12½ square miles. Wood and timber reservation of 27,293 acres. Cession of jurisdiction by constitution of South Dakota. Small addition to reservation purchased in 1889 for increasing water supply. Present garrison, headquarters and 7 troops cavalry. Accommodations for 25 officers and 566 men; 10 barracks and 1 band barrack; 8 cavalry stables. Water comes from

springs, and is pumped into a reservoir and distributed by iron pipes. Surface drainage.

Mifflin, Fort, Pa.—Latitude, 39° 53′; longitude, 75° 13′. On Mud Island, Delaware River, 5 miles from Philadelphia, which is the post-office, telegraph, and railroad station. Reservation, about 317 acres. Cession of jurisdiction by State act of April 15, 1795. Not garrisoned. In charge of ordnance sergeant.

Missoula, Fort, Mont.—Latitude, 46° 50′; longitude, 114° 50′. On Bitter Root River, 1 mile from Bitter Root, on the Missouri and Bitter Root Valley branch of the Northern Pacific Railroad, 4 miles from Missoula, Mont., on the Northern Pacific Railroad, and 1,254 miles from St. Paul. Post-office at the post; telegraph and railroad (Northern Pacific) station, Missoula. Reservation, 640 acres, and 560 acres, not reserved, held by military occupancy. Post not on reservation. Wood and timber reserve, 1,677.41 acres, 6 miles southeast of post. No cession of jurisdiction. Present garrison, headquarters and 3 companies infantry. Accommodations for 13 officers and 243 men; 4 barracks. Water supply pumped from Bitter Root River and distributed through pipes by direct pressure or from a tank. Surface drainage.

Monroe, Fort, Va.—Latitude, 37°; longitude, 76° 18′. Situated at Old Point Comfort, commanding the entrance to Hampton Roads. Post-office and telegraph station at the post. Steamers daily from Baltimore, Washington, Norfolk, and New York, and railroad (Chesapeake and Ohio) from Richmond. Reservation, about 267 acres. Cession of jurisdiction by State act of March 1, 1821, and governor's deed of April 8, 1871. But cession does not include the 15 acres in Elizabeth City County acquired February 12, 1841, for a pumping station. Present garrison, 8 batteries artillery. Accommodations for 55 officers (14 in casemates) and 366 men; 1 barrack for 6 batteries and 2 barracks in Carroll Hall. Water supply pumped from a system of driven wells. Sewer system constructed by engineers considered defective. Act of March 2, 1889, appropriated $25,000 for a new sewer system, but no action has been taken so far as known to this office.

Montgomery, Fort, N. Y.—Latitude, 45°; longitude, 73° 20′. Situated on Rouses Point, N. Y., 191 miles from Albany, N. Y. Post-office, telegraph, and railroad station, Rouses Point, N. Y., 1¼ miles from the post. Reservation, 600 acres. Cession of jurisdiction by State acts of March 31, 1815, April 21, 1818, and April 21, 1840, and governor's deed of May 15, 1818, and commissioner's deed of July 6, 1818. Not garrisoned. In charge of ordnance sergeant.

Morgan, Fort, Ala.—Latitude, 30° 14′; longitude, 88°. Situated on Mobile Point, 30 miles from Mobile. Post-office, Herndon, Ala. Telegraph station at the post. Steamer from Mobile. Reservation, 322.42 acres. Cession of jurisdiction by State act of February 18, 1891. Not garrisoned. In charge of ordnance sergeant.

Moultrie, Fort, S. C.—Latitude, 32° 45′; longitude, 79° 51′. On Sullivans Island, 5 miles from Charleston. Post-office, Moultrieville, S. C. Telegraph and railroad station, Charleston, S. C. No reservation; 4 acres held. Cession of jurisdiction by State acts of December 19, 1805, December 18, 1846, and December 19, 1848. Not garrisoned. In charge of ordnance sergeant.

Mount Vernon Barracks, Ala.—Latitude, 31° 12′; longitude, 88° 2′. At the town of Mount Vernon, 28 miles north of Mobile. Post-office, telegraph, and railroad station, Mount Vernon, Ala., one-half mile from the post. Reservation, about 1,600 acres. Cession of jurisdiction by State act of February 1, 1891. Present garrison, 3 companies infantry. Accommodations for 11 officers and 124 men; 2 barracks. Water supply raised by steam pump from reservoir fed by springs and distributed by iron pipes. Sewer system. Both water and sewer systems are in course of thorough reconstruction.

Myer, Fort, Va.—Latitude, 38° 53′; longitude, 77° 3′. On Arlington Heights, 4 miles from the Capitol building, Washington. Post-office and railroad station, Washington, D. C. Telephone to post. Reservation for the post, 186 acres, a portion of the Arlington estate, the area of which is 1,073.4 acres. Cession of jurisdiction by State acts of February 23, 1884, and March 25, 1884. Present garrison, 4 troops of cavalry. Accommodations for 14 officers and 289 men; 4 barracks; 4 cavalry stables. Sewer system. Water supply from 3 dug and 12 driven wells, and from Potomac River.

Newport Barracks, Ky.—Latitude, 39° 5′; longitude, 84° 29′. On the south bank of the Ohio River, at the junction of the Licking River, in the city of Newport. Post-office, telegraph, and railroad station, Newport. Reservation, about 6 acres. Cession of jurisdiction by State act of February 29, 1888. Present garrison, 1 company infantry. Accommodations for 5 officers and 62 men; 1 barrack for 2 companies; originally quarters for 10 officers and 2 companies infantry. Sale of old post authorized by Congress. Water supply, Newport city waterworks. Sewer system.

Niagara, Fort, N. Y.—Latitude, 43° 18′; longitude, 79° 8′. On the Niagara River, at its junction with Lake Ontario, 14 miles below Niagara Falls, 7 miles from Lewiston, N. Y., and 36 miles from Buffalo, N. Y. Post-office, Youngstown, N. Y. Telegraph and railroad station, Lewiston, N. Y. Reservation, 288½ acres. Cession of

jurisdiction by State act of April 21, 1840, and commissioner's deed of July 8, 1846. Present garrison, headquarters, 3 companies infantry. Accommodations for 13 officers and 244 men; 4 barracks. Water supply pumped from the Niagara River and distributed through a system of iron pipes. Sewer system.

Niobrara, Fort, Nebr.—Latitude, 42° 53′; longitude, 100° 46′. On the Niobrara River, 4½ miles from Valentine, on the Fremont, Elkhorn and Missouri Valley Railroad. Post-office and telegraph station at the post. Reservation, 54 square miles, 452 acres. Cession of jurisdiction by State act of March 29, 1889. Present garrison, headquarters, 6 companies cavalry and 2 infantry; 6 cavalry stables. Accommodations for 27 officers and 461 men; 9 barracks. Water comes from springs, and is pumped into tanks and distributed by gravity. Sewer system.

Oglethorpe, Fort, Ga.—Latitude, 32° 2′; longitude, 80° 34′. On the west bank of the Savannah River, 3 miles below the city of Savannah, which is the post-office, telegraph, and railroad station. Reservation 200 feet on the Savannah River, running back 345 feet. Cession of jurisdiction by State act of December 22,1808. Not garrisoned. In charge of ordnance sergeant.

Oklahoma, Camp at, Okla.—Latitude, 35° 27′; longitude, 97° 30′. On Southern Kansas branch of Atchison, Topeka and Santa Fe Railroad, 32 miles from Fort Reno. Post-office, telegraph, and railroad station, Oklahoma City. Reservation, 160 acres. Present garrison, 1 company infantry. Accommodations for 4 officers and 71 men; 1 barrack. No water or sewer system. Turned over to Interior Department, but still in charge of custodian paid by Quartermaster's Department.

Omaha, Fort, Nebr.—Latitude. 41° 20′; longitude, 96°. Within the limits of the city of Omaha. Post-office and telephone at the post. Railroad station, Omaha. Reservation (old), 82.50 acres. Present garrison, all of Second Infantry. Accommodations for 26 officers and 487 men; 11 barracks. Water supply from American Water Works Company. Partial sewer system. Act of July 23, 1888, authorized sale of Fort Omaha and purchase of a new site of not less than 320 nor more than 640 acres. (See Fort Crook.)

Omaha Depot, Nebr.—Latitude, 41° 20′; longitude, 96°. In Omaha City. Reservation, 5 acres.

Ontario, Fort, N. Y.—Latitude. 43° 27′; longitude, 76° 30′. On the Oswego River, at its junction with Lake Ontario, adjoining the city of Oswego, which is the post-office, telegraph, and railroad station. Reservation about 76 acres. Cession of jurisdiction by State act of April 25, 1839, and commissioner's deed of August 15, 1839. Present garrison, 1 company infantry. Accommodations for 4 officers and 63 men; 1 barrack. Water supply from Oswego waterworks. Sewer system.

Pembina, Fort, N. Dak.—Latitude, 48° 57′; longitude, 97° 12′. On the Red River of the North, 2 miles from Pembina, on the Winnipeg branch of the Northern Pacific Railroad. Post-office, telegraph, and railroad station, Pembina. Reservation, about 1,920 acres. Cession of jurisdiction by constitution of North Dakota. Present garrison, 1 company infantry. Accommodations for 7 officers and 104 men; 2 barracks. Water supply pumped to tank and distributed through iron pipes, Surface drainage.

Phœnix, Fort, Mass.—Latitude, 41° 38′; longitude, 70° 55′. At Fort Point, Mass. Post-office, telegraph, and railroad station, Fairhaven, Mass. Reservation, 2 acres. Not garrisoned. In charge of ordnance-sergeant.

Pickens, Fort, Fla.—Latitude, 30° 19′; longitude, 87° 17. On Santa Rosa Island, 10 miles from Pensacola. Post-office, Warrington, Fla. Telegraph station, Pensacola navy-yard. Railroad station, Pensacola. Reservation, all of Santa Rosa Island (unsurveyed). No cession of jurisdiction. Not garrisoned. In charge of ordnance-sergeant.

Pike, Fort, La.—Latitude, 30° 11′; longitude, 89° 38′. On Petites Coquille Island, 7 miles from Lake Catherine station, on the Louisville and Nashville Railroad, Post-office at the post. Telegraph station, Millers Bayou, La. Reservation, all the public land within 1,200 yards of the post. Cession of jurisdiction by State act of June 1, 1846. Not garrisoned.

Pittsburg, Pa.—Latitude, 40°, 32′; longitude, 80° 5′. Reservation part of old site of Fort Fayette. Fronts over 100 feet on Penn street, running back to the Allegheny River. Sale authorized by act of May 21, 1890. (Public No. 125.) Sale not yet effected.

Pilot Butte, Camp, Wyo.—Latitude, 41° 12′; longitude, 111°. Post-office, telegraph, and railroad station, Rock Springs, Wyo. No reservation. Cession of jurisdiction by State act of February 17, 1893. Present garrison, 1 company infantry. Accommodations for 6 officers and 96 men; 2 barracks. Buildings belong to and are kept in repair by the Union Pacific Railroad Company. Water furnished by Green River Water Company and paid for by the Union Pacific Railroad Company.

Plattsburg Barracks, N. Y.—Latitude 44° 41′; longitude, 73° 25′. On west shore of Lake Champlain, at the town of Plattsburg. Post-office, telegraph, and railroad station, Plattsburg, N. Y. Reservation about 173 acres. Cession of jurisdiction by State act of March 6, 1890. In addition to which 506.35 acres have been acquired

under the provisions of act of February 7, 1891. Present garrison, 1 company infantry. Accommodations for 18 officers; 1 barracks for 2 companies, and one for 4 companies. Four sets officers' quarters and barrack wing for 4 companies in course of construction. Water supply, Plattsburg waterworks. Sewer system.

Popham, Fort, Me.—Latitude, 43° 50′; longitude 69° 55′. On Hunniwell Point, 12 miles by water and 15 by land from Bath. Post-office, Popham Beach, Me. Telegraph and railroad station, Bath. Reservation, 2½ acres. Cession of jurisdiction by State act of April 7, 1857, and January 9, 1862. Not garrisoned. In charge ordnance-sergeant.

Poplar River, Camp, Mont.—Latitude, 48° 6′; longitude 105° 12′. Situated at Montana, Poplar River station of Great Northern Railroad, 730 miles from St. Paul. Post-office, telegraph, and railroad station, Poplar River Station. On Indian Reservation. Cession of jurisdiction by constitution of State of Montana. Present garrison, 2 companies infantry. Accommodations for 6 officers and 102 men; 2 barracks. No water system. To be abandoned.

Porter, Fort, N. Y.—Latitude 42° 53′; longitude, 78° 52′. On the right bank of the Niagara River, within the limits of the city of Buffalo, which is the post-office, telegraph, and railroad station. Reservation about 28½ acres. Cession of jurisdiction by State acts of April 21, 1840, February 28, 1842, April 12, 1842, February 9, 1844, and governor's deed of October 17, 1853. Present garrison, 2 companies infantry. Accommodations for 9 officers and 124 men; 1 barrack for 2 companies. Water supply, Buffalo City waterworks. Sewer system.

Preble, Fort, Me.—Latitude, 43° 3′; longitude, 70° 14′. On the east side of Portland Harbor, at Spring Point, 2 miles from the city of Portland, which is the post-office, telegraph, and railroad station. Reservation, about 24 acres. Cession of jurisdiction by act of Massachusetts of March 12, 1808, and general act of Maine of February 18, 1871. Present garrison, 1 battery artillery. Accommodations for 5 officers and 65 men; 1 barrack. Water supply from mains of Sebago Water Company. Sewer system.

Presidio of San Francisco, Cal.—Latitude, 37° 47′; longitude, 122° 26′. In the northwestern suburbs of San Francisco. Post-office and telegraph station at the post. Railroad station, San Francisco, 4¼ miles from the post. City railway to the post. Reservation, 1,479.94 acres. Cession of jurisdiction by State act of March 31, 1891. Present garrison, headquarters, 6 batteries of artillery, 1 troop of cavalry. Accommodations for 39 officers and 562 men; 12 barracks; 5 cavalry and artillery stables. Water supply from the Spring Valley Water Company, pumped by steam power and windmills to reservoir. Sewer system.

Pulaski, Fort, Ga.—Latitude, 32° 2′; longitude, 80° 34′. On Cockspur Island, 14 miles from Savannah, which is the post-office, telegraph, and railroad station. Reservation not surveyed. Cession of jurisdiction by State acts of December 22, 1808, and December 27, 1845. Not garrisoned. In charge of ordnance-sergeant.

Randall, Fort, S. Dak.—Latitude, 43° 1′; longitude, 98° 35′. On the Missouri River, opposite White Swan, 24 miles from Armour, S. Dak., and 45 miles from Springfield, on the Chicago, Milwaukee, and St. Paul Railroad. Post-office at the post. Telegraph and railroad station, Armour. Stage and mail daily, except Sunday, from Armour. Communication with Running Water, S. Dak. (36 miles), by wagon transportation. Reservation, about 144 square miles. Cession of jurisdiction by constitution of South Dakota. Accommodations for 14 officers and 244 men; 5 barracks. Water for domestic purposes pumped from the river and distributed by water wagons. Water for other purposes supplied from artesian well. Surface drainage. Abandoned. To be turned over to Interior Department. In charge of paid custodian.

Red Bank, N. J.—Latitude, 40° 25′; longitude, 74° 1′. On east shore of Delaware River, 8 miles below Philadelphia. Reserve, 100 acres. Cession of jurisdiction by State act of March 12, 1873.

Reno, Fort, Okla.—Latitude, 35° 35′; longitude, 98° 1′. On the North Fork of the Canadian River, 32 miles from Oklahoma Station, on the Atchison, Topeka and Santa Fe Railroad. Post-office and telegraph station at the post. Daily stage from El Reno, Okla., on Chicago, Rock Island and Pacific Railroad, 5¼ miles from the post. Reservation, 9,493 acres, and wood reserve of 9 square miles. Present garrison, headquarters, 4 companies cavalry and 2 companies infantry. Accommodations for 18 officers and 394 men; 7 barracks, 5 cavalry stables. Water supply pumped from North Fork of the Canadian River into wooden tanks and distributed through iron pipes. The water is generally muddy and alkaline. For domestic purposes for the officers, water is hauled from Caddo Springs. Artesian well now being sunk. Sewer system.

Riley, Fort, Kans.—Latitude, 39° 4′; longitude, 96° 47′. On Kansas River, 3½ miles from Junction City, on the Missouri, Kansas and Texas Railroad. Post-office, telegraph, and railroad stations at the post. Reservation, 19,899.22 acres. Cession of jurisdiction by State acts of February 23, 1872, and February 14, 1889. Present gar-

rison, headquarters, 8 troops cavalry and 3 batteries artillery, Accommodations for 46 officers and 736 men; 14 barracks; 8 cavalry and 5 artillery stables. Water pumped from 8 Wagner tubular wells to reservoir and distributed by a system of iron pipes. Sewer system.

Ringgold, Fort, Tex.—Latitude, 26° 23′; longitude, 98°, 47′. On the Rio Grande, 23 miles from San Miguel, on Mexican National Railroad. Post-office, Rio Grande City, Tex. Telegraph station at the post. Stage from Brownsville, 117 miles; from Pena, 76 miles, on Texas Midland Railroad, and from San Miguel, Mexico. Reservation, 350 acres. Cession of jurisdiction by State act of December 19, 1849, and governor's deed of April 14, 1882. Present garrison, 1 company infantry and 2 troops cavalry. Accommodations for 11 officers and 203 men; 4 barracks. One set officers quarters reported unfit for use. Two corrals. Water supply is pumped from the Rio Grande to reservoirs and distributed through pipes. Sewer system.

Robinson, Fort, Nebr.—Latitude, 42° 40′; longitude, 103° 28′. On White River, on line of Fremont, Elkhorn and Missouri Valley Railroad. Post-office, telegraph, and railroad station at the post. Post reserve, 20 square miles. Wood and timber reserve, 16 square miles. Cession of jurisdiction by State act of March 29, 1889. Present garrison, headquarters, 6 troops cavalry and 2 companies infantry. Accommodations for 37 officers and 540 men; 11 barracks. Nine officers quarters and 3 barracks reported worthless; 6 cavalry stables. Water pumped from springs to an elevated tank and distributed by iron pipes. Sewer system.

St. Francis Barracks, Fla.—Latitude, 29° 53′; longitude, 81° 17′. Southeast of and adjoining St. Augustine, Fla., near the Matanzas River. Post-office, telegraph, and railroad station, St. Augustine. Reservation proper, about 5½ acres. Powder-house lot, about 11 acres. In addition to which two islands in the Matanzas River were reserved by Executive authority of May 31, 1892, containing 1.96 and 0.04 acres respectively, and about 700 acres on Anastasia Island, by Executive authority of May 4, 1893. Present garrison, headquarters, and 2 companies infantry. Accommodations for 9 officers and 99 men; 3 barracks. Water supply raised from an artesian well by hydraulic ram; 5 cisterns also in use. Sewer system.

St. Louis Arsenal, Mo.—Latitude, 38° 28′; longitude, 90° 17′. In the city of St. Louis, on the Missouri River. Reservation, 31.8 acres. St. Louis clothing depot. Water supply from city of St. Louis waterworks.

St. Philip, Fort, La.—Latitude, 29° 25′; longitude, 89° 30′. Post-office, Neptune, La.; telegraph station, Quarantine, La. Steamer triweekly from New Orleans, 73 miles, and from Bohemia, on New Orleans and Gulf Railroad; distance, 25 miles. Reservation, 640 acres. Cession of jurisdiction by State act of June 1, 1846. Not garrisoned. In charge of ordnance sergeant.

Sam Houston, Fort, Tex.—Latitude, 29° 27′; longitude, 98° 28′. In Bexar County, 1 mile north of San Antonio, which is the post-office, telegraph, and railroad station. Reservation, 469.23 acres. Cession of jurisdiction by State act of December 19, 1849, and governor's deeds of June 23, 1870, June 4, 1883, August 17, 1883, and April 19, 1887. Present garrison, 3 troops cavalry, 2 batteries artillery, and headquarters and 6 companies infantry. Accommodations for 26 officers and 742 men; 12 barracks, and 1 band barrack. Additional quarters for 15 officers at department headquarters. Six cavalry stables. Water supply, San Antonio Water Company. Drainage by means of a system of vitrified pipes.

San Carlos, Ariz.—Latitude, 33° 10′; longitude, 110° 25′. On the Gila River, within the limits of the White Mountain Indian Reservation, 102 miles from Bowie and 106 miles from Wilcox on the Southern Pacific Railroad. Post-office and telegraph station at the post. Daily stage, except Sunday, from Bowie, via Fort Thomas. Present garrison, 1 troop of cavalry and 2 companies infantry. Temporary quarters for 12 officers. Accommodations for 180 men; 4 tents on frames; corrals for 2 troops cavalry. Water supply pumped from well near San Carlos River into tanks and distributed through pipes. Natural drainage.

San Diego Barracks, Cal.—Latitude, 32° 43′; longitude, 117° 9′. In the city of San Diego, Cal. Post-office, telegraph, railroad station, and boat landing, San Diego, Reservation, 2 blocks, 200 by 300 each, and wharf lot, 75 by 1,000. Cession of jurisdiction by State act of March 31, 1891. Present garrison, 1 company infantry; accommodations for 52 men, 1 barrack. Officers' quarters rented in San Diego. Water supply from San Diego Water Company. Sewer system connected with city sewers.

Sandy Hook, Fort at, N. J.—Latitude, 40° 25′; longitude, 74° 1′. Post-office, New York City; distance, 22 miles. Telegraph, railroad station, and steamboat landing at Sandy Hook; distance, 2 miles. Reservation, about 1,366 acres. Cession of jurisdiction by State act of March 12, 1846. Not garrisoned. In charge of ordnance sergeant.

San Juan Island, Wash.—Latitude, 48° 37′; longitude, 123°. Reservation, about 640 acres.

San Pedro Cal.—Latitude, 33° 40′; longitude, 118° 40′. In San Pedro Bay. Reservation, 44.25 acres, more or less.

Scammel, Fort, Me.—Latitude, 48° 39′; longitude, 79° 13′. In Portland Harbor, 2 miles from Portland, which is the post-office, telegraph, and railroad station. Reservation, 11 acres. Cession of jurisdiction by act of Massachusetts of March 12, 1808. Not garrisoned. In charge of ordnance sergeant.

Schuyler, Fort, N. Y.—Latitude, 40° 49′; longitude, 73° 48′. On Throggs Neck 3½ miles from Westchester, and 17 miles from New York City. Post-office, telegraph, and railroad station, Westchester, N. Y. Reservation, 52 acres. Cession of jurisdiction, none or doubtful. State act of March 31, 1815, apparently authorizes cession to be made by commissioner's deed, but no record of deed is found. State act of May 7, 1880, cedes as to water-covered lands only. Present garrison, 2 batteries artillery. Accommodations for 9 officers and 63 men; 1 barrack and 2 detached squad rooms. Water supply from New York and Westchester Water Company. Sewer system.

Sequoia National Park, Cal. (Camp at Mineral King).—Post-office, Three Rivers, Cal. Telegraph station, Visalia, Cal. Private conveyance to camp from Exeter station, 48 miles, on Southern Pacific Railroad. Present garrison, 1 troop cavalry.

Sewall, Fort, Mass.—Latitude, 42° 30′; longitude, 70° 33′. Situated 1½ miles from Marblehead, which is the post-office, telegraph, and railroad station. Reservation, small tract and in litigation. Not garrisoned. In charge of town of Marblehead, Mass., by authority of act of Congress (Public, No. 19 of 1890).

Sheridan, Fort, Ill.—Latitude, 42° 14′; longitude, 89° 30′. On Lake Michigan, 25 miles north of Chicago. Post-office, telegraph, and railroad station at the post. Reservation, 632½ acres. Cession of jurisdiction by State act of June 6, 1887. Present garrison, 1 company artillery, 2 troops cavalry and all of fifteenth infantry. Accommodations for 43 officers and 724 men; 12 barracks, 5 cavalry stables. Water supply pumped from Lake Michigan into reservoir and distributed by a system of iron pipes. Sewer system.

Sherman, Fort, Idaho.—Latitude, 47° 42′; longitude, 116° 38′. On Cœur d'Alene Lake, at its outlet, Spokane River, one-half mile from the Cœur d'Alene branch of Northern Pacific Railroad. Post-office, Sherman; telegraph and railroad station, Cœur d'Alene, Idaho. Reservation, 688.65 acres. Cession of jurisdiction by State act of February 7, 1891. Present garrison, headquarters, 1 troop cavalry, and 4 companies infantry. Accommodations for 18 officers and 264 men, 5 barracks, and 1 band barrack; 1 cavalry stable. Water supply pumped from Spokane River. No sewer system.

Ship Island, Fort at, Miss.—Latitude, 30° 20′; longitude, 89° 7′. Situated 15 miles from Biloxi, which is on the Louisville and Nashville Railroad. Post-office, telegraph, and railroad station, Biloxi, Miss. Special boat to post. No cession of jurisdiction. Not garrisoned. In charge of ordnance sergeant.

Sidney, Fort, Nebr.—Latitude, 41° 9′; longitude. 102° 58′. On Lodge Pole Creek, adjoining the town of Sidney, Cheyenne County, on the Union Pacific Railroad. Post-office, telegraph, and railroad station, Sidney, Nebr. Post reservation, 1 square mile. Timber reservation, 5 square miles. Cession of jurisdiction by State act of March 30, 1889. Present garrison, 4 companies infantry. Accommodation for 15 officers and 245 men; 5 barracks. Water supply pumped from a well to a tank and distributed by iron pipes. Surface drainage.

Sill, Fort, Okla.—Latitude, 34° 40′; longitude, 98° 23′. On Medicine Bluff Creek, 65 miles from Henrietta, Tex., on the Denver and Fort Worth Railroad. Post-office and telegraph station at the post. Daily stage, except Sunday, from Henrietta, Tex., and from Chickaska, Ind. T., on the Chicago, Rock Island and Pacific Railroad, distance 39 miles. On Indian lands, 36 square miles reserved. In addition to which General Order 43, 1892, sets aside a wood reserve of 26,880 acres. Present garrison, headquarters, 3 troops cavalry and 2 companies infantry. Accommodations for 20 officers, 8 companies; 4 double barracks and 1 single barrack; 10 cavalry stables. Water supply raised by steam pump from a reservoir fed by springs on Medicine Bluff Creek, and distributed from tanks by a system of pipes. Sewer system.

Snelling, Fort, Minn.—Latitude, 44° 53′; longitude, 93° 11′. At the junction of the Minnesota and Mississippi rivers, on Chicago, Milwaukee and St. Paul Railroad, 7 miles from St. Paul, and 8 miles from Minneapolis by the course of the river. Post-office, telegraph, and railroad station at the post. Reservation, 1,531.21 acres. Cession of jurisdiction by act of April 24, 1889. Present garrison, headquarters and 7 companies infantry. Accommodations for 36 officers (1 additional at ordnance depot) and 486 men; 8 barracks. Water supply pumped from a spring by steam pump and distributed from reservoir by system of iron pipes. Sewer system.

Spokane, Fort, Wash.—Latitude, 47° 50′; longitude, 118° 18′. On the Spokane River, three-fourths of a mile from its junction with the Columbia, near Miles, Wash., 25 miles from Davenport and 50 miles from Sprague, on Northern Pacific Railroad. Post-office and telegraph station, Miles, Wash. Daily stage, except Sunday, from Davenport. Reservation, 640 acres. Cession of jurisdiction by constitution of Washington. Present garrison, 4 companies infantry. Accommodations for 19 officers and

364 men; 6 barracks and 1 cavalry stable. Water supply pumped from Spokane River, except that for drinking purposes, which is supplied from a spring through another set of pipes. Sewer system.

Stanton, Fort, N. Mex.—Latitude, 33° 30′; longitude, 105° 32′. On the Rio Bonito, Lincoln County, 8 miles from Lincoln and 100 miles from Carthage, on Atchison, Topeka and Santa Fé Railroad. Post-office and telegraph station at the post. Daily stage from Carthage. Reservation, 16 square miles. Present garrison, 2 companies infantry. Accommodations for 13 officers and 292 men; 5 barracks and 3 cavalry stables. Water supply pumped from a well about 100 feet from the Rio Bonita, and distributed from a reservoir by iron pipes. Partial sewer system.

Stevens, Fort, Oregon.—Latitude, 46° 31′; longitude, 125° 1′. On Point Adams, Columbia River, 7 miles from Astoria, 105 from Portland. Post-office, telegragh station, Astoria, Oregon, telephone to post. Steamer daily from railroad station, Portland to Astoria, thence by steam tug daily, except Sunday, to post. Reservation, 640 acres. No cession of jurisdiction. Not garrisoned. Transferred to Engineer Department and in charge of ordnance sergeant. Four sets officers' quarters and 1 barrack.

Sully, Fort, S. Dak.—Latitude, 44° 20′; longitude, 100° 10′. On the Missouri River, 23½ miles from Pierre, on the Chicago and Northwestern Railroad. Post-office and telegraph station at the post. Railroad station, Pierre. Daily stage, except Sunday, to post. Reservation, about 27,000 acres. Cession of jurisdiction by constitution of South Dakota. Present garrison, 3 companies infantry. Accommodations for 13 officers and 203 men; 4 barracks. Water supply pumped from a drive-well gallery, about three-fourths of a mile from the Missouri River, to a reservoir, and distributed through iron pipes. Surface drainage.

Sumter, Fort, S. C.—Latitude, 32° 45′; longitude, 79° 51′. In Charleston Harbor, 5 miles from Charleston. Post-office, Moultrieville, S. C. Telegraph and railroad station, Charleston. Reservation, about 125 acres. Cession of jurisdiction by State joint resolution of December 21, 1836. Not garrisoned. In charge of ordnance sergeant.

Supply, Fort; Ind. T.—Latitude, 36° 30′; longitude, 99° 30′. Fifteen miles from Woodward, on the Southern Kansas Railroad. Post-office and telegraph station at the post. Railroad station, Woodward. Daily stage to post. Post reservation, 36 square miles. Wood and water reservation, 27 square miles, all on Indian lands. Present garrison, 1 troop of cavalry and 3 companies infantry. Accommodations for 17 officers and 390 men; 7 barracks; 3 cavalry stables. Water supply from springs on Water Cress Canyon, about 2½ miles north of the post. Sewer system.

Taylor, Fort, Fla.—Latitude, 24° 33′; longitude, 81° 49′. Near Whitehead Point, 1 mile from Key West, which is the post-office, telegraph station, and boat landing. Reservation, 62.89 acres. Cession of jurisdiction by State acts of July 8 and July 24, 1845. Not garrisoned. In charge of ordnance sergeant.

Thomas, Fort, Ky.—Latitude, 39° 5′; longitude, 84° 29′. Three miles from Newport, on the highlands overlooking the Ohio River. Post-office, telegraph, and railroad station, Newport. Reservation, 111 acres, 2 roods, 39 poles. Rifle range, 169 acres. Cession of jurisdiction by State act of February 29, 1888. Present garrison, headquarters and 6 companies of infantry. Accommodations for 21 officers and 288 men; 3 double barracks and 1 band barrack. Water supplied by Covington city waterworks. Sewer system.

Townsend, Fort, Wash.—Latitude, 48° 7′; longitude, 122° 44′. At the entrance to Puget Sound, 3 miles from Port Townsend, 66 miles from Seattle, 93 from Tacoma, and 130 from Olympia. Post-office and telegraph station, Port Townsend. Reservation, 615.1 acres. Cession of jurisdiction by constitution of Washington. Present garrison, 1 company infantry. Accommodations for 5 officers and 87 men; 2 barracks. Water supply pumped from springs by steam power. Natural drainage.

Trumbull, Fort, Conn.—Latitude, 41° 21′; longitude, 72° 6′. On the right bank of the Thames River, 1 mile below the city of New London, which is the post-office, telegraph, and railroad station. Reservation, 13½ acres. Cession of jurisdiction by act of June 9, 1842. Present garrison, 1 battery artillery. Accommodations for 8 officers (4 in casemates) and 71 men; 2 barracks. Water supply from New London city waterworks. Sewer system.

Union, Fort, N. Mex.—Latitude, 35° 54′; longitude, 105° 9′. In Moro County, 9 miles from Watrous, on the Atchison, Topeka and Santa Fe Railroad. Post reservation, 51½ square miles. Timber reservation, 53 square miles. Accommodations for 30 officers and 349 men; additional accommodations at arsenal for 3 officers and 1 troop cavalry. Water supply pumped by steam power. Natural drainage. The reservation is within the limits of the Moro grant, for which a land patent was issued to claimants in 1876. Not garrisoned. In charge of paid custodian.

Vancouver Barracks, Wash.—Latitude, 45° 40′; longitude, 125° 32′. On the north bank of the Columbia River, 18 miles by water and 6 miles in a direct line from Portland. Post-office and steamboat landing at Vancouver. Reservation, 640 acres.

Cession of jurisdiction by constitution of Washington. Present garrison, 1 troop cavalry, headquarters, and 6 companies infantry. Accommodations for 26 officers and 528 men; 10 barracks and 1 band barrack. One cavalry stable. Additional accommodations for 14 officers and 2 noncommissioned officers at department headquarters and depot. Water supply pumped from an artesian well to a reservoir and distributed by gravity. Sewer system.

Wadsworth, Fort, N. Y. Harbor.—Latitude, 40° 37′; longitude, 74° 3′. On Staten Island, commanding the Narrows, entrance to New York Harbor. Post-office, Rossbank, Staten Island, N. Y. Telegraph and quarantine station, Clifton, Staten Island. Reservation, about 100 acres. Cession of jurisdiction by State acts of February 6, 1836, April 15, 1857, April 18, 1861, February 20, 1862, and (as to water-covered lands) by act of May 7, 1880, and by commissioner's deed of February 15, 1847. Present garrison, 3 batteries of artillery. Accommodations for 15 officers and 183 men. No barracks; batteries quartered in casemates. Water supply from Crystal Water Company. Sewer system.

Wallawalla, Fort, Wash.—Latitude, 46° 6′; longitude, 118° 24′. One mile from Wallawalla, on the Northern Pacific Railroad. Post-office, telegraph, and railroad station, Wallawalla, Wash. Reservation, about 613 acres. Cession of jurisdiction by constitution of Washington. Present garrison, headquarters and 4 troops cavalry. Accommodations for 16 officers and 260 men; 6 barracks; 4 cavalry stables. Water supply from springs on leased ground 1¼ miles from the post, distributed by gravity. Sewer system.

Warren, Fort, Mass.—Latitude, 42° 19′; longitude, 70° 59′. On Georges Island, in Boston Harbor, 7 miles from Boston. Post-office and telegraph station, Boston. Daily steamer. Reservation, the whole island, about 18 acres. Cession of jurisdiction by State act of February 7, 1846. Present garrison, 2 batteries artillery. Accommodations for 11 officers (8 in casemates) and men in casemates. Water supply from 10 cisterns and 4 wells. New water system, by connection with Boston mains, in course of construction. Sewer system.

Washakie, Fort, Wyo.—Latitude, 42° 59′; longitude, 108° 54′. On the Little Wind River, 147 miles from Rawlings, on the Union Pacific Railroad. Post-office and telegraph station at the post. Daily stage from Rawlings. Reservation, 1,405 acres, on Indian lands. Cession of jurisdiction by State act of February 17, 1893. Present garrison, 1 troop cavalry and 2 companies infantry. Accommodations for 9 officers and 158 men; 3 barracks and one cavalry stable. Water pumped to tank by steam power from south fork of Little Wind River, and distributed by iron pipes. No sewer system.

Washington Barracks, D. C.—Latitude, 38° 53′; longitude, 77° 3′. On Greenleaf Point, D. C. Post-office, telegraph, and railroad station, Washington, D. C. Reservation, about 69 acres. Cession of jurisdiction by State act of Maryland December 19, 1791, ceding the District of Columbia to United States. Present garrison, headquarters and 5 batteries artillery. Accommodations for 24 officers and 312 men; 2 barracks for 3 batteries each. Water supply, Washington city waterworks, owned by the United States. Sewer system.

Washington, Fort, Md.—Latitude, 38° 43′; longitude, 77° 6′. On the Potomac River, 13 miles from Washington, D. C. Post-office at the post. Telegraph and railroad station, Alexandria, Va. Steamboat from Washington. Reservation, about 50 acres. Cession of jurisdiction by State act of April 11, 1874. Not garrisoned. In charge of ordnance sergeant.

Wayne, Fort, Mich.—Latitude, 42° 23′; longitude, 82° 58′. On Detroit River, 3½ miles from city hall in Detroit, which is the post-office and telegraph station. City railway to the post. Reservation, about 63 acres. Cession of jurisdiction by State act of February 9, 1842. Present garrison, headquarters and 4 companies infantry. Accommodations for 15 officers and 231 men; 1 barrack crowded for 4 companies and band. Water supply from Detroit city waterworks. Sewer system.

West Point, N. Y.—Latitude, 41° 23′; longitude, 74° 41′. On the west bank of the Hudson River, 51 miles above New York City. Post-office, telegraph, and railroad station at the post. Reservation, 2,330 acres. Cession of jurisdiction by State acts of March 2, 1826, May 15, 1875, May 25, 1876, May 15, 1888; and as to Round Pond and right of way, etc., for water supply, by acts of April 21, 1879, June 14, 1880, and May 12, 1881. United States Military Academy. Accommodations for 50 officers and 312 men; 5 barracks. Present garrison, E, Engineer battalion and detachments. Water supply piped from springs by gravity and distributed from reservoir through iron pipes. Sewer system.

Whipple Barracks, Ariz.—Latitude, 34° 33′; longitude, 112° 27′. One mile from Prescott, Ariz. Post-office, Whipple; telegraph and railroad station, Prescott. Reservation, about 1,730 acres. Present garrison, headquarters and 4 companies infantry. Accommodations for 20 officers and 203 men; 5 barracks; 1 cavalry stable. Four sets quarters reported in unsafe condition and 3 barracks worthless. Water

supply pumped from a well on Granite Creek to a reservoir and distributed by iron pipes. Sewer system.

Willets Point, N. Y.—Latitude, 40° 47′; longitude, 73° 47′. On the East River, 2½ miles from Whitestone, Queens County, 17 miles from New York City. Post-office and telegraph station at the post. Railroad station, Whitestone, N. Y. Reservation, about 136.35 acres. Cession of jurisdiction by State acts of April 15, 1857, and April 17, 1875. Engineer station. Accommodations for 23 officers (11 sets officers' quarters and 12 bachelors' quarters) and 400 men; 3 double barracks and 1 band barrack. Present garrison, headquarters, A, B, C, and D, Engineer battalion. Water supply from Flushing village waterworks. Sewer system.

Winfield Scott, Fort, Cal.—Latitude, 37° 49′; longitude, 122° 48′. Golden Gate, San Francisco, Cal. Post-office and railroad station, San Francisco. Telegraph station, Presidio of San Francisco. On the Presidio reservation. Not garrisoned.

Wingate, Fort, N. Mex.—Latitude, 35° 29′; longitude, 108° 32′. Situated on Bear Spring, 3 miles from Wingate, on the Atlantic and Pacific Railroad. Post-office and telegraph station at the post. Reservation, 130 square miles. Present garrison, headquarters, 6 companies cavalry, and 1 company infantry. Accommodations for 22 officers and 400 men; 8 barracks and 8 cavalry stables, two in bad condition and occupied as shelter for pack trains, etc. Water supply pumped from a spring into a reservoir and distributed by iron pipes. Sewer system.

Winthrop, Fort, Mass.—Latitude, 42° 21′; longitude, 70° 1′. On Governors Island, Boston Harbor, 2 miles from Boston, which is the post-office, telegraph, and railroad station. Steamboat to post. Reservation, about 60 acres. Cession of jurisdiction by State acts of June 25, 1798, March 12, 1808, and February 7, 1846. Not garrisoned. In charge of ordnance sergeant.

Wood, Fort, N. Y.—Latitude, 40° 41′; longitude, 74° 11′. On Bedloe Island, in New York Harbor, 3 miles from New York City, which is the post-office, railroad, and telegraph station. Reservation, about 12 acres. Cession of jurisdiction by State acts of February 15, 1800, and (as to water-covered lands) by act of May 7, 1880. Present garrison, 1 company infantry. Accommodations for 4 officers and 52 men; 1 barrack. Water supply, 4 cisterns. Sewer system.

Yates, Fork, N. Dak.—Latitude, 46° 11′; longitude, 100° 34′. Sixty miles from Bismarck, which is on Northern Pacific Railroad. Post-office and telegraph station at post. Daily stage, except Sunday, from Bismarck. Reservation, 1 square mile, on Indian lands. Cession of jurisdiction by constitution of North Dakota. Present garrison, 3 companies infantry and 2 troops cavalry. Accommodations for 19 officers and 322 men; 6 barracks; 3 additional for Indian soldiers. Two cavalry stables. Water pumped by steam power from 6 driven wells to tank and distributed by iron pipes. Surface drainage.

Yellowstone, Fort, Wyo.—Latitude, 44° 58′; longitude, 102° 39′. On Beaver Creek, 8 miles from Cinnebar, on Yellowstone Park line of Northern Pacific Railroad. During winter trains run on this branch line Tuesdays, Thursdays, and Fridays. Post-office and telegraph station, Mammoth Hot Springs. Old reservation, 25 square miles; new, 22.5 acres, set aside by the Secretary of the Interior for use of military authorities. Additional tract of about 5.5 acres set aside for hospital site, by Secretary of the Interior, May 11, 1893. Exclusive jurisdiction reserved by act of Congress of July 10, 1890, admitting Wyoming, and by State act of February 17, 1893. Present garrison, 2 troops cavalry. Accommodations for 2 officers and 60 men at old post; 1 barrack. Four officer's quarters, 2 single sets noncommissioned officers' quarters, 1 cavalry barrack, and 1 cavalry stable at new post. Water supply from Clematis Springs. Partial sewer system.

Yerba Buena Island, Cal.—Latitude, 37° 49′; longitude, 122° 27′. Two and one-half miles northeast of San Francisco, Cal. Reservation, the whole island, about 120 acres. Cession of jurisdiction by State act of March 31, 1891. General Order 59, of 1892, transfers reservation to the Engineer Department, for use and occupation as a torpedo station for the Pacific coast.

Yosemite National Park, Camp in, Cal.—Post-office and telegraph station, Wawona, Cal.; railroad station, Raymond, via Barenda station, on Southern Pacific Railroad, distance 40 miles; triweekly stage to camp. Present garrison, 1 troop of cavalry, in camp.

REPORT OF THE COMMISSARY-GENERAL OF SUBSISTENCE.

REPORT

OF THE

COMMISSARY-GENERAL OF SUBSISTENCE.

WAR DEPARTMENT,
OFFICE COMMISSARY-GENERAL OF SUBSISTENCE,
Washington, D. C., September 14, 1893.

SIR: I have the honor to submit the following report of the operations of the Subsistence Department for the fiscal year ending June 30, 1893:

RESOURCES AND EXPENDITURES.

The following statement exhibits the aggregate fiscal resources and expenditures of the department for the year mentioned, and the balances at the close of the fiscal year:

RESOURCES.

Amounts in the Treasury to the credit of the appropriations of the Subsistence Department on June 30, 1892, as follows:		
Subsistence of the Army, 1891	$209,069.27	
Subsistence of the Army, 1892	50,589.88	
Relief of sufferers from overflow of Mississippi River and its tributaries, joint resolution, April 25, 1890	451.98	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, acts March 2, 1889, and April 4, 1890	1,294.76	
		$261,405.89
Amounts to credit of officers of the Subsistence Department and of officers doing duty in the Subsistence Department, with the Treasurer, assistant treasurers, and designated depositaries, and in their personal possession on June 30, 1892, as follows:		
Subsistence of the Army, 1892	167,591.56	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, 1891, act August 30, 1890	2,046.27	
Certified claims, 1892, act March 3, 1891	1,506.37	
		171,144.20
Amounts refunded to the Treasury near close of fiscal year 1892, since carried to the credit of the appropriations, as follows:		
Subsistence of the Army, 1891	2,009.81	
Subsistence of the Army, 1892	127.81	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, act March 2, 1889, and April 4, 1890	794.17	
Certified claims, 1890, act April 4, 1890	1,332.08	
		4,263.87

Amounts appropriated for the Subsistence Department for the fiscal year ending June 30, 1893, as follows:		
Subsistence of the Army, 1893, act of July 16, 1892	$1,700,000.00	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, 1893, act of August 5, 1892	30,000.00	
Subsistence of the Army (certified claims), act of July 28, 1892	410.30	
Subsistence of the Army (certified claims), act of March 3, 1893	26.25	
		$1,730,436.55
Amounts collected from various sources and refunded to the appropriations of the Subsistence Department on the books of the Treasury during the fiscal year 1893, as follows:		
Subsistence of the Army, 1890, and prior years	1,005.10	
Subsistence of the Army, 1890, and prior years, transfer account	3,177.79	
Subsistence of the Army, 1891, transfer account	6.35	
Subsistence of the Army, 1891	540.08	
Subsistence of the Army, 1892	2,896.37	
Subsistence of the Army, 1893	4,011.14	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, act of March 3, 1891	69.25	
		11,706.08
Amounts received by officers of the Subsistence Department, and by officers doing duty in the Subsistence Department, from sales of subsistence stores to the following purchasers during the fiscal year 1893, and taken up for immediate disbursement under the following appropriations:		
Subsistence of the Army, 1892: Sales to enlisted men, $2,434.74; sales of property, $6.50; total	2,441.24	
Subsistence of the Army, 1893: Sales to officers, $312,438.82; to enlisted men, companies, detachments, and hospitals, $434,997.38; to post exchanges, $41,416.28; to civil employés, $13,569.71; to Leavenworth military prison, $6,423.61; to Quartermaster's Department, $1,416.84; to Indian agents and employés, $1,573.99; various small sales, $333.65; of surplus and condemned stores and property at auction, $1,251.96; of boxes, barrels, etc., $43.03; of garden seeds, $70.20; total	813,535.47	
		815,976.71
Amounts taken up by officers doing duty in the Subsistence Department on account of reclamations for stores lost, damaged, etc., and in correction of errors in their accounts, etc., during the fiscal year 1893:		
Subsistence of the Army, 1892	117.24	
Subsistence of the army, 1893	738.20	
		855.44
Amounts charged against officers still in service on account of funds and stores alleged to have been lost by theft, etc., for which relief can only be obtained in the Court of Claims under sections 1059 and 1062, Revised Statutes, or from Congress, as follows:		
Subsistence of the Army, 1880	75.92	
Subsistence of the Army, 1886	2,455.82	
Subsistence of the Army, 1889	82.37	
Subsistence of the Army, 1891	41.16	
		2,655.27
Total resources		$2,998,444.01

EXPENDITURES.

Amounts expended on the books of the Treasury from the appropriations of the Subsistence Department during the fiscal year 1893, as follows:		
Subsistence of the Army, 1890, and prior years, transfer account	$39.00	
Subsistence of the Army, 1891	909.52	
Subsistence of the Army, 1892	1,000.49	
Subsistence of the Army, 1893	177.57	
Subsistence of the Army (certified claims), act July 28, 1892	410.30	
Subsistence of the Army (certified claims), act March 3, 1893	26.25	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, acts of March 2, 1889, and April 4, 1890	42.85	
Certified claims, 1890, act April 4, 1890	3.50	
Certified claims, 1893, act August 5, 1892	20.25	
		$2,629.73
Amount disbursed by officers of the Subsistence Department and officers doing duty in the Subsistence Department during the fiscal year 1893, as follows:		
Subsistence of the Army, 1892	82,704.71	
Subsistence of the Army, 1893	2,423,522.10	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, 1891, act August 30, 1890	168.75	
Certified claims, 1892, act March 3, 1891	1,356.75	
Certified claims, 1893, act August 5, 1892	12,829.38	
		2,520,581.69
Amounts dropped by officers doing duty in the Subsistence Department in correction of errors in their accounts during the fiscal year 1892:		
Subsistence of the Army, 1892	2.60	
Subsistence of the Army, 1893	61.82	
		64.42
Amounts transferred on books of Treasury, act March 3, 1875 (18 Stat. L., 418):		
Subsistence of the Army, 1890, and prior years, transfer account	3,138.79	
Subsistence of the Army, 1891, transfer account	6.35	
		3,145.14
Amounts carried to the suplus fund on June 30, 1893:		
Subsistence of the Army, 1890, and prior years	1,005.10	
Subsistence of the Army, 1891	210,709.64	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, 1890, act April 4, 1890	1,328.58	
Certified claims, 1891, act August 30, 1890	1,877.52	
Certified claims, 1892, act March 3, 1891	218.87	
Relief of sufferers from overflow of Mississippi River and its tributaries, joint resolution, April 25, 1890.	451.98	
		215,591.69
Total expenditures		2,742,012.67

BALANCES.

Amounts in the Treasury to the credit of appropriations of the Subsistence Department on June 30, 1893, as follows:		
Subsistence of the Army, 1892	$140,056.30	
Subsistence of the Army, 1893	18.29	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, acts March 2, 1889, and April 4, 1890	2,046.08	
Certified claims, 1893, act August 5, 1892	16,479.75	
		158,600.42

Amounts to credit of officers of the Subsistence Department, and of officers doing duty in the Subsistence Department, with the Treasurer, assistant treasurers, and designated depositaries, and in their personal possession, on June 30, 1893, as follows:		
Subsistence of the Army, 1893	$90,987.83	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough:		
Certified claims, 1893, act August 5, 1892	670.62	
		$91,658.45
Amounts refunded to the Treasury near close of fiscal year 1893, but not carried to the credit of the appropriations by June 30, 1893, as follows:		
Subsistence of the Army, 1893		3,517.20
Amounts charged against officers still in service on account of funds and stores alleged to have been lost by theft, etc., and for which relief can only be obtained in the Court of Claims under sections 1059 and 1062, Revised Statutes, or from Congress, as follows:		
Subsistence of the Army, 1880	75.92	
Subsistence of the Army, 1886	2,455.82	
Subsistence of the Army, 1889	82.37	
Subsistence of the Army, 1891	41.16	
		2,655.27
Total balances		256,431.34

SUPPLIES.

Supplies required to be furnished by the Subsistence Department have been procured as near the places of consumption as practicable, quality, prices, and cost of transportation being considered. The great commercial centers have, as usual, been drawn upon for a large portion of the needed supplies.

ADVERTISEMENTS AND CONTRACTS.

During the fiscal year ending June 30, 1893, 383 newspaper advertisements and 598 circulars and posters inviting proposals for subsistence supplies were reported to this office. There were also reported 3,743 contracts of various kinds for fresh meats, fresh vegetables, complete rations, and other subsistence supplies required for the Army.

ISSUES TO INDIANS.

The following statement shows the value of subsistence stores issued to Indians during the year chargeable to the Indian Bureau of the Interior Department, the amounts reimbursed by that Bureau, and the amounts still due, viz:

To whom issues made.	Value of issues.	Reimbursement by Indian Bureau.	Balance due from Indian Bureau.
Enlisted Indians and their families:			
Troop L, Third Cavalry, Fort Meade, S. Dak	$560.06	$373.39	$186.67
Troop L, Eighth Cavalry, Fort Keogh, Mont	2,850.10	1,744.65	1,105.45
Families of enlisted Indians:			
Troop L, Third Cavalry, Fort Meade, S. Dak	372.27	372.27	.....
Company I Second Infantry, Fort Omaha, Nebr	592.83	559.36	33.47
Company I, Sixteenth Infantry, Fort Douglas, Utah	360.76	360.76	.....
Company I, Twenty-first Infantry, Fort Sidney, Nebr	97.43	97.43	.....
Destitute Pi-Ute Indians at Fort Bidwell, Cal	32.58	32.58	.....

The two sums of $186.67 and $1,105.45, above reported as due from the Indian Bureau, have been disallowed by the accounting officers as a charge against that Bureau. These charges were for the value of rations due the Indians under treaty stipulations, which were issued to them in addition to the rations to which they were entitled as soldiers.

The following issues were made to Indians for which no charge was made against the Indian Bureau, viz:

To whom issues made.	Value of issues.
Chiricahua Indian prisoners at Mount Vernon Barracks, Ala.	$14,512.90
White Mountain Apaches, Fort Apache, Ariz.	34.68
Indian prisoners at various posts	164.23
Indians visiting military posts under Army Regulations 1395 and 1396	535.59
	15,247.40

MISCELLANEOUS ISSUES AND EXPENDITURES.

Issues to the value of $80.65 were made to teachers of Indians at Mount Vernon Barracks, Ala., which amount has been transferred to the appropriation for this Department from the appropriation Contingencies of the Army.

Destitute citizens have been supplied with subsistence at several posts during the year, upon orders of the commanding officers. These issues have amounted to 1,063 incomplete rations.

Issues to Mexican prisoners at Forts Ringgold and McIntosh, and at camp at Rendado, Tex., were made to the extent of 295 rations.

For liquid coffee there was expended $6,374.54, being a decrease of $363.13 from the expenditure of previous year for same purpose; for extra duty service, $22,081.05, an increase of $594.45; for advertising, $9,875.54, an increase of $1,010.95; for cooked rations, $94,101.72, an increase of $15,980.27; for construction of new and the repair of old ovens at various posts, $6,637.29, a decrease of $229.95.

LOSSES OF STORES AND PROPERTY.

The value of stores reported lost by accident, by wastage in transportation, while in store, etc., during the year, for which no one has been held accountable, was $6,113.05.

Supplies lost in transportation during the year, for which responsibility was fixed, amounted to $863.48, of which $645.15 has been collected.

SALE OF CONDEMNED AND SURPLUS SUPPLIES.

	Subsistence stores.		
	Condemned.	Surplus.	Total.
Original cost	$10,129.43	$196.65	$10,326.08
Amounts realized from sales	1,091.55	83.60	1,175.15
Loss	9,037.88	113.05	9,150.93

Of subsistence property the amount realized from such as was condemned was $76.81.

SALES ON CREDIT TO ENLISTED MEN.

Sales of subsistence stores to enlisted men on credit, under Army Regulation 1413, during the year amounted to $26,617.88, and the collections on account thereof to $23,765.07.

COMMISSARY SERGEANTS.

The number of commissary sergeants in service at the commencement of the fiscal year was 109. During the year 6 new appointments were made, 2 died, 1 was discharged, and 6 were retired. The number in service at the close of the year was 106.

ACCOUNTS AND RETURNS DIVISION.

	Accounts current.	Returns of subsistence stores.	Returns of subsistence property.	Total.
On hand June 30, 1892	314	249	40	603
Received during the fiscal year	2,320	1,540	748	4,608
Total	2,634	1,789	788	5,211
Examined during the year	2,267	1,518	750	4,535
On hand June 30, 1893	367	271	38	676

The examination of the accounts current involved the verification of 40,275 vouchers; the returns of subsistence stores, 29,844 vouchers, and the returns of subsistence property, 1,585 vouchers. There were 5,3[illegible] letters and 2,077 indorsements written in connection with the examinations. The accounts and returns were rendered by 476 officers.

CLAIMS DIVISION.

	Claims for commutation of rations while prisoner of war.	Claims for commutation of rations while on furlough; and miscellaneous claims.	Total.
On hand June 30, 1892	94	111	205
Received during the fiscal year	475	728	1,203
Total	569	839	1,408
Disposed of during the year	531	790	1,321
On hand June 30, 1893	38	49	87

In addition to the foregoing, 19 old disallowed claims of the above character were reopened and disposed of. The number of communications sent out from the division during the year was 6,060.

DUTIES AND STATIONS OF OFFICERS OF THE SUBSISTENCE DEPARTMENT.

A roster of the officers of the Subsistence Department on June 30, 1893, showing their stations and duties on that date, is hereto appended.

Very respectfully, your obedient servant,

JOHN P. HAWKINS,
Commissary-General of Subsistence.

The SECRETARY OF WAR.

Roster of the Subsistence Department, U. S. Army, June 30, 1893.

Name and rank in the Department.	Rank by brevet.	Duty and station.
COMMISSARY-GENERAL OF SUBSISTENCE.		
Brigadier-General.		
John P. Hawkins	Brevet major-general, Mar. 13, 1865.	Commissary-General of Subsistence, Washington, D. C.
ASSISTANT COMMISSARIES-GENERAL OF SUBSISTENCE.		
Colonels.		
Michael R. Morgan	Brevet brigadier-general, Apr. 9, 1865.	Assistant to the Commissary-General of Subsistence, Washington, D. C.
Thomas C. Sullivan		Purchasing C. S. at Chicago, Ill.
Lieutenant-colonels.		
John W. Barriger	Brevet brigadier-general, Mar. 13, 1865.	Chief C. S., Department of the East, New York, N. Y.
Thomas Wilson	Brevet brigadier-general, Mar 13, 1865.	Purchasing C. S. at New York City, N. Y.
William H. Bell		Purchasing C. S. at Denver, Colo.
COMMISSARIES OF SUBSISTENCE.		
Majors.		
Jeremiah H. Gilman	Brevet lieutenant-colonel, Dec. 31, 1862.	Chief C. S., Department of the Missouri, Chicago, Ill.
Samuel T. Cushing		Under orders as chief C. S., Department of the Platte, and purchasing C. S., at Omaha, Nebr.
William A. Elderkin		Chief C. S., Department of Arizona, Los Angeles, Cal.
Charles B. Penrose	Brevet lieutenant-colonel, Nov. 11, 1867.	Purchasing C. S. at Baltimore, Md.
William H. Nash		Chief C. S., Department of the Columbia, Vancouver Barracks, State of Washington, and purchasing C. S. at Portland, Oregon.
Charles P. Egan		Chief C. S., Department of California, San Francisco, Cal.
John F. Weston		Under orders as chief C. S., Department of Texas, and purchasing C. S. at San Antonio, Tex.
Charles A. Woodruff		Purchasing C. S. at San Francisco, Cal.
Captains.		
John J. Clague		Chief C. S., Department of Dakota, and purchasing C. S. at St. Paul, Minn.
Wells Willard		Chief C. S., Department of Texas, and purchasing C. S. at San Antonio, Tex. On leave.
Henry G. Sharpe		Purchasing C. S. at St. Louis, Mo.
Frank E. Nye		Purchasing C. S. at Washington, D. C.
Douglas M. Scott		Purchasing C. S. at Boston, Mass.
William L. Alexander		Post C. S., Fort Monroe, Va.
Henry B. Osgood		Chief C. S., Deparment of the Platte, and purchasing C. S. at Omaha, Nebr.
Oskaloosa M. Smith		Purchasing C. S. at New Orleans, La.
Edward E. Dravo		Temporary duty in office Commissary-General of Subsistence, Washington, D. C.
Abiel L. Smith		Purchasing C. S. at Kansas City, Mo.
Tasker H. Bliss		On detached duty as aide-de-camp to the Major-General commanding the Army, Washington, D. C.
James N. Allison		Assistant to purchasing C. S., New York, N. Y.

REPORT OF THE SURGEON-GENERAL OF THE ARMY.

REPORT

OF

THE SURGEON-GENERAL.

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE,
Washington, D. C., September 4, 1893.

SIR: I have the honor to submit herewith a statement of disbursements made during the fiscal year ending June 30, 1893, from the appropriation made by act of Congress approved July 16, 1892, for the expenses of the Medical Department of the Army, and the balance on hand at the close of said fiscal year, viz:

Medical and Hospital Department, 1893:		
Appropriated by act approved July 16, 1892		$170,000.00
Refunded during the year		219.17
Total to be accounted for		170,219.17
Disbursed during the year:		
Medical and hospital supplies	$56,424.89	
Pay of employés	42,072.39	
Expenses of medical supply depots	158.42	
Medical attendance and medicines	3,180.02	
Washing at post hospitals	1,949.64	
Miscellaneous expenses	753.44	
		104,538.80
Balance on hand June 30, 1893		65,680.37

The whole of this balance remaining on hand at the close of the fiscal year has already been or will be expended in payment for supplies contracted for, and for other obligations incurred prior to July 1, 1893.

In addition to the above-stated sum of $3,180.02, expended for medical attendance and medicines, vouchers amounting in all to $13,357.38 have also been approved at this office up to July 26, 1893, for medical attendance rendered at posts where there were no medical officers of the Army, and forwarded to the Paymaster-General of the Army for payment from the appropriation made by act approved July 16, 1892, viz: "For pay for medical services at posts where there are no medical officers, $15,000." This amount is, under the provisions of the above-cited act, to be disbursed and accounted for by the Pay Department of the Army. The total expenditures of the Medical Department for medical attendance and medicines furnished to officers and enlisted men of the Army during the fiscal year ending June 30, 1893, in cases where the services of a medical officer of the Army could not be obtained, therefore, amounted to $16,537.40. It is estimated that other accounts for similar services rendered during the fiscal year, amounting to $1,500, will hereafter be presented to this office for payment.

The approximate value of the medical and hospital supplies actually issued during the fiscal year ended June 30, 1893, was $124,000.

I have the honor to submit also a statement showing the expenditures during the last fiscal year from the appropriations for the Medical Department for prior fiscal years and the balance on hand June 30, 1893, viz:

Medical and Hospital Department, 1892:		
Balance on hand July 1, 1892		$77,183.54
Appropriated by act approved March 3, 1893		1,800.00
Refunded during the year		109.38
Total to be accounted for		79,092.92
Disbursed during the year:		
Medical and hospital supplies	$69,820.85	
Pay of employés	200.00	
Expenses of medical supply depots	1.66	
Medical attendance and medicines	2,198.29	
Miscellaneous expenses	188.57	
		72,409.37
Balance on hand June 30, 1893		6,683.55
Medical and Hospital Department, 1891:		
Balance on hand July 1, 1892		38,722.91
Disbursed during the year:		
Medical and hospital supplies	$6,703.00	
Medical attendance and medicines	152.83	
		6,855.83
Carried to surplus fund		31,867.08
Medical and Hospital Department—certified claims, 1893:		
Appropriated by act approved—		
July 28, 1892 (warrant No. 6)		31.35
March 3, 1893 (warrant No. 16)		114.00
Total to be accounted for		145.35
Disbursed during the year		145.35

Since the last annual report the new Standard Supply Table of the Medical Department has been issued, and many copies have been distributed by request to officers of the National Guard. Medical officers of these organizations have taken much interest in the new field equipment of this department, and it is understood that in several States portions of this equipment, especially the field case and orderly and hospital corps pouches, have been or soon will be adopted.

The ice machines at posts on the southern border give satisfactory results and are of much benefit to the sick as well as to the garrisons; all are now self-supporting.

Library of the Surgeon-General's office, 1892:		
Balance from previous fiscal year		$2,274.24
Disbursed during the year		2,274.24
Library of the Surgeon-General's office, 1893:		
Appropriated by act of July 16, 1892		7,000.00
Disbursed during the year		6,986.79
Balance June 30, 1893		13.21
Army Medical Museum, 1891:		
Balance from previous fiscal year		4.15
Disbursed during the year	$3.50	
Carried to the surplus fund	.65	
		4.15

Army Medical Museum, 1892:		
Balance from previous fiscal year		$1,050.14
Disbursed during the year		1,050.14
Army Medical Museum, 1893:		
Appropriated by act of July 16, 1892		5,000.00
Disbursed during the year		3,600.97
Balance June 30, 1893		1,399.03
Army and Navy General Hospital for improvement and maintenance of grounds.		
Appropriated by act of August 5, 1892		7,960.60
Disbursed during the year		3,921.11
Balance on hand June 30, 1893		4,039.49
Artificial limbs, 1890:		
Balance from previous fiscal year		818.80
From transfer account		37.38
Total to be accounted for		856.18
Disbursed during the year	$37.38	
Carried to the surplus fund	818.80	
		856.18
Artificial limbs, 1891:		
Balance from previous fiscal year		3,343.73
Disbursed during the fiscal year	$2,187.72	
Carried to the surplus fund	660.92	
		2,848.64
Balance June 30, 1893		495.09
Artificial limbs, 1892:		
Balance from previous fiscal year		81,177.39
Disbursed during the year		54,404.19
Balance June 30, 1893		26,773.20
Artificial limbs, 1893:		
Appropriated by act of August 5, 1892		175,000.00
Disbursed during the year		135,761.53
Balance June 30, 1893		39,238.47
Appliances for disabled soldiers, 1891:		
Balance from previous fiscal year		58.61
Carried to the surplus fund		58.61
Appliances for disabled soldiers, 1892:		
Balance from previous fiscal year		95.90
Disbursed during the year		67.50
Balance June 30, 1893		28.40
Appliances for disabled soldiers, 1893:		
Appropriated by act of August 5, 1892		2,000.00
Disbursed during the year		1,754.83
Balance June 30, 1893		245.17
Expended in furnishing trusses to disabled soldiers under the Revised Statutes, sections 1176 to 1178, and act of March 3, 1879		10,926.78
Support and medical treatment of destitute patients in the city of Washington:		
Appropriated by act of August 5, 1892		19,000.00
Disbursed during the year		19,000.00

There were furnished to disabled soldiers, seamen and marines during the year ending June 30, 1893:

Trusses	1,494
Special appliances	230
Artificial legs furnished in kind	15
Artificial arm furnished in kind	1
Artificial hand furnished in kind	1
Apparatus for arm furnished in kind	1
Limbs and apparatus commuted	2,688

ARMY MEDICAL MUSEUM.

The total number of specimens received during the fiscal year was 1,038; total number of specimens in the Museum June 30, 1893, 32,265. The following statement shows the details of additions, transfers, etc., in the different sections:

Pathological Section:		
In Museum June 30, 1892		10,305
Exchanged during the year		1
		10,304
Transferred from Provisional Pathological Section during the year		1
Received during the year		208
In Museum June 30, 1893		10,513
Anatomical Section:		
In Museum June 30, 1892		3,411
Received during the year		41
In Museum June 30, 1893		3,452
Section of Comparative Anatomy:		
In Museum June 30, 1892		1,717
Received during the year		0
In Museum June 30, 1893		1,717
Microscopical Section:		
In Museum June 30, 1892		12,270
Received during the year		500
In Museum June 30, 1893		12,770
Miscellaneous Section:		
In Museum June 30, 1892		1,524
Received during the year		116
In Museum June 30, 1893		1,640
Provisional Pathological Section:		
In Museum June 30, 1892		1,274
Transferred to Pathological Section during the year		1
		1,273
Received during the year		140
In Museum June 30, 1893		1,413
Provisional Anatomical Section:		
In Museum June 30, 1892		727
Received during the year		33
In Museum June 30, 1893		760

RECAPITULATION.

Total number of specimens in Museum June 30, 1892	31,228
Exchanged during the year	1
	31,227
Total number received during the year	1,038
Total number in Museum June 30, 1893	32,265

The following are some of the more interesting specimens added to the Museum collection during the fiscal year ending June 30, 1893:

(1) A series of embryos, human and comparative, normal and monstrous. Presented by Dr. F. H. Day, Wauwatosa, Wis.
(2) Monstrous human fœtus, a peromelus, with several accessory spleens, several cysts in the mesentery and the kidneys hypertrophied nearly to adult size. Presented by Dr. T. A. R. Keech, Washington, D. C.
(3) An extra-uterine fœtation at two months. Death from rupture and hemorrhage. Presented by Dr. T. C. Smith, Washington, D. C.
(4) An extra-uterine fœtation at about fourteen days. Death from rupture and hemorrhage. Presented by Dr. D. S. Lamb, Washington, D. C.
(5) Extra-uterine fœtation at five months, removed by laparotomy. Recovery. Presented by Dr. I. S. Stone, Washington, D. C.
(6) Extra-uterine fœtation at term, removed by laparotomy. Recovery. Presented by Dr. J. Tabor Johnson, Washington, D. C.
(7) A series of parasites of the horse, pig, ox, and sheep. Received in exchange from Dr. C. W. Stiles, Bureau of Animal Industry, U. S. Department of Agriculture.
(8) Sternum, showing eight cartilages on left side. From a white woman, aged 30, who was left-handed. Presented by Dr. D. S. Lamb, of Washington, D. C.
(9) Heart showing punctured wound, followed by abscess of interventricular septum which ruptured into the left ventricle. Presented by Assistant Surgeon A. B. Heyl, U. S. Army.
(10) Specimen of chronic pericarditis with chalky plates. Presented by Lieut. Col. W. H. Forwood, Deputy Surgeon-General, U. S. Army.
(11) Portions of brain from a case of an abscess of brain following a fall. On the supervention of convulsions with paralysis trephining was performed and the abscess emptied. The patient recovered (Medical News, Philadelphia, 1887, Vol. LI, p. 675). Presented by Dr. L. D. Wilson, Wheeling, W. Va.
(12) Three specimens showing cancer of brain and dura mater. Presented by Dr. W. P. Carr, Washington, D. C.
(13) Specimen showing congenital absence of vermiform appendix. From a soldier. Presented by Lieut. Col. W. H. Forwood, Deputy Surgeon-General, U. S. Army.
(14) Liver showing congenital syphilitic cirrhosis. From a white boy, aged 16 years. Presented by Dr. C. G. Stone, Washington, D. C.
(15) Specimen of primary cancer of the gall-bladder. From a mulatto, aged 55 years. Presented by Dr. Thomas Martin, Washington, D. C.
(16) Specimen showing congenital absence of ovaries. From a mulatto woman, aged about 50 years; married, but without children. Presented by Dr. D. S. Lamb, Washington, D. C.
(17) A series of thirteen models showing various diseases of the skin and subcutaneous tissue. Made by J. Baretta, Paris, France. Purchased.
(18) Papier-maché model, six times enlarged, of the bones of the base of the skull and the face. Made by J. H. Emerton, Boston. Purchased.
(19) Model of the eye, orbit, and adjacent parts. Made by Dr. August Müller, Berlin. Purchased.
(20) A series of skeletons and crania of natives of New Britain and the Samoan Islands. Purchased.
(21) Transport or pack saddle used by the medical department of the British army in India. Presented by Dr. Robert Harvey, principal medical officer, Punjab frontier force, Peshawar, India.

The Museum is represented at the World's Columbian Exposition at Chicago by a display of specimens, including models of hospitals, of a railway train for transportation of wounded, and of hospital steamers; also a series of pathological specimens illustrating tuberculosis and tumors, a series of ninety sections of human embryos, a series of three hundred and forty-six photomicrographs, and a series of microscopes, illustrating the history of the instrument, with other apparatus.

The Army Medical Museum has been visited during the fiscal year ending June 30, 1893, by 85,000 persons.

LIBRARY OF THE SURGEON-GENERAL'S OFFICE.

The following table shows the additions made to the library during the fiscal year.

Description.	On hand June 30, 1892.	Added during fiscal year.	Total June 30, 1893.
Medical journals	31,212	1,003	32,215
Medical transactions	4,504	195	4,699
Bound theses	1,663		1,663
Bound pamphlets	2,073	185	2,258
Other medical books	67,748	2,070	69,818
Total	107,200	3,453	110,653
Medical theses	52,119	1,844	53,963
Medical pamphlets	*112,564	6,573	119,137
Total	164,683	8,417	173,100

*Of the total number of single pamphlets on hand June 30, 1892, there were bound during the year 630 in 128 volumes.

There were presented to the library during the year 633 books and 7,981 pamphlets and journals.

Volume XIV of the Index Catalogue, including from "Sutures" to "Universally," forming a volume of 1,016 pages, has been completed and is now in the printer's hands. The edition will be distributed as soon as bound to those institutions and persons who have received the previous volumes. The preparation of the manuscript of volume XV is already well advanced.

PROVIDENCE HOSPITAL.

Under the provisions of the act of August 5, 1892, making appropriation of $19,000 "for the support and medical treatment of ninety-five medical and surgical patients who are destitute in the city of Washington, under a contract to be made with the Providence Hospital by the Surgeon-General of the Army," a contract was duly entered into with the institution named, and has been fulfilled to my satisfaction and without complaint on the part of the persons sent there for treatment. The following is a statement of the amount of relief afforded under the appropriation:

Number of patients in hospital July 1, 1892	95
Number of patients admitted during the year	933
Total number of patients treated	1,028
Average number of patients admitted per month	78
Number remaining in hospital June 30, 1893	94
Total number of days' treatment afforded	37,904
Average number of days' treatment per patient	37
Average number of patients treated per day	104
Longest term of treatment (days)	365
Shortest term of treatment (days)	1
Number of patients in hospital during the whole year	36

The patients included in the statement represent all classes of diseases, acute and chronic, except those of a contagious nature. The patients shown as having remained in hospital during the whole year are incurable, without home or friends.

ARMY AND NAVY GENERAL HOSPITAL.

The capacity of the hospital is 16 beds for officers and 64 for enlisted men; total 80. The officers' division is closed in July, August and September, but during the autumn, winter and early spring there is difficulty in accommodating the applicants. This may be overcome in part by a regulation recently issued by the War Department limiting the authority to enter to two weeks; that is, the permission is void after two weeks' delay. Thirty officers were treated during the last fiscal year, of whom 19 were Army officers on the active list; of these 1 was transferred to the Government Hospital for the Insane, 4 have been recommended by boards for retirement, and the remainder are believed to be on duty in varying degrees of health. There were three Navy officers, none of whom recovered their health. One officer of the Revenue Marine became quite well. The other officers were on the retired list of the Army and Navy.

Of the enlisted men there were taken into the hospital from other posts 75 soldiers, and 15 were present on the beginning of the year. Of these 90 cases, 69 were terminated, 3 by death, 19 by discharge for disability, 2 by discharge by purchase, 4 were transferred to their stations not improved, 1 deserted, and 40, or 58 per cent, were returned to duty. Of 40 completed cases of articular and muscular rheumatism 25, or more than 60 per cent, were returned to duty. Of those discharged for disability, the ability of more than 68 per cent to support themselves by manual labor was estimated at one-half or more. The subsequent histories of 41 cases returned to duty in the calendar year 1892 show that six months after they left the hospital 32, or 78 per cent, were doing duty.

The admission of men to the general hospital was much simplified by a general order issued in September, 1892, apportioning the beds for enlisted men among the military departments, and authorizing department commanders to send men directly to the hospital; and it was hoped that more soldiers would be enabled to take advantage of it. This, however, has not been the case; the number of admissions has not materially altered. Three times as many cases could be treated in the course of the year as are received. The average residence in hospital of the men returned to duty was 105 days and of those discharged for disability 104 days.

Besides the usual allowance of $600 for the minor repairs of the hospital there was an allowance of $972.77 for repairs to the bath house, which has been replastered and repainted within. There was also a special appropriation for the improvement of the grounds of $7,960.60. This is being expended in walls, fences, roads, drainage, a flagstaff, and other permanent improvements outside of the hospital buildings.

The commanding officer recommends that electric light be introduced in place of gas, and that increased accommodations be provided for officers, in both of which recommendations I fully concur.

MEDICAL OFFICERS.

The requirements of the Army, as regards medical officers during the past year, have been as follows:

Number of permanent posts and stations	91
Number of temporary posts and substations	11
Total	102

There were 76 medical officers reported to this office as having been on duty with scouting parties and other field service during the year.

Army medical examining boards were convened in New York City, N. Y., October 3, 1892, and March 27, 1893, and remained in session one month each, for the examination of candidates.

The following is a recapitulation of the work performed by the boards during their sessions:

Candidates invited to appear for examination	54
Candidates found qualified	12
Candidates rejected, professionally	20
Candidates rejected for physical disability	7
Candidates who withdrew after partial examination	4
Total examined	43
Candidates who failed to appear for examination	11

Deaths.—One deputy surgeon-general, with the rank of lieutenant-colonel; 1 surgeon, with the rank of major.

Retirements.—One surgeon-general, with the rank of brigadier-general; 1 assistant surgeon general, with the rank of colonel; 1 assistant surgeon, with the rank of captain (Capt. James A. Finley, act of February 8, 1893).

Promotions.—One deputy surgeon-general, with the rank of lieutenant-colonel, to be assistant surgeon-general, with the rank of colonel; 3 surgeons, with the rank of major, to be deputy surgeons-general with the rank of lieutenant-colonel; 2 assistant surgeons, with the rank of captain, to be surgeons with the rank of major; 4 assistant surgeons, with the rank of first lieutenant, to be assistant surgeons with the rank of captain.

Appointments.—One deputy surgeon-general, with the rank of lieutenant-colonel, to be surgeon-general with the rank of brigadier-general; James A. Finley, late captain and assistant surgeon, to be assistant surgeon with the rank of captain, February 13, 1893, with rank from November 10, 1879 (act of February 9, 1893); twelve assistant surgeons, with the rank of first lieutenant.

Resigned.—One assistant surgeon with the rank of captain; 1 assistant surgeon with the rank of first lieutenant.

Commission vacated by new appointment.—One deputy surgeon-general with the rank of lieutenant-colonel.

Vacancies.—There are now 5 vacancies in the Medical Department.

The establishment of an Army Medical School in the city of Washington, D. C., was authorized by General Orders No. 51, Adjutant-General's Office, June 24, 1893, for the purpose of instructing approved candidates for admission to the Medical Corps of the Army in their duties as medical officers. The course of instruction at this school will extend over four months and will be given annually beginning on the first day of November. The faculty will consist of a president, who will be responsible for the discipline of the school and will deliver a course of lectures on the duties of medical officers in war and peace; a professor of military surgery, including the care and transportation of wounded; a professor of military hygiene, including practical instruction in the examination of water, air, food, and clothing from the sanitary point of view, and a professor of clinical and sanitary microscopy, including bacteriology and urinology. The professors will be selected from among the senior medical officers of the Army stationed in or near the city of Washington. In like manner will be selected as many asso-

ciate professors as may be required to give practical laboratory instruction in the methods of sanitary analysis, microscopical technique, clinical microscopy, bacteriology, etc.

The next Army Medical Examining Board will be convened in Washington, D. C., and as its membership will include members of the faculty of the Army Medical School, the qualifications of approved candidates will be known satisfactorily to those who will be required to undertake their further instruction. Although there is no need to teach medicine or surgery to well-educated graduates of our medical colleges there are certain duties pertaining to the position of an army medical officer for which the college course of these young men has not prepared them; and certain of these duties are more important than the clinical treatment of individual cases of disease and injury because the efficiency of a command, of an army even, may depend upon their proper performance. During the past twenty years the prevention of disease has made infinitely greater progress than its cure. Recognizing this fact health officers have been appointed and health boards organized by civil communities for their own protection. A special education is needful to prepare a medical man to undertake the responsibility of protecting the public health. The army medical officer is the health officer of his command; but the young graduate seldom is equipped with the knowledge or experience necessary to efficient action in this position. The course at the Army Medical School will prepare him to cope with the questions of practical sanitation that will be presented to him at every turn in his military career; questions of site and soils and buildings; of ventilation, heating, and occupancy; of drainage, sewerage, and disposal of garbage; of the wholesomeness of water supplies, and of the various articles of food in the contractor's herd, the slaughter-house, the subsistence storerooms, the kitchen or mess hall; of the practical value of disinfectants, the bacteria which they destroy and the ptomaines which these elaborate—all bearing upon the preservation of the health of the military community under his sanitary care.

The stationing of one of the companies of instruction of the Hospital Corps at Washington Barracks, recently authorized, will be of value in connection with the work of the Medical School. (See page 17.)

HOSPITAL CORPS.

The authority of the Secretary of War, given in General Orders No. 25, 1892, to enlist from civil life into the Hospital Corps, and the act approved July 13, 1892, raising the pay of hospital-corps privates from $13 to $18 per month, have greatly benefited the Corps by enlarging the sphere of selection and offering better inducements to good men to enter its ranks.

There were in service June 30, 1893, 122 hospital stewards, 79 acting hospital stewards, and 585 privates, 58 of the last serving with the companies of instruction, and 527 on duty with troops and at military stations.

Taking into consideration the number of garrisoned posts, the requirements of camps more or less permanent, field service, and independent commands, the force of the Hospital Corps under Army Regulations would be: Hospital stewards, 146; acting hospital stewards, 87, and privates, 592. The estimate submitted for the year ending June 30, 1894, for the support of the Corps was $225,000; but the sum of $215,000 only was appropriated. It is expected, however, that with proper restrictions as to the wants of the service and the enforcement

of due economy in the administration of the military hospitals, the appropriation will not be exceeded.

The loss of membership for the year was 257. Twelve of these were due to retirements; 16 were occasioned by desertion. The percentage of desertion, 2.1, is less than one-half of that in the Army as a whole. The gain for the year was 232.

Fifteen acting hospital stewards were promoted to stewardships during the year, after having served one year as acting stewards and passed a satisfactory examination in accordance with the requirements of section 4 of the act of March 1, 1887, organizing the corps. Of 42 men who came up for examination for the position of acting hospital steward 30 passed and 12 failed.

At the present time it is needless to advance arguments in favor of an organization which is recognized as essential in all modern armies, nor is it necessary to contend that such an organization must in all particulars be a military one. It would seem therefore that no more important duty now attaches to the Medical Department of the Army than the proper training of the men of the Hospital Corps and the perfecting of its organization. The company of instruction having passed the experimental stage a bill was introduced into Congress at its last session looking to a legalizing of such organizations and the placing of them on a definite basis. This bill passed the House of Representatives without question, but while in the Senate committee was attacked from the outside on the ground that it contained the possibility of command by medical officers over other troops than the men of the Hospital Corps, and was amended by the introduction of a clause covering this point. As amended the bill passed the Senate, but it did not reach the House until the closing hours of the session, when in the press of business no opportunity was obtained of bringing it up for action.

A comparison of the men trained in the companies of instruction with the members of a detachment locally selected and instructed is occasionally to the disadvantage of the former, as might be expected from differences in the ability and capacity of individuals; but the general testimony is to the superiority of the school-instructed men over the ordinary hospital-corps private, and no one who has seen the work of the companies as units can question the certain superiority of bodies of men so trained over any organization locally gathered and individually instructed. The following report from Maj. V. Havard shows the character of the instruction given to the companies:

The course of instruction comprises infantry drill through the school of the company (including the manual of arms). Special attention is given to the military training of civilians enlisting directly into the hospital corps, and with gratifying results. The experiment of having such men drilled with one of the regimental companies, to which they were assigned for the purpose proved a failure. All their instruction, military as well as technical, should and can be received in the Hospital Corps company.

The theoretical instruction, imparted by recitations, lectures, and demonstrations, embraces the following branches:

Elementary anatomy and physiology; minor surgery; first aid; surgical instruments, bandaging and dressings; rudiments of materia medica and pharmacy; nature and symptoms of ordinary diseases; nursing, including a knowledge of antiseptics and disinfectants; poisoning; cooking.

The practical instruction embraces the following:

1. Bearer drill, covering the whole official manual.

2. First aid, including the application of dressings and bandages, according to the nature and location of injuries as indicated on tags fastened to the dummy wounded.

3. Nursing. Three men are on duty in each of the two hospital wards, designated as wardmaster, nurse, and assistant nurse; the wardmaster is selected for his knowledge, experience, and aptitude to instruct; the nurse and assistant nurse are changed

every two weeks and are not excused from attending recitations and drills; they are specially taught the use of the clinical thermometer, the dressing of wounds, and the care of the sick.

4. Pitching and striking tents; use of the medical saddle in packing and unpacking field chests and miscellaneous articles. As it has been impossible to obtain horses for the use of ambulances and the mounting of noncommissioned officers, the care of horses and driving are not taught systematically. Pack mules for instruction are available from the large pack train at the post.

5. Cooking. Men showing aptitude in that direction are detailed as assistant cooks and retained as such until qualified. The allotment made for the purchase of food material will render possible a course of practical instruction for all the members of the company.

The daily course of instruction, theoretical and practical, is as follows, and has been substantially the same during the past year:

A. M.— 9 to 9:45 military drill.
10 to 11 lecture and recitation.
P. M.— 1:15 to 2 instruments, bandaging, and dressings.
2:15 to 3 bearer drill and field work.
3:15 to 3:45 additional lecture and recitation for the second section.
3:45 to 4:30 special lecture and recitation in pharmacy, etc., for acting stewards and more advanced men (only twice a week).

It would be desirable that the men instructed here could come together at the same time twice a year, forming two classes each year; the scheme of instruction would be simplified and give still better results. Under present and perhaps unavoidable conditions, with men transferred in and out at all times throughout the year, it was found necessary to have a second section in which the new men received additional instruction. On the other hand the more advanced men, those showing special aptitude, and who aspire to become stewards, receive special practical instruction in the dispensary.

The results obtained during the year have been gratifying and seem to justify the trouble and expense incurred. The quality of the men received at the school has sensibly improved and is now very good. Men with objectionable habits or not sufficiently intelligent to learn and discharge the duties of a sanitary soldier still find their way in, and it may be impossible to entirely exclude them. One chronic drunkard was summarily discharged during the year. There has been no desertion from the school.

Concerning transfers from the line into the Hospital Corps, I would respectfully suggest that no recommendation for such transfers be made except in favor of such men as have been tried as company bearers and thus brought under the personal observation of the medical officer making the recommendation.

The men directly enlisted from civil life, especially during the past year, have very generally become good and efficient members of the Hospital Corps, and the wisdom of the regulation permitting such enlistment seems justified.

The companies of instruction are now stationed at Forts Riley and D. A. Russell. The object of establishing them at these posts was apparently to have the men aggregated at central points, so as to minimize transportation in sending them to their stations for duty at the close of their course of instruction. It appeared to me, however, that this would be better accomplished by having one of the companies in the East. A large percentage of our recruits is drawn from eastern cities, and many of the assignments of instructed men are necessarily also to posts on the Atlantic seaboard. As sending men to the West for instruction and bringing them back for duty involved unnecessary expense, it seemed better to have one of the companies stationed in the East, the other remaining in the West for the supply of instructed men to western stations. Of the eastern posts, Washington Barracks, as being centrally situated, appeared to be a suitable location. Moreover, one of the companies, if stationed at the barracks in this city, could be used to advantage in connection with the Army Medical School, affording full opportunity to passed candidates for position in the medical department to become acquainted with the methods of company administration, drill regulations, and other duties in connection with troops. These views, on being presented to the major-general commanding, met with his approval, and authority was given

to organize a company at Washington Barracks and to correspondingly reduce that at Fort D. A. Russell.

To ascertain the views of medical officers on existing methods in the management of the Hospital Corps, reports were called for on the results of competitive examination as affecting promotion to noncommissioned positions, on the value of lectures and drills as bearing on first aid in the field, on the suitability of personal and sanitary equipments, and on the discipline of the corps.

As to selection by competitive examination, orally by a board of examiners at the station of the candidate, and by written questions issued from this office, most of our medical officers agree that the system has had a marked effect in elevating the standard of proficiency, bringing the intelligent, able, and ambitious men to the front, and giving to the corps as its noncommissioned officers its most efficient and capable members. The system, however, does not escape criticism. The most important point raised is, that in proportion as we have gained in intellectual ability we have lost in physique and in military efficiency, or the ability to control men and preserve discipline in a hospital; and there appears to be good ground, in certain instances for this criticism. The remedy for this lies in the hands of the very officers who make the criticism. No man is authorized to appear for examination unless his request has been approved by the medical officer of his post. No medical officer should recommend for promotion a man who is by temperament disqualified from performing one of the most important duties of the hospital steward, that of controlling his men and managing a hospital. This should be a *sine qua non* to appointment.

Two of the reports, both based probably on the same individual instance as both came from posts in the same locality, claim that our present methods admit occasionally "brilliant men of objectionable character," or, as the second report phrases it, "intellectual superiority with deficient moral quality has occasionally outclassed good sterling qualities." In such cases also the fault is dependent not on the method but on the carelessness with which medical officers have certified to the qualifications of intending candidates.

The mass of the testimony is to the effect that as the result of lectures and drills the men of the Hospital Corps have been improved greatly in their ability to render first aid and coöperate with each other in caring for the sick and wounded. This has been demonstrated on various occasions while on active service in the field. The preponderance of opinion is that greater benefit has been derived from drills, which are practical object lessons, than from lectures. Only the men ambitious of promotion have profited by lectures.

The company bearers as a rule have taken but little interest in either the drills or lectures; their attendance has been irregular and the teaching comparatively profitless. It is evident that better results will be attained in the case of the company bearers by restricting their instruction to drills in the management of the litter and wounded man, and in the practical essentials of first aid. It is to be observed, however, that many company and commanding officers look with disfavor upon the instruction given to the company bearers, and much variation is found in the compliance with Army Regulation 1575, the spirit, if not the letter in occasional instances, not being complied with. In fact this regulation is not so definite but that obedience to it may or may not be practiced, according to the construction placed upon it by commanding officers. Some seem to construe the clause "this special

instruction shall not relieve them from the performance of all their regular military duties" as authorizing them to supersede this particular duty by any other whatever, instead of so fixing the hours for other military duties that they should not interfere with the designated hour for instruction. If post commanders would see to it that on the four hours monthly specified by them all of the company bearers, or as many of them as possible, should report to the medical officer for instruction, the result of the instruction would be of much greater value to the command in the event of some future emergency.

From the reports of medical officers on the subject, it appears to be the general opinion that white linen or cotton duck, worn over the fatigue uniform in cold weather and alone in hot climates, is the most suitable wear for men occupied in ward or dispensary duties. I therefore renew the recommendation made in the last annual report of the Surgeon-General that white linen blouses and pantaloons be issued for the use of the Hospital Corps, as these are less absorbent than the regulation articles of clothing. In case of infectious diseases they would show stains more readily and could be immersed in disinfecting solution without injury to their texture.

A satisfactory equipment for the corps is a matter of some difficulty, as its members may be sent on field service at one time with an infantry, at another with a cavalry command. For some time past much difficulty has been experienced in obtaining mounts for these men when ordered to active service in the field, although Army Regulation 1588, as amended by General Order 97, of 1891, prescribes that they shall be mounted, and directs that the Quartermaster's Department shall provide the necessary horses, and the Army appropriation bill, approved July 31, 1892, appropriated money for this purpose. During the past year an application from a post surgeon for mounts for his men elicited the remark from the post quartermaster that all horses in his department were condemned cavalry horses, already advertised to be sold at public auction, and from the chief quartermaster of the department that mules constituted the only mount he was able to furnish. This communication, referred to the Quartermaster-General, brought out the suggestion that when supernumerary horses are available at a post, either in cavalry troops or in the Quartermaster's Department, they should be furnished for the use of members of the hospital corps for duty in the field when called for, and that when no horses are available special application should be made for authority to hire. This was approved by the major-general commanding, and it is expected that hereafter post surgeons will experience no difficulty in having provided for them horses needful to mount their men in accordance with Army Regulations.

RECRUITING.

The number of applicants for enlistment and reënlistment during the year was 25,012; white, 22,692; colored, 2,107; and Indian, 213. Of the white applicants 8,259, or 36.4 per cent, were accepted, 13,662, or 60.2 per cent, were rejected, while 771, or 3.4 per cent, declined enlistment after examination. Of the colored men 807, or 38.3 per cent, were accepted, 1,227, or 58.2 per cent, were rejected, while 73, or 3.5 per cent, declined. Of the Indians 92.5 per cent, were accepted, 7 per cent, rejected, and 0.5 per cent, declined.

In addition to those enumerated above 179 Indians applied for enlistment as scouts, of whom 177 were accepted and 2 rejected.

Causes of rejection.—Of the 25,012 men examined 14,904, or 59.59 per cent, were rejected on the primary examination, the rejection being recorded in one-fifth of this number, or 11 per cent of the total number examined, as due to general unfitness or unclassified causes. Of the classified causes diseases of the eye were most prolific of rejection, having been found to a disabling extent in 8.5 per cent of the applicants. Developmental diseases caused the rejection of 4.4 per cent; diseases of the genito-urinary organs 3.9; minority or under the minimum age 3.8; diseases of the digestive system 3.3; excess of height, weight, or obesity 0.5; under height, weight, or size 5.9; imperfect knowledge of English 2.2; illiteracy only, 0.08; moral character, bad or doubtful, 1.9. Venereal diseases caused relatively more rejections among the colored men; alcoholism more among the whites. The percentage of illiteracy was 0.079 among the white, 0.142 among the colored men. Diseases of the eye were also more disabling among the whites, 8.8 per cent as compared with 6.4. Venereal diseases and diseases of the respiratory organs were the prominent causes among the small number of Indians examined.

Physique of accepted recruits and reënlisted men. Age.—Of 9,585 recruits accepted on primary examination—white 8,555, colored 833, Indian 197—567 men were under 20 years of age, 4,880 from 20 to 24 years, 2,527 from 25 to 29, 790 from 30 to 34, 348 from 35 to 39, 424 from 40 to 49, and 49 over 50 years. The average age of these recruits was 25.39 years.

Height.—The average height of those under 20 years was 67.16 inches; of those from 20 to 24 years, 67.53 inches; of those from 25 to 30 years, 67.41 inches; the average height of those enlisted in each of the years of the last two periods differing from the average of the period by only one-tenth of an inch. Beyond the age of 30 years the average height became somewhat reduced. The average height of the whole number examined was 67.43 inches, the Indian being a little more than an inch taller than the colored man and a little less than an inch taller than the white man.

Weight.—The average weight was found to increase with age from 129.25 pounds among the boys of 16 to 152.94 among reënlisted soldiers over 50 years of age. The average of the whole number was 145.35 pounds, the colored man being 3 pounds heavier than the white and 2 pounds heavier than the Indian.

The size of the chest also increased in proportion to age, from 32.89 inches at expiration among those under 20 years to 35.15 inches among those over 50, and from 35.74 to 37.62, respectively, at full inspiration; but there was little variation in the expansibility from the average of 2.86 inches. The white man had the largest chest, but the Indian, with the smallest measurements, had the greatest expansibility, 3.12 inches.

The average age of the men accepted for service during the year was 25.39 years; height, 67.43 inches; weight, 145.35 pounds; measurement of chest at expiration, 34.16 inches; at inspiration, 37.02 inches; expansibility of chest, 2.86 inches.

Of the white men the average height was 67.42 inches; weight, 145.07 pounds; chest measurements, 34.17 and 37.06 inches.

Of the colored men: Height, 67.26 inches; weight, 148.08 pounds; and chest measurements, 34.12 and 36.70 inches.

Of the Indians: Height, 68.30 inches; weight, 146.04 pounds; chest measurements, 33.64 and 36.80 inches.

Anthropometric students will find the details of these measurements in Table XXV.

Nativity.—Of every hundred of these recruits 68.3 were native Americans: White, 57.6; colored, 8.6; Indian, 2.1. Of the foreign-born recruits 9.4 came from Ireland, 9.2 from Germany, 3.1 from England, 2.2 from Canada, 1.6 from Sweden, 1.0 from Denmark.

Fuller details of the nativities, given in Table XXIV, may be compared with those of the men in service, as stated on page 67.

Occupation prior to enlistment.—About two hundred different callings or occupations were recorded on the enlistment papers by the recruits accepted during the year. It is therefore impossible to indicate in brief the results of an inquiry into this subject except by stating the number of men furnished by occupations, which are most prominent in this regard. Of the 9,585 men 2,240 placed themselves on record as laborers, and 13 of these were Indians; 2,052 as soldiers, but no Indian so reported himself; 1,188 as farmers. After these three classes there is a drop in the numbers to 377, who defined their occupation by the term clerk; but in addition to these there were 52 bookkeepers, 7 stenographers, 3 hotel clerks, 2 typewriters and 1 shipping clerk. There were 376 teamsters, drivers, and coachmen, with 92 hostlers and grooms, 16 farriers (not included among 96 blacksmiths), 2 horsemen, 3 horse-trainers, 2 liverymen, 2 jockeys, 1 riding teacher, and 1 an Indian horse-raiser. Musicians enlisted to the number of 214, with 1 music teacher and 2 piano tuners; carpenters, 204; painters, 186; cooks, 108; machinists, 106; butchers, 104; printers, 95; and bakers, 91. Eighty-six had no stated occupation, but 78 of these were Indians and only 8 white men. Eighty-six also were tailors, 77 miners, 76 barbers, 75 engineers, 74 shoemakers, and 69 sailors. The professional and commercial ranks furnished 1 physician, 7 lawyers, 3 dentists, 2 chemists, 39 druggists (mostly enlisted for the hospital corps), 6 newspaper men, 8 civil engineers and surveyors, 2 actors, 2 artists, 4 draftsmen, 62 schoolteachers, 26 students and schoolboys, 39 salesmen, 13 photographers, etc. See Table XXVI.

IDENTIFICATION OF DESERTERS.

The method of identifying deserters and other undesirable men who present themselves for enlistment has been in efficient operation since 1890. The first case of identity was reported July 19 of that year. Since then there has been a total of 432 identifications reported to the Adjutant-General of the Army, with, in addition, 13 cases of probable identity or suspicious similarity in which further investigation failed to develop sufficient confirmatory evidence to warrant a continuance of the inquiry.

Of the 432 identifications 306 were effected while the men were in service, 113 having been identified as deserters, 105 as convicts, and 88 as cases of fraudulent enlistment. The remaining 126 cases were identified after the termination of their enlistment, as the result of comparing their outline figure cards with their description on the form of examination of a recruit in use prior to the establishment of the card system; 90 of the men in these cases were deserters, 16 convicts, and 20 cases of fraudulent enlistment of other kinds.

HEALTH OF THE ARMY.

During the past year the health of the Army has been excellent. Perhaps at no time heretofore has the Surgeon-General been able to invite attention to a better record of health and consequent efficiency, and this although some of the rates have been materially increased by an undue proportion of sickness among the Indian companies.

The admission rate per thousand of strength was 1270.42, as compared with 1364.78 during the previous year and 1459.65 during the preceding decade. The lowest recorded admission rate, 1247 in 1887, is practically the same as that now reported. The number and duration of the cases were equivalent to a noneffective rate of 39.60, as compared with 42.01 during the previous year and 43.41 during the preceding decade. The nonefficiency may be expressed also by the statement that each officer and man of the Army was, on an average, sick for 14.5 days during the year, as compared with 15.3 and 15.9 days, respectively, during the previous year and each of the years of the previous decade. The number of men discharged for disability was 18.35 per thousand of strength, as against 17.23 (the lowest annual rate to which these discharges have been brought) in the previous year and 30.70 the average of the ten years preceding. The death rate from all causes was 6.44, comparing favorably with 8.05 and 8.75, respectively, for the previous periods already mentioned, as well as with 6.33 for the year 1889, the lowest annual death rate hitherto reported. Excluding deaths from injury the deaths from disease were equivalent to a rate of 4.36 per thousand of strength, as against 5.03 and 5.81, respectively, for the previous year and decade and against 3.95 for the year 1889.

In comparing our rates with those of foreign armies the admission rate is the only one which attracts attention by its magnitude; but this high rate does not indicate a greater prevalence of sickness among our men. It means simply that we take on sick report as a record of facts the cases of men who were excused from any part of their military duty on account of sickness or injury. The ailment may be so trivial—a few herpetic spots, for instance, on the lips of a bugler—that it would not be entered among the diseases affecting the command by medical officers of European services; but with us if the bugler is excused from sounding the calls on this account his case becomes a matter of record. It will be seen from a comparison of the other rates that notwithstanding the many trivial cases that form part of our record our nonefficient rate (39.60) compares favorably with that of the army of Austria-Hungary (43.58) and of the home service troops of Great Britain (44.29). The following tabulation gives a comparison of our rates with those of some of the armies of Europe, as obtained from their last published statistics:

Army.	Mean strength.	Ratio per 1,000 of mean strength.						Sick time for each soldier.
		Admission.	Deaths.			Discharges.	Constantly noneffective.	
			Disease.	Injury.	Total.			
United States, 1892	24,203	1,270.42	4.36	2.08	6.44	18.35	39.60	14.5
United States, 1891	23,269	1,364.78	5.03	3.02	8.05	17.23	42.01	15.3
United States, 1881–'90	23,945	1,459.65	5.81	2.93	8.75	30.70	43.32	15.9
Great Britain (home), 1890	101,770	810.61	4.74	.79	5.53	16.72	44.29	16.2
Austria-Hungary, 1891	284,743	890.75	3.94	1.53	5.47	61.87	43.58	14.8
Italy, 1891	220,714	810.57	8.06	.90	8.96	14.27	35.86	13.1
Prussia, Saxony, Würtemberg, 1889–'90	418,913	897.20	2.32	1.00	3.32	17.43	31.36	11.5

The above statement of the English and German armies is exclusive of officers.

The Italian troops stationed in Africa had a mean strength of 2,603 men, with an admission rate of 1,175 and a death rate of 13.4, and are not included in the above table; 9,645 men of the Italian army were granted sick leaves for periods varying from three months to one year.

The high discharge rate of the Austrian army was explained in the report of the Surgeon-General for 1891, page 94.

In the German army 6,845 additional discharges (16.34 per 1,000 of mean strength) were made of recruits for disabilities contracted prior to conscription.

Injuries stand first in order of importance as causative of admissions to sick report in our Army, 252.74 of the total of 1270.42 per thousand of strength having been occasioned by violence. Diseases of the digestive system take second place with 173.74 cases per thousand of strength. The third place is taken by diseases of the respiratory organs (124.45), mostly cases of catarrh and bronchitis; the fourth place by diarrheal diseases (110.85), and the fifth by specific febrile diseases (98.50), which owe their prominence in this as in other armies at the present time to the continued, although lessening, prevalence of influenza. Following these come sixth, diseases of the integumentary system, mostly boils and abscesses (79.99); seventh, venereal diseases (76.73); eighth, rheumatism, articular and muscular (71.52), and ninth, malarial diseases (63.75). In the foreign armies tabulated above the five principal causes of admission were in each as follows: Austro-Hungary: First, integumentary; second, digestive; third, respiratory; fourth, injuries; and, fifth, venereal. Great Britain: First, venereal; second, digestive; third, injuries; fourth, specific febrile; and, fifth, respiratory. Italy: First, venereal; second, respiratory; third, digestive; fourth, specific febrile; and, fifth, integumentary. Germany: First, integumentary; second, injuries; third, digestive; fourth, specific febrile; and, fifth, respiratory. The gratifying point in these comparisons is the low grade of precedence taken in our service by venereal and integumentary diseases.

As causative of nonefficiency, injuries take first place in the records of the past year, having occasioned 8.12 of the total of 39.60 constantly on the sick report per thousand of strength. Venereal diseases take second rank as a disabling cause, 5.33 men per thousand of strength having been constantly under treatment on their account. Specific febrile diseases, respiratory and digestive diseases, and rheumatism (including muscular) had each a noneffective rate of 3.3.

The absolute number of discharges for disability, which gave the rate of 18.35 per thousand of strength, was 493, of which 67 were for rheumatism and diseases of the bones and joints, 58 for injuries, 53 for consumption, 53 for venereal diseases, 44 for epilepsy and insanity, 44 for diseases of the heart and circulation, 27 for diseases of the eye, 14 of the ear, and 21 for hernia.

The absolute number of deaths was 173, of which 56 were caused by violence, 20 by consumption, 17 by pneumonia, 15 by diseases of the nervous system, 13 by typhoid fever, 13 by diseases of the heart, 8 by diseases of the kidney, 6 by influenza, and 3 by alcoholic poisoning.

The average strength of the Army, as shown by the returns of the Medical Department, was: White troops, 21,437; colored, 2,036; Indians, 730; a total of 24,203 men. There was little difference in the rates of admission for all diseases and injuries among these three classes of men, or in their noneffective rates. The former were: White, 1,273.45; colored, 1,257.86; Indian, 1,216.44; the latter 39.69, 38.55, and 39.97,

respectively. Although these general rates varied but little, the admission rates for certain diseases differed considerably. Thus, malarial diseases were less frequent among the colored men and Indians than among the whites, the rates being, respectively, 26.03, 31.51, and 68.43. Alcoholism, also, 8.35, 1.37, and 41.19. Headache and neuralgia were equally common, but no case of insanity was developed among either the colored men or Indians, although a total of 49 cases was recorded among the white soldiers. Diseases of the heart were likewise infrequent among the colored men and Indians. On the other hand, the colored man appears during the year to have been relatively more subject to chronic rheumatism of the joints and the Indian to diseases of the eye. Dyspepsia, colic, constipation, and inflammations of the lymphatic system were considerably, and venereal diseases somewhat, more frequent among both than among the white troops. Consumption was unusually prevalent among the Indians. A total of 26 cases gave a rate of 35.62 per thousand of strength, as against rates of 3.27 and 4.42, respectively, among the white and the colored troops.

The death rate of the white troops from all causes was 6.11 per thousand of strength, of the colored troops 5.00, of the Indians 20.43; from disease the rates were, respectively, 4.23, 3.18, and 11.49; and from injury 1.88, 1.82, and 8.94. The rate from disease among the Indians was mainly due to the cases of consumption, and the large rate from injury to an undue proportion of gunshot wounds.

The rates of our colored troops during the past year are very satisfactory. Admission, noneffective, death, and discharge rates are all not only lower than in any previous year but lower than the corresponding rates for the same period among the white troops.

HEALTH OF THE MILITARY DEPARTMENTS.

The admission rate was highest, 1,515.50, in the Department of the East, but all the other rates found their maximum in the Department of Texas—death rate from disease, 7.43, from all causes, 11.48; discharge rate for disability, 27.68; rate of noneefficiency, 54.25. The latter department must therefore be credited with the least satisfactory record. The Department of the Columbia had the lowest admission rate, 772.73, noneffective rate, 27.88, and death rate from all causes, 3.67; but the Department of California had only 1.54 deaths from disease and the Department of the Platte 12.32 discharges for disability per thousand of strength present during the year.

The admission rate was considerably above the average of the Army, 1,270.42, in the Department of the East, 1,515.50; and of Texas, 1,460.51. It differed but little from the average in the departments of Dakota, the Missouri, and Arizona, while in the departments of the Platte, of California, and of the Columbia it was considerably less, respectively, 1,079.25, 953.07, and 772.73.

The noneffective rate of the Army, 39.60, was slightly exceeded by those of Dakota, Arizona, and the East, 40.29, 41.55, and 42.56, and very considerably by that of Texas, 54.25. This rate in the other departments was notably less: Columbia, 27.88, Platte, 31.74, California, 32.16, and Missouri, 35.84.

The death rate from all causes was highest in the Department of Texas, 11.48, and higher than the average of the Army, 6.44, in the departments of Arizona and of the East, 8.23, and 8.17, respectively. It varied but slightly from the average in the departments of the Platte, Missouri, and Dakota, 6.16, 5.74, and 5.57, and was considerably

below the average in the departments of California and of the Columbia, 3.85 and 3.67, respectively.

The rate of discharge for disability, which for the Army was 18.35, differed by more than three units in none of the departments except those of Texas and Arizona on the one hand and the Platte on the other, which had, respectively, 27.68, 21.81, and 12.32.

When the figures indicating the influence of injuries, alcoholism, venereal diseases, and vaccina on the rates of sickness and mortality are dropped from the medical statistics of the various departments the comparative repute of the departments as just stated is not materially altered. Thus the Army is found to have an admission rate of 857.74, which is largely exceeded in the departments of the East and Texas, 1,027.39 and 1,023.64. The rates of the departments of the Missouri, Dakota, and Arizona do not differ materially from the average, while that of the Platte, 713.82; California, 563.08; and the Columbia, 486.08, are considerably smaller. The noneffective rate of the Army, 24.42, was slightly exceeded in the departments of Dakota, the East, and Arizona, 24.69, 25.51, and 26.80, and very considerably in Texas, 34.87. The rates in the departments of California, the Columbia, the Platte, and the Missouri were notably less, 17.23, 18.19, 18.73, and 21.70, respectively. The death rate was highest in Texas, 7.43, and higher than the Army average, 4.25; in the East, 5.45, and in Arizona, 5.76. It varied but little from the average in the Missouri, 3.35; Dakota, 3.71, and the Platte, 3.64, and was considerably below it in California, 1.54, and the Columbia, 2.94. The discharge rate, which for the Army was 14.18, was large in Texas, 20.92; small in the Platte, 8.96, and in the other departments lay between these extremes. Taking all the rates into consideration it would seem that during the year the Department of Texas had the worst record, and the Department of the Columbia decidedly the best.

DEPARTMENT OF THE EAST.

This department, with a mean strength of 6,613 men, had per thousand of strength present 1,515.50 admissions; 42.56 men constantly sick; 8.17 deaths, and 18.30 discharges for disability. The excess of admissions was due to no special epidemic, but to an increased prevalence of all diseases. Thus the specific febrile diseases, which include the cases of influenza, caused 116.89 admissions, as against 98.50 in the Army; diarrhea, 151.82, as against 110.85; venereal diseases, 99.65, as against 76.73; vaccina, 95.27, as against 45.45, and so on.

The posts which chiefly contributed to the excess of sickness in the department were the two recruiting depots, Columbus Barracks, Ohio, and Davids Island, N. Y., with Fort Hamilton, N. Y., and Washington Barracks, D. C. The depots had admission rates of 2,059.23 and 2,115.32, and noneffective rates of 71.98 and 46.31, respectively, while Fort Hamilton had 2,354.96 and 48.04, and Washington Barracks 1,981.93 and 43.22. Some of the large posts, as Fort Thomas, Ky., and Fort Wadsworth, and Willets Point, N. Y., had very fair records, and a few, such as Fort Columbus, N. Y., and Fort Warren, Mass., excellent records. The admission rate of Fort Columbus was 815.57, and its noneffective rate 38.31; the rates of Fort Warren were 608.70 and 22.14.

DEPARTMENT OF THE MISSOURI.

This department, with an average strength of 4,178 men, had an admission rate of 1,251.08, a nonefficient rate of 35.84, the death and

discharge rates being 5.74 and 15.56. The admission rate in its totality was similar to that of the Army, but there were some differences in the prevalence of certain classes of disease. Thus influenza, malarial and integumentary diseases were relatively more frequent than in the Army as a whole, the first 90.24, as compared with 74.08; the second 119.67, as compared with 63.75, and the last 87.84 as compared with 79.99; but these excesses were offset by a relative diminution of several other classes, rheumatism giving a rate of only 52.18 instead of 71.52; diseases of the nervous system 39.73 instead of 49.29; of the respiratory system 112.73 instead of 124.45, and of the digestive system 164.91 instead of 173.74.

But for the post of Fort Reno the fair record of this department would have been much better than it is. This post had an admission rate of 1,917.72 and a noneffective rate of 67.57. Forts Sill and Sheridan had larger admission rates than the average, but the cases forming the excess were evidently of a trivial nature as the noneffective rates were not correspondingly increased. The records of Forts Leavenworth and Riley were good, and those of the prison at the former post and of the cavalry recruiting depot at Jefferson Barracks were excellent.

DEPARTMENT OF DAKOTA.

Average strength, 3,233 men; admission rate, 1,276.83; noneffective 40.29; deaths, 5.57; discharges, 20.11. In this department, with rates similar to those of the Army, there was an excess of injuries, specific febrile diseases (mostly cases of influenza), and rheumatism, offset by a diminished prevalence of malarial and venereal diseases, alcoholism and vaccina; injuries, 291.99 instead of 252.74; influenza, 118.16 instead of 74.08; and rheumatism, 86.30 instead of 71.52, with malarial reduced to 13 30 from 63.75; venereal, 54.12 from 76.72, alcoholism, 29.38 from 37.23. and vaccina, 25.36 from 45.45.

The highest rates were given by Fort Yates; admissions, 1,567.57, non-effective 64.98. Those of Forts Meade, Snelling, and Sully were somewhat over the average; that of Fort Keogh was fair, and of Fort Missoula excellent; admissions, 603.17; noneffectives, 20.64 per thousand of strength.

DEPARTMENT OF THE PLATTE.

Average strength, 3,571; admissions, 1,079.25; noneffectives, 31.74; deaths, 6.16; discharges, 12.32. In this department there was a notably lessened prevalence of all diseases and injuries except in the three instances of alcoholism, rheumatism, and tonsillitis, in each of which there was a slight increase.

The rates of Fort McKinney were considerably above those of the Army. Fort Robinson's excess of cases were of a trivial character. Forts Niobrara and Omaha had average rates; Fort Logan good, and Fort Washakie excellent, the last mentioned having had only 677.42 admissions and 20.27 noneffectives.

DEPARTMENT OF TEXAS.

Average strength, 1,481; admissions, 1,460.51; noneffectives, 54.25; deaths, 11.48; discharges, 27.68. Notwithstanding the relatively heavy rates of this department, it had a lessened incidence of disease under certain headings, as catarrh and bronchitis, 72.92 instead of 109.41;

tonsillitis, 19.58 instead of 41.90; rheumatism, 54.70 instead of 71.52; alcoholism, 28.36 instead of 37.23; and vaccina, 18.23 instead of 45.45; but the increased prevalence of all other diseases more than offset these advantages. The more important of the excesses were, specific febrile diseases, 126.94 instead of 98.50; malarial, 117.48 instead of 63.75; diarrheal, 158.67 instead of 108.03; venereal, 106.01 instead of 76.73; integumentary, 133.03 instead of 79.99, and injuries, 284.27 instead of 252.74. The increase in the rate of nonefficiency was mainly due to the cases of malarial fevers, which caused a constant sickness of 5.90 per thousand of strength, as compared with 1.76 in the Army; venereal, 8.01 as compared with 5.32; injuries, 10.66 as compared with 8.12, and specific febrile diseases, 5.26 as compared with 3.35.

The large rates of the department are owing chiefly to the prevalence of disease at Forts Sam Houston, Clark, and McIntosh. Fort Brown continues to preserve its excellent record: Admissions, 576.27; noneffectives, 36.91, more than 50 per cent of the latter relatively large rate having been due to injuries.

DEPARTMENT OF ARIZONA.

Average strength, 2,430; admissions, 1,251.44; noneffectives, 41.55; deaths, 8.23; discharges, 21.81. Injuries and diseases of the digestive organs were more prevalent than in the Army as a whole. Rheumatism was also more frequent, 100.82 as compared with 71.52, notwithstanding the hot and dry climate. It is to be observed, also, that notwithstanding the same hot and dry climate heatstroke was infrequent, 1.23 as compared with 2.77 in the Army, and notwithstanding the former repute, or, rather, disrepute, of the department as a hotbed of malaria, the admission rate for malarial diseases, 31.27, is only 50 per cent of that of the Army as a whole—63.75. Influenza was also less prevalent.

Most of the posts had rates which varied little from the average. Fort Marcy had the heaviest, 1,886.18 admissions and 56.53 noneffectives; Fort Huachuca the lightest, 899.37 admissions and 24.54 noneffectives.

DEPARTMENT OF CALIFORNIA.

Average strength, 1,300; admissions, 953.07; noneffectives, 32.16; deaths, 3.85; discharges, 16.15. Notwithstanding the low rates of this department it had a slight excess, over the average, of diseases of the eye, ear, and nervous system, and a marked excess of venereal cases, 91.54 instead of 76.73. The Presidio of San Francisco, at which one-third of the strength of the department is aggregated, had an excellent record for so large a post: Admissions, 1,034.41; noneffectives, 35.48. The rates at Benicia Barracks were low, 825.76 and 21.24.

DEPARTMENT OF THE COLUMBIA.

Average strength, 1,364; admissions, 772.73; noneffectives, 27.88; deaths, 3.67; discharges, 18.33. The admissions for disease in this department amounted only to 573.31 per thousand of strength as compared with 1,017.68 in the Army as a whole. The only disease which prevailed in excess of the Army rate was pneumonia, of which the absolute number of cases was 7.

Fort Canby is the only post which exceeded the average of the Army in its rates: Admissions, 1,292.45; noneffectives, 54.85. Vancouver Barracks and Forts Spokane and Sherman had excellent records.

HEALTH OF INDIVIDUAL POSTS.

One hundred and fourteen stations were garrisoned during the year, 39 by less than 100 men each, average 53; 29 by 100 to 200 men, average 141; 15 by 200 to 300 men, average 253; 16 by 300 to 400 men, average 353, and 15 by 400 to 700 men each, average 504. Some detachments were on duty in the field.

In former reports it has been noted that the prevalence of sickness was in a general way proportioned to the strength of the command, posts with a strength of over 200 men having had rates of admission and nonefficiency higher than the average and smaller posts having had rates correspondingly lower. This was explained on the assumption that at large posts men with trivial ailments were taken on sick report, while at smaller posts, where every available man was required to carry on the current work, the same ailment would be treated without a formal recognition of its existence. During the past year, however, this rule has not held good. While all the posts have lessened their rates, the largest posts (those with over 400 men) have been so successful in effecting this as to bring their sickness down to the average. The smaller posts continue below the average, but their low rates are offset by the posts garrisoned by 200 to 400 men. Whether the present low rates of the large posts is an accidental occurrence remains to be seen. They could with all due propriety be claimed as the result of the careful sanitary supervision that has been exercised in view of the possibility of invasion by cholera.

Fifteen posts, garrisoned by 400 to 700 men each.—Average strength, 504; aggregate strength, 7,561 men; admissions, 1,288.06; noneffectives, 39.73; deaths, 5.03; discharges, 17.46. The slight difference between these death and discharge rates and those of the Army are in favor of the posts.

Of the fifteen posts, those having the heaviest rates of admission are the recruiting depots at Columbus Barracks, Ohio, and Davids Island, N. Y. The third depot, at Jefferson Barracks, Mo., also included among the fifteen, stands in favorable contrast with the two others. Omitting for the present the consideration of these depots, there are twelve posts in this class, four of which have admission rates higher than the average of the Army and eight lower. The former are Forts Sam Houston, Tex., Meade, S. Dak., Sheridan, Ill. and Snelling, Minn., recording respectively 1,683.84, 1,556.90, 1,409.87, and 1,351.94. The latter begin with Fort Omaha, Nebr., 1,223.60, and including in order Fort Riley, Kans., Fort Assinniboine, Mont., Fort Leavenworth, Kans., the Presidio of San Francisco, Cal. and Fort Douglas, Utah, end with Fort D. A. Russell, Wyo., 766.90 and Vancouver Barracks, Wash., 727.27. The nonefficient rates at these posts correspond with the admission rates in their position above or below the average, except at Fort Sheridan, where the nonefficiency, 34.32, was lower than is ordinarily associated with an admission rate of over 1,400.

At Fort Sam Houston the excess of sickness was occasioned by diarrheal and integumentary diseases, injuries, influenza, malarial fevers and alcoholism. Although there were few cases of malarial fever, and less than the average of venereal disease and vaccina at Fort Meade, its admission rate was raised by an unusual prevalence of headaches and neuralgia, tonsillitis, dyspepsia, colic, constipation and other diseases of the digestive system, with contusions, sprains, lacerations and other injuries. At Fort Sheridan, malarial fevers, rheumatism and tonsillitis were comparatively infrequent; but this was more than offset by

an increased prevalence of influenza, venereal disease and diseases of the digestive system. Fort Snelling was free from malarial fevers and influenza, but its admission rate was kept up by diarrhea, rheumatism, tonsillitis, venereal diseases, vaccina and injuries. The rates for specified diseases were lower in every instance at Fort D. A. Russell and Vancouver Barracks, except in the case of tonsillitis at the former and alcoholism at the latter.

The death rate at these large posts, 5.03, was smaller than the average, 6.44. Jefferson Barracks and the Presidio of San Francisco had no death during the year. The largest number, 7, occurred at Columbus Barracks, giving a rate of 11.84; 4 of these deaths were from pneumonia. Forts Sheridan and Sam Houston had each 5 deaths, of which 2 at each post were from injury.

The discharge rate, 17.46, was slightly below the average. The largest rate, 41.16, was that at Fort Meade, where 17 men were discharged; but the largest absolute number was 18 at Fort Omaha. Fort Sam Houston had 16 cases; the Presidio of San Francisco 2, which was the smallest number. The largest number from one cause at any post was 5, from consumption, at Fort Omaha, to which post cases were sent to be under the observation of the medical director, prior to their discharge.

Sixteen posts garrisoned by 300 to 400 men each.—The average admission rate of these was considerably, and the nonefficient rate slightly, above the average of the Army. Two had the Army average of admission, nine more than this, and five less. Washington Barracks, D. C., had the largest admission rate, 1,981.93, closely followed by Fort Reno, Okla., with 1,917.72, but the cases at the latter were of greater gravity, occasioning the high nonefficiency of 67.57. The excess at Washington Barracks was caused principally by malarial diseases, headache and neuralgia, venereal disease, and alcoholism. The malarial rate was unusually high, 563.25, as also the venereal and alcoholic, 156.61 and 30.24 respectively, the former causing a nonefficiency of 9.69. The excess at Fort Reno was caused by an increased prevalence of malarial and typhoid fevers, catarrhs, diseases of the digestion and injuries, the fevers mentioned having added 20 to the rate of nonefficiency. At Fort Monroe, Va., the excessive admission rate, 1,797.33, was due to diarrhea, specific febrile and venereal diseases. At Fort Sill, Okla., the rate of 1,653.18 includes 474.00 contributed by malarial fevers; while at Fort McPherson, Ga., the rate of 1,634.09 may be said to have been made up in its excess of venereal diseases and alcoholism, one out of every five men in the garrison having been under treatment for the former and one out of every eight for the latter during the year. The other posts having admission rates above the average are Fort Clark, Tex., Fort Custer, Mont., West Point, N. Y. and Fort Wingate, N. Mex. The excess at Fort Clark was occasioned by malarial, diarrheal and venereal diseases; at Fort Custer by specific febrile, venereal diseases and affections of the digestive system; at West Point by specific febrile diseases, rheumatism, catarrhs and injuries, and at Fort Wingate by injuries. Forts Keogh, Mont., and Robinson, Nebr., had the average admission rate of the Army; but at the latter post a considerable excess of rheumatism and injuries was offset by diminished rates under many other headings. The engineer station at Willets Point, N. Y., Fort Niobrara, Nebr., Madison Barracks, N. Y., and Fort Logan, Colo., had good records, which would have been improved had there been less diarrhea and alcoholism at Fort Niobrara and less alcoholism at Madison Barracks, the admission rate

at this post having been 95.24, instead of 37.23, as in the Army generally. The post having the best record in this series was Fort Huachuca, Ariz., its admission rate only 899.37 and its nonefficient rate 24.54.

The death rate at these posts was 7.97, somewhat higher than the average, for which Forts Sill, Reno, and Keogh with 5 deaths each, and Madison Barracks with 4 deaths, were mainly responsible. Three deaths at Fort Keogh and one at Madison Barracks were caused by injury. The five at Fort Sill were caused, 2 by enteric fever, 2 by consumption, and 1 by injury.

The discharge rate was 15.05, rather smaller than the average. The highest rates, 28.90, 28.48, and 27.03, were furnished by Forts Sill and Reno and Madison Barracks, respectively, caused by 10, 9 and 9 discharges. Three of the cases at the last-mentioned post were due to rheumatism; the others were reported under various disease headings.

Fifteen posts garrisoned by 200 to 300 men each.—The average rate of admission, 1,330.08, was lower than in the last series, the rate of nonefficiency, 43.58, higher; in both instances in excess of the average rates of the Army. Eight of these had high rates; seven low. At four of the eight the rates were unusually high as compared with others in this series. Fort Hamilton, N. Y., had an admission rate of 2,354.96, which, according to the record, was occasioned by malarial fevers, 221.38 as against 63.75 in the Army generally; diarrheas, 381.68, as against 108.03; catarrhs and common colds, 450.40, as against 30.78, and injuries, 366.41, as against 252.74. The increasing sick rate at this post for several years back was noted in the last report of the Surgeon-General (p. 33), and the sanitary reports of the medical officers on duty were examined without success to ascertain the causes. A call was, therefore, made on the post surgeon, whose special report on the sanitary conditions as bearing on the prevalence of disease will be found below (p. 32). It seems probable that the views of the commanding officer indorsed on the said report are correct, and that the all-night pass indulgence had more to do with the unusual prevalence of catarrhs and common colds, diarrheas and injuries than any climatic or local sanitary conditions. The influence on the sick list of the withdrawal of this indulgence will be reported hereafter. At Fort Supply, Ind. T., the admissions reached the high rate of 1,801.50, chiefly through a visitation of influenza, which caused 531.64 as compared with the average of the Army, 93.71; diarrhea and bronchitis were also unduly prevalant. Malarial fevers and injuries in excess occasioned the large rate, 1,618.64, at Fort Myer, Va., the former caused 466.11 admissions as compared with 63.75, the average of the Army. Nonefficiency among the posts in this series was greatest at Fort Yates, 34.98, as compared with the Army rate of 39.60, and was occasioned by enteric fever, bronchitis, rheumatism and injuries. The post of Angel Island, Cal., had excellent rates, admission 960.14, nonefficiency 36.63; but Fort Sherman, Idaho, presented the best record of any in the series, admission rate 637.93, nonefficient 25.73.

The death rate was similar to that of the Army. Angel Island, Cal., Fort Thomas, Ky., and Fort Supply, Ind. T., had no death, but Fort Grant, Ariz., had 4, and Forts Bayard, N. Mex., Adams, R. I., Yates, N. Dak. and Myer, Va., 3 each.

The discharge rate, 23.18, was larger than the average, caused in great part by 14 cases at Fort Grant, and 13 at Angel Island.

Twenty-nine posts garrisoned by 100 to 200 men each.—The average admission rate in this series was 1,157.36, and the nonefficient 37.68, as against 1,270.42 and 39.60 in the Army. Eleven had admission rates

higher than the Army averages; eighteen lower. The more notable of the eleven were St. Francis Barracks, Fla., 1,967.48; Fort Marcy, N. Mex., 1,886.18; Mount Vernon Barracks, Ala., 1,817.68; Fort Ringgold, Tex., 1,716.42, and Jackson Barracks, La., 1,650.94. The first-mentioned post had an excess of all diseases, specially marked in the cases of influenza, diarrhea, alcoholism, syphilis, rheumatism and diseases of the digestive organs and integuments. At Fort Marcy there was a similar excess of all diseases, diarrhea excepted. At Mount Vernon Barracks malarial and venereal diseases and injuries contributed chiefly to the excess. At Fort Ringgold, which had the highest nonefficient rate, venereal diseases gave an admission rate of 208.97; alcoholism, diseases of the integuments, and injuries also added to the high rates. At Jackson Barracks the rate for venereal disease was 198.11, and for alcoholism 179.23. The post of Fort Apache was indicated in the last report of the Surgeon-General (p. 33) as one of those which had been the subject of an increasing prevalence of sickness during several years past, although the sanitary reports had failed to show satisfactorily why this should have been the case. The post surgeon was therefore called upon to forward a special report on the sanitary condition as bearing on this question. His report, given below (p. 34), shows that while imperfect shelters and inadequate systems of police and sewerage exercised a harmful influence, the main cause was an increasing impurity of the water supply. The posts in this series having excellent rates are quite numerous, no less than ten of them having admission rates of less than 1,000 per 1,000 strength. The lowest admission rate, 518.52, was furnished by Fort Spokane with 25.26 nonefficient; the lowest nonefficient rate by Fort Mackinac, Mich., 15.48, with 736.84 admissions.

The death rate, 7.81, was above the average; the largest absolute number at any post was 3 at Benicia Barracks, giving a rate of 22.73.

The rate of discharge for disability was 22.45, also above the average; the largest absolute number, 8, occurred at each of three posts: Jackson Barracks, La.; St. Francis Barracks, Fla., and Fort McHenry, Md., giving rates respectively of 75.47, 65.04, and 50.00.

Thirty-nine posts, garrisoned each by less than 100 men.—The average rates of this series were lower than the corresponding rates of the Army: Admissions, 1,099.66, as compared with 1,270.42; nonefficient, 33.52, as compared with 39.60. At twelve posts the admissions were relatively more numerous than in the Army generally; at twenty-seven they were relatively less numerous. At posts in this series, having over 50 men each, the highest admission rate was reported from Camp Eagle Pass, Tex., 2,113.21, with 76.30 nonefficient; Fort Barrancas, Fla., reported 1,986.67, with 70.64; Sandy Hook Proving Grounds, N. J., 1,884.62, with only 19.13 nonefficient, and Fort Hancock, Tex., 1,860.00, with 44.65. The average death rate of these posts was high, 9.24; the discharge rate, 18.47.

In the field the rates were low, naturally, as the service in each case was not protracted. Admissions, 879.21; nonefficient, 13.93; death, 4.91.

The recruiting depots, Columbus Barracks, Ohio, Davids Island, N. Y., and Jefferson Barracks, Mo., belong to the class of posts garrisoned by over 400 men each, but differ from the others in that series in the unfamiliarity of the men with military discipline and methods. The admission rates of Columbus Barracks and Davids Island were, respectively, 2,059.23 and 2,115.32, and the nonefficient, 71.98 and 46.31; but as these rates are considerably increased by the vaccinations required by Army regulations, many of the recruits taking advantage of the slightest excuse to be relieved from drill or other uncongenial work, their comparison

with the rates of other posts can be made satisfactorily only when the excess of vaccina has been deducted. When thus corrected for comparison the admission rate of Columbus Barracks is found to be 1,881.35, and its nonefficient rate, 64.78; of Davids Island, 1,600.41 and 31.28. The rates of the former station are exceedingly high, as is also the admission rate of the latter. When it is stated that at Columbus Barracks the admissions for venereal diseases numbered 292.72 per thousand of strength, and that these accounted for a nonefficiency of 18.54, the causation and general character of the excess of sickness may easily be understood. Instead of undergoing a systematic course of athletic exercise to develop their physique, nearly 30 per cent of these recruits pass a great part of their period of instruction on the sick list for diseases resulting from dissipation. The excess of admissions at Davids Island was mainly made up of slight cases of diarrhea and injury, the venereal rates being only 43 24 and 1.78. At Jefferson Barracks, notwithstanding an excess of malarial diseases, 193.69, as compared with the army rate of 63.75, and an excess of venereal, 136.37, as compared with 76.72, the admission rate for all diseases, less the excess of vaccina, was only 835.96, with a nonefficiency of 31.34.

Of the posts having bad records during the year, three had the admission rate over 2,000 per thousand of strength, Fort Hamilton, Davids Island, and Columbus Barracks; four ranged from 2,000 to 1,900, Fort Barrancas, Washington Barracks, St. Francis Barracks and Fort Reno; three from 1,900 to 1,800, Fort Marcy, Mount Vernon Barracks and Fort Supply, and two from 1,800 to 1,700, Forts Monroe and Ringgold. Of the posts having the highest nonefficient rates three reported 70 and over per thousand of strength, Columbus Barracks and Forts Barrancas and Ringgold; four ranged from 70 to 60, Forts McIntosh, Reno, Yates and Clark; and nine from 60 to 50, Forts Bayard, Sam Houston and McPherson, Jackson Barracks, and Forts Marcy, Canby, Custer, Wayne and McHenry. The causes of the high rates at most of these posts have already been indicated briefly. Excluding the recruiting depots, arsenals and smaller posts, Fort Barrancas may be regarded as presenting the worst record. In 1889 and prior years this post had rates rather lower than the average. Since that year they have been unusually high, mainly caused by diarrhea, alcoholism and diseases of the integuments. It has been suggested that the cutting down of some trees in a marshy locality between the water line and the post was the cause of the increased sickness, but the rate for malarial disease does not sustain this theory.

Exclusive of the smaller posts and arsenals, those posts having the best admission rates were Fort Spokane, with 518.52, and Forts Washakie, Missoula, Niagara and Sherman, with rates ranging from 600 to 700. The best nonefficient rate, 15.48, was reported from Fort Mackinac. The rates ranged from 20 to 25 at Forts Washakie, Wadsworth, and Missoula, Benicia Barracks, and Forts Warren and Huachuca.

The special reports on the sanitary conditions at Forts Hamilton and Apache are as follows:

FORT HAMILTON, N. Y., *Major Ezra Woodruff:* Fort Hamilton is situated on the southwest shore of Long Island, on the Narrows, latitude 40° 43′ north, longitude 74° 1′ west, distant about 6 miles from New York City. The elevation of the land is from 30 to 60 feet above the sea-level. The reservation contains 153 acres, of which 53 have been lately added by purchase. The addition is much lower than the older part and slopes to the sea-level at the Dyker meadows.

Fort Hamilton proper is at present only occupied by the regimental band, guard, prisoners, and several married soldiers. The four batteries are quartered in brick barracks, irregularly located on the reservation; two of these were built in 1890.

Most of the officers' quarters front on the village street, called Fort Hamilton Avenue.

The climatic conditions prevailing are the same as those of New York City, Brooklyn, and the Eastern shore generally. The climate is variable and liable to sharp and sudden changes. The average annual temperature is 49° to 51° Fahr. There is marked irregularity in the rainfall; average annual amount, 42 inches. Prevailing winds southeast in winter and southwest in summer.

The soil is of glacial drift origin, and contains immense numbers of boulders. It consists of red clay with more or less sharp sand intermixed, and presents a very uneven surface, small hills or knobs with corresponding depressions dotting the country around the post. In these little valleys there are collections of water forming either permanent or temporary ponds; not so numerous as they were some years since, when it was calculated by a good authority that there were sixty ponds within a radius of 1 mile of the post.

While the soil is generally of red clay mixed with sand, there are spots where peat bogs exist. One of these was situated in the center of the reservation and has been filled in with earth. The Dyker meadow is a large bog of many acres in extent, which adjoins the reservation on the east. The large central area, about 9 acres in extent, now surrounded irregularly by buildings, resembles the bottom of a shallow dish, into which pours the drainage from all sides, and from which there is no natural outlet. The surface water is absorbed by the soil. The center of this area is the site of the old peat bog, on which many thousand cubic yards of earth were placed at an expense of $17,000. The result has been the formation of a level plain, but too low for natural drainage.

The drainage of the post is by means of earthen pipes of various sizes, which carry the house waste and sewage from all the buildings into tide water. The system is good and serves its purpose thoroughly.

The water used for the last six years is furnished by the Brooklyn City Water Works. It comes from small lakes and driven wells on Long Island. It is supplied to all necessary buildings, which possess all the modern conveniences. The supply is unlimited and the quality good.

The sanitary condition of the post is good. Policing is thoroughly and systematically attended to. There is no chance for filth to collect because of the constant efforts to prevent it.

The region about Fort Hamilton has changed very much within the last six years. It has ceased to be country and has become a suburb of Brooklyn. Many miles of new streets have been cut through, hills have been leveled and valleys filled, and a vast extent of new earth has been exposed.

In the above statement I have endeavored to present the physical characteristics of Fort Hamilton, which may be a basis for the formation of a correct opinion as to the causes of the increase of sickness during the last six years. In my opinion Fort Hamilton well deserves its reputation as a malarious region. Malaria and its allied diseases have prevailed here for many years. I think the existence of the ponds are among the main causes of the prevalence of this class of disorders, but as they have existed for a long period of time and even in greater numbers than they do now they can not have caused the increase in the sickness at this post in the last six years; but I believe they are still an active factor. When last summer the long drouth caused the ground water to sink and many ponds dried up there was a decided increase in the cases of intermittent fever. The rapid and extensive disturbance of the soil made by grading and opening new streets has been a cause of increased sickness. The winter climate here also produces cases of zymotic diseases. Colds, tonsillitis and attacks of acute catarrh follow the severe storms which strike the Long Island shore at this point.

In May, 1890, the Fifth Artillery left this station after a nine years' occupancy. The numerical strength of the command was small; there were few new recruits; many of the men were married and nearly all were thoroughly acclimated. The First Artillery took station at this post in May, 1890, coming from the Pacific coast. In that year, also, the strength of the batteries was increased and numbers of recruits were received, many of them from the interior, thus causing such a change in the garrison that increased sickness may have resulted.

The attractions outside the post, in the shape of liquor saloons and other temptations to immorality in causing irregular habits, may have caused an increase in the sickness.

There was a severe epidemic of influenza in December and January, 1889 and 1890, leaving an epidemic influence behind, which again broke out with violence in December and January, 1891 and 1892. These epidemics have aided in increasing the number of cases taken sick.

In 1889 one company was sent to Fisher's Island for target practice. This was a notoriously unhealthy camp, and in September, 1889, there were 13 cases of intermittent and remittent fever, most of them due to their stay at Fisher's Island.

Col. Langdon, First Artillery, commanding the post, indorses on this report his views, as follows:

The enlisted men are not restrained as much as formerly from opportunities for indulgence in dissipation. This results partly from the liberty of remaining out of barracks till eleven o'clock at night. Then, too, there is a mistaken idea that giving the men all the indulgence possible will lessen desertion, and this leads to the too indiscriminate granting of "all-night passes." Men who dissipate all night do not feel much like attending to duty in the morning, and indeed must, in many cases, be really ill, and should, whether saints or sinners, have medical attention.

Many such cases would puzzle any physician, and a complaint that would not keep a laboring man from his work one hour will, in the case of a soldier, relegate the sufferer to the hospital. The "all-night pass" indulgence has been suspended.

FORT APACHE, ARIZ.—*Capt. N. S. Jarvis:* Fort Apache is situated on a bluff bordering the east fork of the White River, a small stream which takes its rise by two branches in the Sierra Blanco Mountains of Arizona. The post lies in longitude 109° 54′ west from Greenwich, latitude 33° 47′ north. The country for miles around about has been the theatre of violent volcanic eruptions, of which marked traces are present on all sides. The banks of the White River, at various parts of its course, consist of basaltic volcanic rock, which has been partly cut through by the river, and by the excavating action of the water huge fragments have been detached and thrown into its bed. The bluff on which Fort Apache stands is made up largely of volcanic rock, which has been gradually concealed from view by sedimentary deposits of sand and gravel. Through breaks in the volcanic layers strata of carboniferous rock are at points brought to view, as at the south end of the post at the site upon which the present reservoir stands, and on the opposite side of the White River, where an abundance of good building lime is available. Limestone and gypsum are more or less abundant on the river banks, and are of importance as touching the composition of drinking water.

The canyon of the east fork, which bounds the post on the north, has an average depth of 100 feet, and runs approximately 25 to 100 yards from the line of the officers' quarters.

The valley of the White River at this point—the confluence of the north and east branches—is narrow and shut in by elevated bluffs of volcanic origin. The only apparent outlet is to the west down the river. Otherwise the post is "boxed in," as it were, giving the vicinity a peculiarly somber character. I have heard old and experienced officers speak of the depressing effects peculiar to the locality.

The White River is a narrow stream with a swift current, and the flat ground in its bed is covered with brush, and at frequent intervals volcanic rocks. At some parts of its flow the river bottom is spread out, and these sections are extremely productive to the Indian farmers, who have "taken up" much of the land. The most extensive patches of this land lie on the east fork, and for a distance of 10 to 12 miles the Indian farms extend. I am informed that the acreage has increased 100 per cent during the last five years. The necessary water for irrigation is, of course, derived from the river.

The barracks are of two kinds—frame weatherboarded structures and adobe. They are seven in number, and comprise three adobe and four weatherboarded structures. The adobe buildings are of comparatively recent construction, and better adapted to proper quartering of troops than the frame structures. The barracks are numbered, from west to east, 1 to 7.

No. 1, of adobe brick one foot in thickness, is a comparatively new structure. Like all the barracks to be described it is in the shape of a double L. The west or right-hand wing is intended for use as kitchen and mess room, the left-hand or east wing as a squad room.

The main barrack room measures 106 by 24 by 12, giving a capacity of 30,528 cubic feet; the squad room 59 by 24 by 12, giving 16,992 feet. Ventilation for this structure was provided for by three small slatted frame windows 2 feet by 2 feet 6 inches at the east gable of the main room and both gables of the wings. These slatted ventilators open into the barrack loft, and fresh air is supposed to enter the barracks through trapdoors in the ceilings, which I would state parenthetically are too often closed by the men. At present this building is occupied as the "post exchange."

No. 2 is a frame weatherboarded structure built some years back. Its size is as follows: Main dormitory 106 by 24 by 12 feet; squad room 58 by 25 by 11 feet. It is entirely devoid of artificial means of ventilation, the trap-doors opening into a closed loft. At present the building is used by the Interior Department as storeroom and schoolhouse.

No. 3, an adobe structure, is similar in design and appearance to No. 1. Main barrack room 105 feet 8 inches by 24 feet by 12 feet 4 inches; squad room 59 feet by 24 feet by 12 feet. The main room is occupied by 39 men of F Company,

Eleventh Infantry. The squad room is used as an amusement resort. No systematic ventilation whatever was provided for this building. Two trapdoors, 2½ feet by 3 feet, open into a closed loft. Otherwise the structure is comfortable and well arranged. Being of adobe it retains the heat much more satisfactorily than the weatherboarded barracks. The west wing is used as kitchen and mess room. Adjoining the kitchen is a small lavatory provided with hot and cold water.

No. 4, a frame weatherboarded structure, is now occupied by I Company (Indian), Eleventh Infantry. The main barrack room measures 106 feet 7 inches by 11 feet 9 inches by 12 feet and shelters 49 men. Opening into a closed loft at each end of the ceiling are two trapdoors 2 feet by 3 feet. There is therefore no ventilation for these men except by the accidental opening of a door or window. As there are many cracks and other defects in the walls, heating of the room is difficult. The squad room in the left wing has an area of 11 feet 3 inches by 24 feet by 58 feet, and holds at present 27 men. Ventilation, at my instigation, was recently partially provided for in the shape of a ridge-pole ventilator 3 feet 6 inches by 2 feet 6 inches, with the usual trapdoor, which is so frequently closed by the men. As in other barracks, the right-hand wing comprises kitchen and mess room, with small lavatory attached.

No. 5, occupied now by H Company, Eleventh Infantry, of same general ground plan, has the following measurements: Main barrack room 105 feet 10 inches by 24 feet by 12 feet 4 inches; squad room 33 feet by 24 feet by 12 feet. The company, comprising 36 men, is confined to the main dormitory; the squad room utilized as amusement room. Some attempt to ventilate was made in building this structure, but it is merely an excuse for proper ventilation. At each gable of the main building and wings is a small slatted window 4 feet by 5 feet. Opening into the loft are six good-sized trapdoors, through which change of air can take place. The right wing contains kitchen, mess room, and lavatory.

No. 6, a weatherboarded building of same general design and workmanship, has approximately the same proportions. The right wing is utilized as schoolroom for enlisted men. Ventilation is supposed to occur through opening of windows or doors. The rest of the building is used as a storehouse.

No. 7, now occupied by D Troop, First Cavalry, constructed of adobe, was built within the last few years. Its dimensions are: Main barrack room 106 feet 4 inches by 24 feet 3 inches by 12 feet. It is occupied by 34 men. In the ceiling are two small openings into the loft 2 feet by 2 feet 6 inches, at the extremes of the room. At the gables of the wings and main room slatted windows, about 2 feet by 2 feet 6 inches, are the means provided for admission of fresh air to loft. The right L is divided into kitchen and mess room; the left, measuring 59 feet 2 inches by 24 feet 3 inches by 12 feet, is used as squad room and quarters 12 men. The usual small trapdoor in ceiling for ventilation.

Quarters for married soldiers and officers.—For the noncommissioned staff three good frame structures are provided, containing each two bed rooms, living room, kitchen, and small bathroom with hot and cold water.

Two double frame houses, each containing four rooms and kitchen, shelter some of the laundresses. The bed rooms measure 10 feet by 10 feet. They are compactly built and at present are very comfortable. In the rear of the company barracks, between them and the privies, are several old "tumble-down" structures, built of refuse lumber. Fortunately but two of these are occupied at present. Several of a similar nature were torn down at my request, and promise has been made to gradually remove the remainder, thus throwing the laundresses away from the immediate proximity of the barracks. One of these forlorn structures, containing four rooms of varying dimensions, is used by the married soldiers of I Company, Eleventh Infantry. Constant watchfulness is demanded to compel cleanliness on the part of these people.

Guardhouse.—A modern sandstone building, containing cells, prison room, guardroom, and room for noncommissioned officers of the guard. The guardroom measures 32 by 24 by 11 feet, and has no other means of ventilation than the accidental opening of window or door. There are on an average 12 men in this room. The prison room, 21 by 24 by 11 feet is also devoid of ventilation except such as may come from the grated door. The loft is well provided with air coming through spaces between the roof and the side walls at the eaves. A small trapdoor in the hallway is the only means by which this fresh air can enter the rooms.

Officers' quarters.—The officers' quarters number fifteen, of which twelve are frame structures, three just completed of sandstone.

The material for the wooden buildings, obtained largely from neighboring forests, was poorly seasoned, and in consequence of warping and twisting the cottages are far from weather-tight. Through the ceilings of some of the bed rooms the sky is visible. By reason of cracking and badly-jointed timbers, they are very cold in winter, and have always been a subject of complaint. Most of these cottages

contain two to three bed rooms, kitchen, dining room and sitting room. The bath-room has provision for cold water only.

The three new stone structures are, however, exceptions. The two smaller ones, of one story, contain each three bed rooms, sitting room, kitchen, and bathroom (closet attached) provided with hot and cold water. The soil pipes from the closets empty into a common sewer pipe for the three stone buildings, and it throws its contents into the canyon in rear of the quarters. The largest of these stone quarters, intended for the post commander, has two stories, beautiful large rooms, plate glass windows, etc. There are in this house about six bed rooms, dining room, parlor, kitchen, and bathroom with water-closet attached.

The wooden buildings, although roomy, are not properly adapted to this climate, which is noted for its cold nights and extremes of temperature. After snow or during the heavy rains of summer the roofs leak dreadfully, in consequence of the defective workmanship and materials.

Post schools.—The school for children is held in the post library—also utilized as a chapel. It is a roomy well-built frame structure, measuring 60 by 24 by 12 feet. There is no proper provision for ventilation, and when crowded the place becomes extremely oppressive.

Heating and ventilation.—The barracks are heated by the usual barrack wood stove. Those structures of adobe, compared with the weatherboarded, retain the heat much more readily. With the latter the cracks and imperfections in the jointing of the walls permit more or less cold air to enter.

By reference to remarks under buildings it will be seen that no proper provision has been made for constant and systematic ventilation in any of these barracks. In some, slatted windows, allowing a limited volume of air to enter the barrack loft, are inserted in the gable ends. The air is supposed to enter the dormitories through trapdoors in the ceilings, which, unfortunately, are too often closed by the men. Supposing the slats in these crude ventilators to shut out 50 per cent of the air, those having dimensions of 4 feet by 5 feet would permit 10 square feet of air to enter the loft; those 2 feet by 2 feet 6 inches would represent a flow of only 2 feet 6 inches square.

All these barracks need ventilation, and we see in some, such as Nos. 3 and 4, no ventilation of any kind exists excepting in the squad room of No. 4, where a small ridge-pole ventilator has been recently added. The main barrack room of both these buildings, occupied respectively by 39 and 49 men, have no scientific method of aeration whatever, and even if two or more windows were kept constantly open, I doubt if the purpose would be subserved.

No chemical examination of the air in these close barracks has been made, but to one coming from the outer world the atmosphere in these crowded rooms is intolerable. What the ultimate effect may be on the I Company people (Indians), susceptible as they are to crowd poisoning, can be imagined.

In barracks No. 3 we find the same unhygienic state of affairs—no provision for fresh air or exit of foul. Barracks No. 5 (H Company, Eleventh Infantry) is somewhat more favorably placed. Slatted ventilators permit the entrance of fresh air to the loft, and several good-sized trapdoors in the ceiling allow the current to enter the dormitories. Unfortunately there is some difficulty in heating this as all the frame buildings, and in search for warmth the men close these trapdoors, thus neutralizing any good results in the way of oxygenation. No. 7, occupied by D Troop, First Cavalry, is also defective in this respect. At the gables of the main building and wings are small slatted windows 2 feet by 2 feet 6 inches. The current of air circulating through the loft is supposed to enter the rooms through a few small trapdoors (2 feet by 2 feet 6 inches) in the ceiling. Constructed of adobe, this building is readily heated and is also closer than the weatherboarded barracks. The post hospital is the only properly ventilated structure at the post.

Drainage.—By reference to the topographical description of the station, it will be seen that nature has well-provided for drainage, the inclines running towards all points of the compass, and no structure so situated that it can not offer ready means for the escape of surface water. Surface drains, following the inclines, have been dug for all buildings, but unfortunately, through carelessness, are constantly clogged with débris, thus damming and spreading the waste water over the surface of the ground. All the waste water from the barracks, lavatories, post bath house and bakery empties into a narrow ditch running east and west. When I came here the west end of this ditch, as it passes by the hospital inclosure, had become clogged by an extensive growth of weeds and bushes. In consequence the channel was almost obliterated, more or less filth constantly accumulating and decomposing within a few yards of the hospital. The odor was distinct in the hospital wards. Fortunately this is now cleaned out. Waste water from bathrooms and kitchens in the officers' quarters passes into the canyon to the rear of the buildings. The bath water, kitchen refuse and rain water enter a common wooden drain three

inches deep and wide. This covered drain carries the refuse water into the alley, in turn emptying into an open ditch. The open ditch then throws its contents into the canyon. The outlet of the small wooden drain has frequently become obstructed, so that for months at a time the waste water had no apparent exit. In consequence of backward pressure on the wooden channels the narrow strip covering the drain had been forced up sufficiently to allow the liquids to enter the soil. Naturally porous, it had absorbed these discharges for an indefinite period. These obstructed drains were traced with considerable difficulty, cleared, and precautions taken to prevent future clogging. No traps have been placed at any water fixtures in these quarters. Former post surgeons have frequently urged that these wooden drains be opened. As they are now, there is little doubt but that their extent of 50 to 75 feet can permit of the formation and escape of much noxious gas into the houses.

The new stone structures are somewhat more modern,—traps for the protection of the inmates have been provided and the sewage passes into a common sewer pipe discharging into the canyon.

Waste water from the laundresses' quarters passes through surface drains into the dry ravines; as also that from the noncommissioned staff quarters. The surface drains attached to the latter quarters become frequently obstructed, and waste water which would readily flow into the ravine in the rear is permitted to stagnate and saturate the soil.

Disposal of excreta.—Except in the case of some of the officers' quarters the pit system of privies is in vogue here. The company closets are located on the edge of a ravine. When we consider the length of time these privies have been in use here an enormous amount of excrement has been allowed to deposit in the soil. By virtue of the location of these company pits on the slope of a ravine, there is little danger that any dwelling would be erected immediately on the ground. Constant saturation of the soil with human excrement may in the course of time affect the health of the men. Earth-closets are in use at some of the officers' quarters and there seems little difficulty in providing for their police. The excreta from the stone quarters pass into the canyon through a system of sewer pipes. Pit privies are in use at the laundresses' and noncommissioned staff quarters and constant watchfulness is demanded.

Drainage of the valley.—This is important as affecting the health of the command, particularly the condition of the valley above the post. At a distance of half a mile from the post is a marsh embracing about three to four acres. The records show that this has existed for an indefinite period, the post surgeon in 1882 having urged its drainage.

The Indian farms extend a distance of 10 to 12 miles up the east fork of the White River. The necessary water is taken from the river by means of irrigating ditches. These ditches become broken by horses and cattle, and no care having been taken to turn back the water after the season has ended, it passes through the numerous breaks in the banks, saturating the soil and rendering it quaggy. The emanations from this wet soil are certainly not condusive to health and undoubtedly affect those living in the valley. All the conditions are favorable to the development of malarial miasm. The frequent morning dews, fogs, frosts, and perceptible sense of dampness at night indicate the presence of moisture, and I am told this has increased in direct ratio to the increased irrigation.

Food and clothing.—As far as the food is concerned little can be said. The men have an abundance of good beef and vegetables, and although there is little variety the ration is substantial, and as a rule well cooked.

Habits and morals.—Nothing in the habits or morals of the men would explain the heavy sickness here. A few cases of alcoholism and venereal disease present themselves, but I do not think the proportion unusual.

Water supply.—The water supply here has long been a subject of complaint, controversy and anxiety. Assistant Surgeon Raymond in 1882, referred to the possible contamination in the future by farms above the post, and his prediction has certainly been verified fully, as the many reports from succeeding post surgeons have proven.

In my monthly sanitary reports I have endeavored to explain the situation as clearly as possible, but a further reference may not be amiss in this report. Since the establishment of the post the water has been derived from the river, first carried by water wagons and then a pump substituted. Prior to the establishment of extensive farms above the post a purer or more inviting looking water could not be imagined. In 1889 these farms extended a distance of only 3 miles above us, but gradually increasing in number and area have reached an extent of from 10 to 12 miles. In 1889 Capt. McMurray, of the First Artillery, was sent here as a special inspector to propose some plan for the betterment of the post water supply. Thne the farms reached but 3 miles up the east fork, and by drawing the water above these farms it could be obtained in its original purity. It was, therefore, at that time a plausible solution of the vexed problem, and the inspecting officer recom-

mended its adoption. But with the usual slowness where the hygiene of a post is concerned, this plan has just been carried out.

But now, unfortunately, conditions are changed. As far as the quantity of water goes nothing could be desired, but as the completion of this flume has merely eliminated a fractional part of the danger, the water is not pure. The flume is an ingenious and well-constructed affair, originating a distance of 3 to 3½ miles above the post at the site of the Indian mill and workshops. It flows tortuously at the base of the foothills south of the river and strikes the post reservoir on the east side. The water pollution is produced in this way: (1) When the farming season is passed and crops garnered horses and cattle are permitted to feed on the deserted lands, from which they derive considerable nourishment in the way of husks and other remnants of the corn crops. Their constant presence on the land insures an accumulation of manure, which is also increased on some farms by artificial fertilization. (2) The presence of large quantities of water on these bottom lands from neglected and broken ditches favors the decomposition of this animal and an abundance of vegetable débris. When the dry season begins the water is permitted to overflow these fields in large volumes and the surplus reëntering the river carries with it this dissolved and suspended organic matter. During the last season particles of débris were visible to the naked eye in the water, and if permitted to stand for a few hours a repulsive odor of decomposition was perceptible. The reservoir, after receiving its supply through the flume for about one month, was recently cleaned. The mud and débris on the bottom were fully 6 inches deep, and the smell far from pleasant. The current in the flume is rapid, so that it will not permit the precipitation of mud, organic material, or silt. As the river is at many points inaccessible on account of brush and wire fences, what is more natural than that stock should seek this exposed ditch for water? That this is true is proven by the constant breaks in the banks and the thousands of footprints along its course.

A recent promoter of this scheme conceived the idea of supplying the necessary power to the post sawmill through the medium of this water, and in the fascination of this ingenious proposition, seemed to lose sight of its original purpose, the furnishing of pure drinking water.

Another objection to the ditch is the danger of freezing, clogging, and thus breaking its banks and shutting off the supply. This accident has occurred twice already this winter (an unusually mild one), the only resource being to clear its entire course—a by no means an easy task—and the result was a copious supply of water so muddy as to be almost opaque. The problem is difficult of solution.

As suggested in my sanitary reports, a good deep well would appear the only hope, but owing to extensive substrata of lava it seems doubtful whether a well could be sunk in the immediate vicinity of the post. Extensive boring would alone answer the question, but under the circumstances, I believe the procedure warrantable whatever the cost. I am informed that the flume recently completed cost the Government $1,000 and probably called for much soldier labor. As before stated, at the time when this ditch was conceived the idea was excellent, but conditions have changed greatly by the decided multiplication in acreage of the farms.

Prevailing diseases.—The records show that the large disability at this post has resulted from (1) rheumatism, (2) affections of the digestive tract, (3) malarial diseases, (4) diseases of the respiratory system.

Rheumatism: From what I have observed and can glean from the records, the predominating types are (1) subacute articular, (2) chronic articular, (3) muscular. Instances of the acute type with high fever, great prostration, etc., are in the minority. The records, however, show many cases of acute rheumatism, which, from their brief stay in the hospital, were undoubtedly of the subacute form—cases, for example, retained but three to five days, which would have been impossible in typical cases of inflammatory rheumatism.

Although some etiological factors which have escaped my notice may be active in the production of rheumatic affections, I think that we have pointed to local hygienic defects which would be indirectly concerned: (1) Total absence of ventilation in some of the barracks and defective aëration in others, conditions bearing upon the origin of these affections. The constant presence of breath-polluted atmosphere in these barracks interferes with the natural elimination from the skin and lungs, and places the system in a condition rendering the man more susceptible to rheumatic affections. (2) The large increase in farm land in the valley creating increased humidity. (3) The marked variations in temperature between day and night. (4) Some of the barracks (weather-boarded), owing to structural defects, are warmed with the utmost difficulty, and the temperature can not be constantly warm or uniform.

Malarial diseases: The most common malarial manifestation here is either the intermittent or remittent type of fever. In spite of the most salubrious surroundings these fevers will appear in all parts of Arizona; but certain local conditions favor-

able to the increase and spread of malarial miasma have been emphasized: (1) The marshy land above the post and the saturated soil of the Indian farms form congenial hotbeds for the birth of the poison. (2) When the wind blows from the east it sweeps directly over the post and can carry with it seeds of infection. (3) The drinking water, polluted by passage over the farms, can introduce into the system the germs of the disease, or at least place it in a favorable condition for its development.

Like most instances of mountain fever met with in the southwest, the fevers here do not yield to quinine. The treatment adopted, I believe, by most practitioners, is expectant and stimulating; antipyretics to reduce extremely high temperature; quinine in tonic doses, arsenic and alcohol *pro re nata*.

Diseases of the digestive tract: Diseases of the gastro-intestinal system play no unimportant part in the sick list here. Affections of this post are: (1) simple intestinal colic; (2) cholera morbus; (3) simple diarrhea without tormina; (4) diarrhea with sanguineous passages, etc.; (5) acute dysentery; (6) chronic dysentery.

These diseases are so frequent during the warm season that the majority of the garrison use boiled water. There is little doubt but that the drinking water more than any other factor has been responsible for so much of this sickness. The causes of water pollution and the description of the supply have been touched upon in the discussion of water previously. During the winter season the percentage of sick from these causes is relatively small.

There certainly is nothing in the clothing or food of the men that could explain the prevalence of these diseases.

Diseases of the respiratory system: It is evident that many conditions here are favorable for the production and prolongation of these diseases: (1) acute bronchitis; (2) subacute bronchitis, with mucous râles and more or less cough and soreness of the chest; (3) tonsillitis; (4) chronic follicular pharyngitis, and an acute congestive variety.

Again we would be justified in suggesting defective ventilation as an etiological factor in the production of predisposition to these affections. Certain it is that from my own observation patients returned to duty apparently cured, quickly relapse, and I have concluded that detention in the hospital until all signs of disease have long since disappeared is wise economy.

The moisture evaporated during the heat of the day is rapidly condensed as night approaches, making the valley decidedly damp and uncomfortable. This is one of the few stations in the southwest where morning mists and heavy frosts are met with. The marked extremes between the day and night temperature, varying from 30° to 50°, should in the presence of moisture play an important part in the production of pulmonary or rheumatic affections. Quite a number of cases of tonsillitis along the officers' line were observed last June, which from what I learned were suspiciously diphtheritic in history and appearance. I have no doubt now but that the accumulation of waste water in the yards was the promoting cause.

General conclusions and recommendations.—It will be seen from the description of the various hygienic defects upon which I have touched that many former post surgeons here had noticed these conditions and made persistent appeals to the post commanders in the monthly sanitary reports for their removal. It is therefore a matter of interest to discover that predictions as to the possible effect of the unhygienic conditions have been largely verified and that the suggestions were not made by the medical officers without forethought and intelligence. That their recommendations for the removal of sanitary perils have been ignored the sanitary reports will show; and as many of these suggestions could have been carried out with little expense, it makes the neglect all the more censurable. From what I can learn, it is my belief that the poor police of this post for the past few years has had much to do with the sickness. It required some time after my arrival here to learn the true state of things, but when told that pit privies, filled to the seats, drains clogged and ill-smelling, old deserted buildings, receptacles for the accumulation of filth, and other conditions too numerous to mention, had been a menace to the health of the post for an indefinite time, I was forced to the conclusion that bad police was one factor in filling the hospital. It has always been my aim, in submitting recommendations as to the hygiene of the post, to propose some plan of procedure within the powers of the post commander to carry out, and that would involve as little expense as possible. However, there is a limit to this method of action, and when the loss to the Government in sick and disabled is considered, as at this post, money spent in the amelioration of sanitary conditions would be wise economy. It is with a full consciousness of the importance of the subject that I submit the following recommendations. I am informed that the post quartermaster has been directed to submit estimates for a sewerage system; until such a system can be completed I would suggest that all surface drains be deepened, straightened, and well paved with flat stones. This would involve considerable labor on the part of the command, but would be comparatively inexpensive; I would suggest that all the closed wooden drains, carefully described in connection with the officers' quarters, be

opened and well-paved surface drains be substituted; that the pit-privy system be abandoned and movable earth closets be substituted at all buildings; that stringent measures be adopted to insure regular flushing of surface drains.

With reference to the buildings, I would advise that the troops be quartered in adobe structures entirely; that the barracks now in use as a "post exchange" be used to shelter one of the companies now occupying weatherboarded barracks; that an aditional set of adobe barracks be constructed, thus providing adequate shelter for four companies, and that the old weatherboarded barracks be abandoned as quarters for troops; that proper ventilation be provided for all the barracks by means of ridge-pole ventilation in connection with under-floor channels; that the wooden quarters now occupied by the officers be gradually replaced by adobe or stone buildings.

As to the water supply, sufficient has been said to indicate what measures I consider expedient; prospecting by boring until an underground flow sufficient to insure a good well is found; that the supply main be increased from 3 to 5 inches, and that the present system of supply be abandoned as dangerous and uncertain.

To remedy the defects in the valley, to which I have invited attention as productive of moisture, I would suggest that the Indian farmers be required to turn back the water passing through the irrigating ditches into the river as soon as the season has passed, and that the old marsh immediately above the post be drained by abundant surface or tile drains.

Until these various measures are carried out it is my opinion that little can be expected in the way of lessening the sick report at this post.

Remarks of post commander.—There is no doubt whatever but what such unhealthiness as exists at this post is due mainly to lack of a proper sewerage system, and to the impurities that get into the water, which is otherwise pure.

I consider the impurities in the water to be the chief cause. The water now runs through open ditches either to the pump well or direct to the reservoir. In either case roaming cattle, ponies, Indian dogs, etc., trample and wallow in the ditches, which are from 1,000 feet to 4 miles long. I think if piping (iron or tiles) were used to carry the water to the pump house and a filter well or cistern placed there, the difference in the quality of the water would be greatly improved at a slight expense. As to sewerage, few posts are better or as well adapted for an excellent sewerage system as this one, and that, too, at a comparatively small cost.

Every set of officers' quarters and barracks here should be at once provided with both hot and cold water, as they now are with cold water alone, and good water-closets, such as are now in the new sets of officers' quarters.

Remarks of medical director.—After a careful reading and study of the several sanitary reports received at this office since the beginning of my tour of duty in this department, as well as of correspondence relating to the health of Fort Apache, I am convinced that the unsatisfactory condition of health at this post is mainly due to a polluted water supply, though the other factors alluded to by Dr. Jarvis have undoubtedly had their full weight, and that, if it is intended to continue this post, it will be imperative to introduce a supply of pure water either by artesian boring or by a line of iron piping, which will take the water from above any possible source of pollution. Concurrent with the water supply a well-arranged and scientific system of sewerage is needed.

THE PREVALENCE OF SPECIAL DISEASES.

SPECIFIC FEBRILE AND ACUTE INFECTIOUS DISEASES.

The specific febrile and acute infectious diseases, including under this heading erysipelas, tonsillitis, and cases reported as typho-malarial, gave an admission rate of 141.85, a nonefficient rate of 4.09, and a death rate of 0.86. Of the admission rate 74.08 represents the prevalence of influenza and 41.90 that of tonsillitis; measles, mumps and enteric fever form the mass of the remaining cases, as noted below.

Cerebro-spinal fever.—Two cases were reported among enlisted men, one at Fort Wayne, Mich., the other at Fort Leavenworth Military Prison. One recovered, but the man had to be discharged on account of resulting mental vacuity; the other died, and the diagnosis was confirmed by the appearances discovered post mortem.

Chicken pox.—Thirteen cases were reported from nine different posts; at none of which was small pox present.

Cholera.—In anticipation of an invasion by this disease on account of its prevalence at some of the European ports largely concerned in

the shipment of immigrants to this country, medical directors and post surgeons were duly reminded of the precautions requisite for the protection of our military stations. The following circular was issued by Surgeon-General Sutherland:

This circular is published for the information and guidance of medical officers who may be unfamiliar with the general management and prevention of cholera, and for others who have received no specific instructions from medical directors of the Army.

As this disease by its presence at the New York quarantine now threatens the whole country, a great object will be gained if we succeed in preventing it from appearing at our military posts by thorough and effective sanitation and cleanliness.

Science and experience have demonstrated that cholera is caused by a specific germ which must reach the bowels in a living state; that this germ maintains its vitality and harmful properties under many conditions, the most important being in the discharges from the bowels of the sick, in their soiled clothing and bedding, in the privies and cesspools which receive the discharges, and in the soil and subsoil waters which become secondarily contaminated.

Guided by these principles, we may determine what is to be done, first, in anticipation of an invasion, and, second, when the invasion has taken place.

First. As cholera germs can live and multiply for a time outside the body in the presence of decayed organic matter, particularly that of animal origin, all conditions favorable to their existence should be excluded. The measures necessary to accomplish this are to remove all decaying matters from a post, whether found in dwellings, cellars, barracks, stables, dunghills, old wells or cesspools, coalbins, or other hiding places, and to require absolute cleanliness of all persons. These are general, but particular instructions should be given for the inspection, condemnation, and destruction of all tainted meat, fish, unsound vegetables, fruit, or any other article of food that would tend to cause diarrhea.

If cholera be in the vicinity of a post, a thorough and efficient quarantine should be kept up against the infected locality. No person should be admitted within the lines without undergoing quarantine examination; no baggage nor supplies without being disinfected or passed by the medical officer. Police regulations should be scrupulously carried out. The troops should be preserved from all antihygienic influences. There should be no unnecessary exposure to sun, rain, or night air, and no drills nor fatigue duties other than to furnish occupation and needful exercise. When the military conditions permit, the post should be viewed as engaged in an active campaign against an insidious and implacable enemy, and the attention of every officer should be devoted to superintending the conduct of his men, with special reference to this view.

Articles of leather, such as trunks, boots and shoes, suspected of cholera infection, should either be destroyed or washed with disinfecting solution. Attention has been called to the influence of old shoes as a means of propagating the disease; when a person treads a soil more or less damp in an infected locality there is every chance of his conveying the germs of the disease.

A quiescent state of mind should be enjoined upon all; nothing is more calculated to spread the disease than unusual excitement or the depressing influences of fear and fatigue.

The use of acid drinks, if cholera is threatening, should be prescribed. This is for the purpose of acidifying the stomach and its contents, which are always alkaline except when digestion is in progress. Acids are antagonistic, alkalies favorable, to the development of bacteria. If the stomach be kept reasonably acid by pure dilute acids all bacteria will be destroyed before reaching the intestines, which are always alkaline in health. Diluted or aromatic sulphuric acid, acetic acid or good vinegar, lemon or lime juice, are suitable agents to employ. Hydrochloric acid is also useful. This acid is always more freely secreted when the gastric membrane is stimulated by the presence of salt; hence salt meat is an excellent article of diet during the prevalence of cholera.

Moreover, all arrangements should be made for the isolation and treatment of a first and succeeding cases should they unfortunately occur.

Second. When a case of cholera appears it should be promptly isolated and all unnecessary contact with outside people be prevented. The patient or patients should have a nurse to wait upon them exclusively. When cases occur in quarters other than barracks they should be isolated in the special cholera hospital; but if treated in quarters all absorbent articles of furniture, such as carpets, cushioned articles and hangings, should be immediately removed from the apartment.

All cases of premonitory diarrhea should be detected by careful inspection and treated immediately; and full instructions should be given regarding food, drink, and the disinfection of excreta.

With the exceptions of fruits that are protected by an outer rind no article of food should be eaten that has not been subjected to a boiling heat in its preparation

for the table; and all vessels used for the cooking, serving, or storage of food should be soaked in boiling water prior to being used.

All water for potable use should be boiled before use, if not received directly from a condenser; and it is well to acidify it as before stated.

As the infection resides in the stools, all discharges should be received into a vessel containing a disinfectant; soiled bed linen and clothing should be steeped in a solution of corrosive sublimate or chloride of lime before being removed from the ward or sick chamber. The floor and furniture when tainted in any way should be immediately washed with one of the solutions mentioned; the person of the patient sponged when necessary with a dilution of chlorinated soda; and the ward or sick room, as in all infectious diseases, should be freely ventilated.

As the disease is propagated chiefly by the introduction of its infection in connection with food or drink, care should be exercised by attendants and others in purifying the hands after contact with infected articles, particularly before eating; and obviously no food or drink should be used in the ward or room save by the cholera patients.

Boiling in water may be relied upon to purify articles of body clothing and bed linen that have been infected by the discharges from the bowels. All infected articles must of course be kept separate from the general wash. Solutions of corrosive sublimate, 1 drachm to the gallon of water, chlorinated lime, 1 ounce to the gallon, solution of chlorinated soda diluted with nine volumes of water, and carbolic acid in a 2 per cent solution, are efficient disinfectants. They may be used for soaking soiled linen before sending it to the laundry, and for washing the floors, woodwork, and walls of the room. They may also be used for the hands, and, with the exception of the sublimate solution, for general personal use. Stronger solutions of these disinfectants or of sulphate of iron should be employed for the treatment of excreta or for saturating the sheets in which a dead body is enveloped pending arrangements for burial. A suitable strength is obtained by dissolving 2 drachms of corrosive sublimate or 4 ounces of chlorinated lime in a gallon of water, or by making a 5 per cent solution of carbolic acid. Any of these should be added in volume equal to that of the material to be disinfected. The disinfectant should be permitted to act on excreta for an hour, after which the contents of the vessel may be disposed of, preferably by burial. As contact with metals decomposes the sublimate solution, it should be used only in earthenware or other suitable vessels.

Privy vaults or cesspools that have become infected by the addition of discharges direct from a patient, must be treated liberally with chlorinated lime, sulphate of iron, or strong solutions of sublimate or carbolic acid.

A dry or oven heat of 230° F., continued for two hours, or an exposure to superheated steam, 25 pounds pressure, for one hour, is useful for dealing with infected garments.

Temporary treatment until a medical officer is called in should consist of applications of mustard on the abdomen with warmth to the body and feet, and hot brandy punch in small and repeated doses, the diet to consist of well-boiled rice and milk; and if the discharges continue, laudanum, thirty drops, should be given two or three times with the brandy. The medicine recommended and generally used in India is a mild carminative consisting of one part of opium, two of asafetida, and three of black pepper, made into 5-grain pills, which is said when taken early to have checked the disease in thousands of cases.

If the post becomes thoroughly infected, security can be obtained only by abandoning the dangerous locality. Troops that have fallen back before the advance of the disease have often escaped seizure, or escaped further disease if withdrawn subsequent to the time of their attack. A temporary abandonment of the infected locality is therefore recommended if there is ground available for occupancy.

Fortunately, however, the imminence of the danger subsided by the gradual extinction of the disease at the quarantine of the port of New York, and it became evident that several months would probably elapse before similar threatening conditions would recur. Influenced by the circular from this office medical directors on the return of warm weather again notified their subordinates of the importance of giving special attention to local sanitary conditions. The following, issued by Lieut. Col. D. Bache, Medical Director, Department of the Platte, illustrates the action taken by post surgeons.

In view of the importance of an early renewal of activity in the sanitary preparation of posts for the coming summer your attention is called to the value of the inspections made under Paragraph 1642, Army Regulations, and to the direct advisory responsibility which is there placed upon the medical officer. This responsibility is not discharged by a single formal inspection and monthly report, but may

require a repeated representation of sanitary defects and remedies. This vigilance is not wasted even when not confronted by some epidemic emergency, for the statistics of a post may be expected to show the diminution of all serious disease ratios in direct response to a thoughtful and sustained effort in sanitary improvement.

Dengue.—The only posts from which this fever was reported were Forts McIntosh and Sam Houston, Tex., where 43 and 21 cases, respectively, were said to have occurred.

Diphtheria.—Eleven cases were reported among enlisted men, 6 at Fort Grant, Ariz., and 1 at each of five other posts. This disease appeared among the children at certain posts. At Forts Hancock, Tex., and Stanton, N. Mex., 1 case each; at Fort DuChesne, Utah, 4—1 fatal; at Fort Yates, N. Dak., 8—1 fatal; and at West Point, N. Y., 9—5 fatal. Eight of the cases at the last-mentioned post, and all of the fatal ones, occurred in the family of Mr. F. P. Baily, quartermaster's employé. In all these instances isolation and disinfection were carefully employed to limit the spread of the disease. The house occupied by Mr. Baily was destroyed by fire together with two tents and some articles of equipage belonging to the Quartermaster's Department that had been used in connection with the treatment of the cases.

FORT YATES, N. DAK.—*Lieut. E. L. Swift.* The disease seems to have been brought into the post by a visitor (a woman) who contracted it while traveling to the post. This person stopped to take lunch at a way station where there was a child sick with sore throat. Three or four days after this this initial case broke out, followed by two other cases (children) in the same house. These latter two children, after running through the course of the disease and recovering, had a relapse of the membranous exudation. Nearly all of the cases have been marked by extensive exudation, and one malignant case occurred in a child 5 years old. The latter was the only death. One child had abscess of right cervical glands, and one had paresis of external recti, soft palate, right arm, muscles at back of shoulder and those of both legs. The former has recovered from the abscess (after opening) and the latter is slowly recovering from the paresis. One child, 13 years old, had marked cardiac weakness for ten days after convalescence. The febrile movement varied in different cases and was quite high in the adults. The latter class of cases was of a mild form, a high fever, lasting two days, and then rapid peeling of exudation and convalescence.

The most complete isolation has been resorted to wherever the disease existed and the post school closed. Hospital Corps nurses were not allowed to go among the other men. Sulphur fumigation of houses, thorough cleaning and rekalsomining were resorted to under direction of a medical officer. Mattresses, pillows and comforters were destroyed by fire; articles of clothing disinfected with sublimate or chloride of lime solutions or destroyed by fire. Every unnecessary article was removed from sick room. The treatment consisted of whisky and digitalis when required, of lime-water spray in sick room, of the most thorough circulation of fresh air through sick room, of half hourly spraying of throat with peroxide of hydrogen. In some cases where there was much pharyngeal mucus, a chlorate of potash gargle every hour was ordered. In a case where the membrane extended to nasal cavity, that was syringed out with peroxide every half hour.

The results were satisfactory in most cases. Peroxide seems to have a marked influence in controlling the spread of the exudation; in one case where it was not at first resorted to the membrane spread with great rapidity and filled the nasal cavity. This latter case was, with the exception of the malignant case, the severest one we had, and was followed by the paretic sequelæ. In the malignant case very little was done, as the child struggled and fought with fury at any interference. It completely exhausted itself by its furious exertion after each dose of medicine, so treatment had to be discontinued.

Enteric fever.—Of this fever, including cases reported as typho-malarial, 151 cases occurred among the enlisted men of the Army, 149 (of which 13 were fatal) among the white and 2 (1 fatal) among the colored troops. A relative insusceptibility to this disease might be suggested by these figures but for the fact that the average annual rates of admission for the past ten years have been 4.34 for the colored as compared with 7.58 for the white troops. Gleanings from larger fields might therefore show a greater equalization of the rates.

The 151 cases were distributed among forty-seven posts. The largest number, 23, was reported from Fort Reno, Okla., but Madison Barracks, N. Y., had 19, Fort Leavenworth, Kans., 12, San Carlos, Ariz., 10, Fort Yates, N. Dak., 8, Fort Monroe, Va., 6, and Fort Sherman, Idaho, 5; four posts had 4 each, four 3 each, eight 2 each, and twenty-four 1 each. The fatal cases were scattered at various posts, one each, except at Fort Sill, where two of three cases were fatal.

Capt. Gorgas, on duty at Fort Reno, attributed most of the cases that occurred at his post to the use of a polluted well water. The well had been condemned by several of his predecessors, and urgent calls had been made by them and their superiors in the Medical Department for the introduction of Caddo Spring water to the exclusion of the well and river waters generally used. Several wells had already been closed and the use of this, the last of them, was prohibited by the commanding officer on receipt of Capt. Gorgas's report. It can not be said, however, that the true nature of these febrile cases at Fort Reno has been made out satisfactorily, as there was but one death and no record of post-mortem examination was furnished. Some of them were probably cases of adynamic remittent. Reference is made in this connection to the report of Capt. J. C. Merrill, submitted below (p. 59). Capt. Gorgas's report is as follows:

I have investigated 29 cases of typhoid fever that have occurred at this post since January 1, 1890, these being all that I could get any information about, either from the records or from personal questioning. Of these, 26 occurred among the enlisted men, 2 in the families of enlisted men, and 1 in the family of an officer.

The disease seems to have been fairly equally distributed among the organizations of the post, B, Fifth Cavalry, having had 7; C, 4; E, 4; G, 2; K, 5, and the band 1; G, Tenth Infantry, 1, and G, Thirteenth Infantry, 2.

As to length of time continuously at post before attack, 13 had been at post for twenty days or more, in 10 no information could be obtained on this point, and 3 had been at the post less than twenty days. Of the 3 less than twenty days 1 had been in from the field twelve days, 1 was taken sick in field after a service of several weeks, and 1 was seventeen days out from St. Louis. This is probably a fair average, and indicates that about four-fifths of the cases are due to local causes about the post, and one-fifth were contracted elsewhere.

The principal source of drinking water for the enlisted men during the summer is from a well in the southwest corner of the post, this water being clear, palatable, and cool. Some water is used from the supply piped about the post from the river. This applies more particularly to the past and to the summer season. At present water is supplied from Caddo Springs for drinking purposes, and all the men questioned agree in saying that this Caddo water is drunk almost exclusively.

As to the water supply of the typhoid fever cases, 26 of the 29 cases occurred among that class of the population, the enlisted men, which drank almost entirely well water. The 2 cases in the families of enlisted men, a young girl about 19 and a boy of 12, both drank well water frequently. The girl tells me that she often drank well water when away from home, though at home they generally used Caddo water. The boy habitually drank well water while playing and exercising about the post. The case in the officer's family was that of a boy 18 or 19. The family were careful to drink none but Caddo water, but the young man hunted a great deal, and no doubt drank a great deal of bad water on these expeditions, and while in the post probably drank well water, as was usual on target range, baseball grounds, etc. I have not been able to question him personally on this subject.

In the town of El Reno, 6 miles off, which is supplied by local wells, there seems to have been very little typhoid fever. The two leading physicians tell me that they have not seen a case in the past year in the town, and only 2 cases in the surrounding country.

I think from this not very complete analysis of the cases that it is a fair presumption that most of the cases were contracted at the post, and that from its being so generally disseminated it is not due to infection of any building or locality.

Looking at the water supply, no reasonable suspicion can rest upon the Caddo water. That class of the population, officers' families, which drank this water exclusively, escaped entirely, and that class which drank little or none, enlisted men, suffered most.

The river water, though not so free from suspicion as the Caddo water, I do not believe to be the source of infection. The class which probably drank river water most, families of enlisted men, did not suffer most, and the 3 cases occurring in this class can as well be attributed to other sources. Officers and their families drank no river water, and the enlisted men very little. Nor could we expect a considerable stream flowing through an uninhabited country to become contaminated with the typhoid germ.

The only remaining source of supply is the well in the southwest corner of the post. Eight-ninths of the cases investigated were from the class of the population which drank water principally from this well. In round numbers, 350 used this well principally, and 200, other water most of the time. Twenty-six of the cases investigated were from the 350 well users, 3 from the 200 of the other class. Two of these three drank frequently well water, though it was not their principal source of drinking water. It is but fair to state that there is considerable prejudice in the post in favor of this well. The water is clear, cool, and palatable. Many of the men have used it for several years with no bad effects, and one family of eight have always used it exclusively without any trouble.

Madison Barracks, N. Y., garrisoned by six companies of infantry, is on the shore of Black River Bay, immediately above the town of Sackets Harbor, N. Y., about 3 miles from Lake Ontario. The bay is about a mile broad opposite the post, and on the river above this situation are a number of sawmills and pulp mills, and the towns of Watertown, with 15,000 population; Carthage, 4,000; Dexter, 1,500; Black River, Brownsville, and other small settlements.

At the time of its invasion by typhoid fever the barracks were rather crowded and the plumbing and sewers in bad condition. The latter emptied into the bay a short distance above the intake of the water supply, and at the time, as a measure of sanitary precaution, the extension of the intake further into the bay was under consideration. An improved sewerage system was also in progress with an outfall, along with the main from Sackets Harbor, into the mouth of Mill Creek, a short distance above the present outfall. A sporadic case of typhoid fever had been occasionally recorded in the medical history of the post, but in no instance until the late outbreak had there been any spread of the disease.

The first case occurred in the person of a recruit, who was suffering from fever on his arrival, September 18, from Binghamton, N. Y., where he had been enlisted. The second was developed a month later, October 18, and from this time until December 13, when the last case occurred, there were 25 more cases, making 27 in all—1 officer, 20 enlisted men,* 1 female servant, and 5 children. Two of the cases proved fatal.

From a careful consideration of the attending circumstances it is probable that the spread of the disease was due to infection from the first case, discharged through the sewers into the bay from which the water supply was derived. The cases were scattered over the post, so that defective ventilation or other insanitary conditions of certain buildings, the milk supply from various sources, and transmission by personal contact, were readily eliminated from the list of possible causes. The restrictive measures adopted were isolation in quarters or removal to hospital, disinfection of soiled linen before washing, and of discharges before consigning them to the sewers, and the disuse of the suspected water supply. The drinking water was boiled before being used until a new supply was obtained from Henderson Bay and a well so situated as to be free from contamination by surface drainage.

*These figures do not agree with the statistics as given above and in the tables in the appendix, because they represent the facts at the date of the report, while the tabulated statistics include only the cases completed during the calendar year 1892.

Two hospital tents were floored and framed to extend the hospital accommodations of the post.

The improved sanitary condition of our military posts has rendered such local epidemics of rare occurrence. Formerly they were not uncommon, more or less associated with remittent fevers, and constituting what were then called typho-malarial fevers; but their development has latterly been suppressed by sewerage and water supply. With an efficient sewerage system and an adequate supply of wholesome water it is safe to say that Madison Barracks would have had no local spread from the introduction of a case of typhoid fever.

The report of Lieut. Col. Sternberg on this outbreak is herewith submitted:

The distribution of the cases in various parts of the garrison shows that they bear no immediate relation to each other as regards infection, but that all must have contracted the disease from a common source of infection. The only apparent common source of infection is the water supply. The facts shortly to be referred to fully justify the opinion that this outbreak is due to contamination of the water supply of the post with the excreta of typhoid cases.

A careful inquiry with reference to the milk supply shows that the different companies of the garrison obtain milk from three different sources, and there is no evidence that any cases of typhoid fever have occurred in the families of those who supply the milk or among the families of some of the officers of the garrison who have used it freely. B, C, F and G companies obtain milk from a man (Leffer) living 500 yards from the Government reservation. B company has had 4 cases of typhoid fever, C company 4 cases, F company a single case, and G company 4 cases. E company, which obtains milk from another source, has had 2 cases, and D company, which obtains milk from Mr. Lansdale, a farmer living 2 miles in the country, has had 3 cases.

Again, I am unable to ascribe the outbreak to defects in the system of sewers at the post, although this has not heretofore been satisfactory and is now being improved; for the construction of the barracks and the arrangement of the water closets and sewer connections are such that sewer gas can not very well find its way to the dormitories of the men, and some of the cases have occurred at a distance from any sewer connection, *e. g.*, case No. 8, which occurred at the quartermaster's stable.

The present water supply of the post is obtained from Black River Bay by an intake well, located about 30 feet from the shore and about 500 feet from the point where the sewer from the post hospital discharges into the bay. This supply has been in use since 1882. In view of the fact that the first case during the present outbreak was an imported one—a recruit who had only been three days at the post when taken sick—that the excreta of this man were thrown into the hospital water closet and must have been discharged into the bay through the old drain (since closed), and that the outbreak among those using the water thus liable to contamination occurred after an interval of twenty-two days and has continued up to the present time, it seems to me extremely probable that this epidemic is due to contamination of the water supply by typhoid bacilli which developed in the hospital sewer or in the water of the bay from germs contained in the excreta of case No. 1.

I am informed by Assistant Surgeon Merriwether, U. S. Army, who was acting post surgeon at the time this first case occurred, that he directed the disinfection of all excreta from this case as soon as the diagnosis was made. But it is hardly probable that this measure was carried out so promptly as to make it certain that no living typhoid bacilli escaped into the hospital sewer. While the explanation offered appears to me to be the most probable one, it is also possible that the epidemic resulted from contamination of the water of Black River Bay and the water supply of the post by typhoid bacilli contained in the sewage of towns located upon Black River, a stream of considerable size, which empties into the bay. The sewage of Watertown, a town of 15,000 inhabitants, and of several smaller places, is discharged into the Black River. Watertown is about 10 miles distant from Madison Barracks.

There has been no considerable epidemic of typhoid fever at Watertown, but I am informed that cases of the disease occurred there during the months of September and October. I am informed by Dr. Lord, of Sackets Harbor, that there has been no prevalence of typhoid fever in that town this year, and that the inhabitants of the town do not use the water of the Black River Bay for drinking purposes, but obtain their supply from wells. Dr. Lord also informs me that he has had cases of typhoid fever this fall in families living on the other side of Black River Bay, opposite Madi-

son Barracks, and that these families use the water of the bay for drinking purposes. After careful consideration of all the facts I am convinced that, while the new intake well, not yet in use, presents less danger than the old one, it is unsafe to use water from this locality or from any part of Black River Bay for drinking purposes. The same objection does not exist against the water of Henderson Bay, which is a portion of the lake into which no stream of water empties and upon the shores of which there are no towns or factories to pollute the water. I visited the shores of this bay in company with Maj. Caldwell, post surgeon, and Capt. Thompson, assistant quartermaster, and am convinced that this is the nearest practicable point for obtaining a satisfactory water supply for Madison Barracks.

According to an indorsement by Assistant Surgeon Merriwether on a communication to the Surgeon-General from W. M. Mew, chemist, (dated Surgeon-General's Office, Washington, September 23, 1892), "immediately you cross the bar between Horse Island and the main land into Henderson Bay you get into clear water. The approximate distance from the pump-house to the shore by way of Ogden and Ambrose streets, thence 1,000 feet northwest is 10,100 feet." At this point, I am informed by Capt. Thompson, assistant quartermaster, there is a depth of water of about 32 feet. The report of Dr. Wm. M. Mew, chemist, attached to the communication above referred to, shows that the water of Henderson Bay is unobjectionable so far as a chemical analysis can determine the matter. The same is true of the water of Black River Bay obtained from the vicinity of the new intake well. But it would be extremely unsafe to rely upon a chemical analysis, upon supposed currents or prevailing winds, in view of the fact stated by Dr. Merriweather in his indorsement above referred to. "As I stated in a former communication, the crib proposed is 450 feet from the shore, and is directly in position to receive the sewage from the post flowing outward into the lake."

While making my inspection at Madison Barracks I obtained samples of water from the present supply, and have commenced a bacteriological examination, the results of which will be embodied in a subsequent report. But I may say in advance that a negative result, so far as the presence of the typhoid bacillus or other pathogenic bacteria is concerned, will in no way change my opinion as to the danger of habitually using water from this source for drinking purposes.

The occurrence of an epidemic of typhoid fever or cholera at Watertown under such circumstances might be disastrous to the garrison of Madison Barracks. That the present epidemic has not been more extensive and fatal in its results is no doubt due to the prompt measures taken by the post commander, under the advice of the post surgeon, for preventing the use of the contaminated water of the bay and improving the general sanitary condition of the post. Early in the epidemic the recommendation was made that the water should be boiled before it was used for drinking purposes, and facilities were provided for storing boiled water in convenient localities at the company barracks. But as the unboiled water was easily obtainable, it is probable that the enlisted men of the garrison not infrequently made use of this, notwithstanding the orders to the contrary. Recently water for drinking purposes has been procured from a well located at some distance from the post on high ground, and with surroundings which seem to preclude the possibility of contamination by surface drainage.

The comparative immunity of the officers of the garrison and the members of their families is perhaps due to greater care with reference to the use of boiled water and the better sanitary surroundings.

The enlisted men on duty at the time of my inspection generally presented a healthy appearance, and were evidently well fed and well cared for, so far as was within the power of their officers. But the barracks in which they are quartered are overcrowded and do not comply with modern sanitary requirements. The number of men in each company barrack, and the cubic air space for each, is shown in the following table:

Company.	Number of men.	Cubic air space.
		Cubic feet.
B	36	585
C	41	606
D	37	627
E	35	568
F	42	621
G	38	624

The dormitories are in the second story of the barrack buildings. They are provided with ridge ventilators, which, if always open, and with a proper inlet below by way of the stairway and open windows in the first story, would probably secure

a sufficient supply of fresh air. But during cold weather the ventilators have not always been kept open, and owing to the overcrowding of the barracks it is probable that the men have suffered to some extent from defective ventilation of their dormitories. This may have been sufficient to act as a predisposing cause to infection and to account for the fact that the cases which have occurred in the garrison have been for the most part among the enlisted men occupying these dormitories. As a remedy for defective ventilation pieces of boards have recently been placed under the lower sashes of all the windows in the dormitories to allow the entrance of fresh air through the space thus left at the junction of the upper and lower sashes. This will answer as a temporary expedient, but in cold weather, with high winds, those sleeping near the windows will be apt to suffer from the draft of cold air. In my opinion not more than 25 men should be quartered in each of these dormitories. The water-closets now in use at the company quarters are not satisfactory, and estimates have been made for new ones. This is a desirable sanitary improvement, although I am not disposed to believe that the present arrangement is in any way responsible for the recent outbreak of typhoid fever.

The bathing facilities for the enlisted men of the garrison are very inadequate, but I am informed that estimates have already been made for increased facilities and more conveniently and comfortably arranged bathrooms. A new system of sewers is also being introduced and is partly completed. At present the sewer in rear of the officers' quarters and of the barracks occupied by Companies C, G and F is a roughly-made stone drain; "the cement has become rotten and has fallen out of the crevices, making it impossible to flush properly or to keep clean." The old drain from the hospital is no longer in use, but a connection has been made with the new system of sewers now in construction.

Supplementary report.—At the time of my visit to Madison Barracks (December 6) I commenced a bacteriological examination of the water supply. I had taken with me for the purpose a supply of test tubes containing sterilized "nutrient gelatin." A measured quantity of water (1 c. c.) from the general supply, obtained from a tap at the post hospital and from B company's quarters, was added to the liquefied gelatin in a number of these tubes and Esmarch roll tubes were made at once.

It has been shown by repeated experiments that the only way to obtain a correct estimate of the number of bacteria in a water supply is to make plates or roll tubes as soon as possible after the collection of the water, for if kept for twenty-four hours or more there is usually a very considerable increase in the number of bacteria as shown by the number of colonies which develop on such plates. Upon examining, at the Hoagland Laboratory, the roll tubes made at Madison Barracks after an interval of five days, the average number of colonies which had developed was found to be 125 per cubic centimeter. This is not in excess of the number which may usually be obtained from drinking water of good quality. The very much larger number found in the bacteriological examination made at the University of Pennsylvania, as per report dated Laboratory of Hygiene, University of Pennsylvania, November 21, 1892, (3,300, 3,700, and 4,500 per c. c. in the three samples examined) was doubtless due to the fact that some time had elapsed after collecting the water in bottles before the bacteriological examination was made, and that a large increase in the number of bacteria had occurred between the date of collection and of examination by bacteriological methods. A careful examination of the colonies which developed in my Esmarch roll tubes failed to disclose the presence of the typhoid bacillus or of any bacillus closely resembling it in morphology and characters of growth. The microorganisms found in greatest abundance were a small nonliquefying micrococcus and bacillus subtilis—several other species of common water bacteria were isolated, but no known pathogenic species was found. The bacteriological examination, therefore, corresponds with the chemical examinations made by Dr. Mew in failing to show any contamination which would justify a condemnation of the water supply at Madison Barracks.

But, in view of the liability to contamination by the sewage of the post and of towns upon Black River, and the recent outbreak of typhoid fever, I do not hesitate to reiterate the opinion already given, and to affirm my belief, that it is unsafe to use the water of Black River Bay for drinking purposes.

Appendix.—At the time of my visit to Madison Barracks I collected specimens of water from the "tap" at the post hospital and at B Company's quarters in sterilized glass flasks ("Sternberg's bulbs"), which were hermetically sealed. Upon my return to New York, forty-eight hours after collection, I added 1 c. c. of this water to liquefied flesh pepton-gelatin, in several test tubes, and made Esmarch roll tubes. At the end of four days, at 22° C., a large number of colonies had developed in these roll tubes, averaging more than 3,000 per c. c. of the water, showing an increase in the number of bacteria during the time the water had been kept after collection of more than 2,800 per c. c.

This illustrates very well the fact referred to in my supplementary report, viz., that the number of bacteria found in water which has been kept for a day or two is not a reliable test of the potability of a water supply.

Naturally the number will be greater in water which contains a considerable amount of organic matter to serve as pabulum for the germs present; but the amount of organic matter can be more accurately estimated by a chemical analysis, and the bacteriological analysis is chiefly valuable for determining the presence or absence of known pathogenic bacteria, Of course, a negative result only shows the absence of such pathogenic bacteria in a small quantity of water, collected on a particular date, and can not be taken as evidence that the water is not, or has not been, at some previous date contaminated with such "germs."

During the latter part of the fiscal year three cases of typhoid fever occurred among the fifteen men stationed at Kennebec Arsenal, Augusta, Me. Capt. M. W. Wood was sent from Fort Preble, Me., to investigate the causes of this outbreak and suggest measures for preventing its spread. He attributed the disease to the sewage-polluted water supply from the Kennebec River, considering that the outbreak at the post was merely its participation in the febrile attacks common in the city from the same cause, and proposed the substitution of a spring water supply, which was approved by this office after a careful examination of the water. The change in the water supply is now in progress. Capt. Wood's report is as follows:

* * * In the quarters of the single men there was found in the cellar a pipe leading direct, untrapped, to the sewer, which formerly took the waste from the bath tub. When the tub was removed to another room the opening in the pipe was not stopped. This had been the case since 1889. The cellar itself has a dirt floor, is damp and foul. The down spouts all lead direct, untrapped, to the sewer. The soil pipe from closets, etc., has no trap disconnecting it from the sewer. This, together with the present method of heating the quarters, with stoves, which in extreme cold weather is hardly adequate to do it properly, obliging the windows to be kept shut tight and preventing proper ventilation, * * * In quarters No. 1, those of the commanding officer, two openings were found in the cellar, leading direct to the sewer, untrapped. * * * In the same cellar was found a soil pipe that had formerly been used to carry off the waste from a washtub, etc. These fixtures being removed, the opening over which they had been placed was left untrapped until recently, when its existence was discovered. * * * The cellar floors of most of the buildings are laid on the ground and are rotten and should be taken up and replaced by concrete. The cellar under the room used as a ward of the hospital has simply a dirt floor, damp and foul with decaying vegetation. * * *

The water supply of the post is from the mains of the city of Augusta on the opposite side of the river, and the source is the Kennebec River. * * * Augusta alone of all the large towns on the Kennebec River uses this great sewer as the source of nearly all of its water supply. There are, however, two other sources for part of the city, known as the Devine Springs and the Vickery Springs. The latter named supply only the twenty to twenty-five families who are tenants of the Vickery houses. The Devine Springs are the property of the Augusta Water Company, who charge $10 per tap for this "pure, wholesome water," while they charge but $8 for the Kennebec River water. These springs consist of fifteen catch basins communicating with a common outflow, and are built over springs in a pasture to the west of the city. * * * The largest is an earthen-walled reservoir, over which stands a tumble-down frame shelter. It is a foul appearing place, containing about 2 feet in depth of water, which is bluish, opalescent, almost milky, covered with a foul scum. The bottom is a slimy, clayey mud, and in and upon the water are decaying boards and timber enough to cover half its surface. The earth walls have caved in in several places The water from these foul sources, when drawn from a tap in the city, has the physical characters of a pure water as compared with the Kennebec River water, and notwithstanding its higher price, is used by many because of its reputed wholesomeness. It appears to be a fact that those who confine themselves to this water, and do not contaminate it with Kennebec River ice, have no typhoid fever. The supply of Kennebec River water is received through a pipe laid on the bed of the river just above the dam in front of the city. Through this pipe the water flows by gravity to the filter in the pump house, and is then pumped, under a pressure of 125 pounds to the square inch, to a large reservoir on a hill to the westward from the city, at an elevation of 290 feet above the principal street of the city. From this reservoir it is distributed by gravity.

The water in mass, before filtration, is very dark, almost coffee-colored, and contains much visible suspended matters. It appears more transparent in the city reservoir, which I inspected, but this must be due to the removal of suspended matters, though it still contains much of these as drawn from taps in the city and at the

arsenal. The reservoir appeared to be very clean, and the stones beneath the surface of the water were not at all slimy. The filters (two), which are used singly, alternately, are the S. D. Warren filters, each 8 feet 1½ inches in diameter. On the day when I visited the water works the pumps were raising 142,140 gallons per hour, or about 19 gallons per hour for each square inch of filter surface—rather more than this if we deduct the area of a section of the shaft which passes vertically through the center of the filter. This shaft has projecting horizontal arms, which churn up the filtering material so as to allow the water to pass more rapidly. Though the effect of the filter must, at best, be slight, so enormous is the quantity passed that the contents of the filter appeared to be a foul, dark mass of liquid.

These filters are ostensibly cleaned periodically by stopping the outflow, introducing a quantity of water above them, churning up the filter, and then drawing off a portion of the supernatant liquid, now no longer properly called water.

The principal sources of the water of the river are a number of lakes (or ponds, as lakes are generally called in Maine), which for the greater part are surrounded by dense forests, and the water of many of these is dark and in appearance like swamp water. There are other sources to which much of this color may be due. The river throughout nearly its whole length is a great highway for logs for the lumber trade and the wood-pulp mills, and the hundreds of thousands of these, during the attrition to which they are almost constantly subjected, must yield up coloring matter from their bark. The thousands of tons of sawdust, too, which are annually poured into the river can only have the effect of increasing the amount of its color. The refuse liquor from the digesters of the wood-pulp manufacture, and which is a very dark liquid, adds its quota to the color. A superintendent of one of these establishments, describing this liquor to me before I had seen any of it, said that it had the appearance of Porto Rico molasses. Four tons of sulphur are used daily, with 100 barrels of lime, in the production of sulphite of lime, which, by its action in the digesters, for a period of five hours at a temperature of 220° F. upon the fine shavings of spruce, produces this molasses-like liquor as a waste product, which is discharged into the river. A small quantity of this suffices to darken, perceptibly, a large quantity of water, as may easily be determined by experiment. * * *

Maine has the usual laws for the compulsory notification of infectious diseases, including typhoid fever, but the great practical bearing of the observance of such laws has evidently not been sufficiently inculcated, and it is but too evident that the statistics will not show the facts.

The health officer for the year prior to March 26, 1893, after a careful consultation of his records, informed me that 45 cases of typhoid had been reported to him in his year of service, and his successor has had 7 cases reported since.

One physician told me that he and his associate had had 28 cases of typhoid fever during the winter and spring, which were not reported, and another, who was city physician from March, 1892, to March, 1893, informed me that he alone had had 22 cases of undoubted typhoid fever since February 1, 1893, all having characteristic symptoms, all among people who used Kennebec River water, and that none of these cases had been reported. He said that the epidemic broke out immediately after a thaw and rains, which flushed the sewers and drains of Waterville, where there had been 4 cases during the winter.

* * * * * * *

The valley of the Kennebec is well populated, and towns of varying size are on both its shores. Above Augusta, at a distance of 10 miles, are Vassalboro on the east bank and Sidney on the west, with a population of 2,052 and 1,334, respectively. Eight miles farther up are also two towns, Winslow on the east, with 853, and Waterville on the west, with 7,107. The latter town is tolerably well sewered, and the sewers discharge into the Kennebec. Two miles farther up is Fairfield, on the west bank, with 3,510, and 3 miles farther up is Benton, on the east bank, with 1,136. * * * Bad as is this showing, it is not all. Two wards, 4 and 7 of the city of Augusta, and a considerable portion of ward 3, with a population of 2,800 to 3,000 or more, and among whom a large proportion of this city's cases of typhoid fever has occurred, and where much of its filth and bad sanitation is found, lie above the intake, many of the people living in houses which are at an elevation of 75 to 100 feet above the river. The shore of the river along the front of this section is dirty and foul smelling, littered with sawdust deposited by the high water, and with garbage and other rubbish.

* * * * * * *

It seems quite certain that no artificial filtration, and certainly not the system in use, can extract pure, wholesome water from this solution of various substances used as the source of supply for the capital city of this State.

* * * The solution of the problem of the water supply of Augusta is impeded by the vested interests of the water-works company, and although an abundant supply of apparently pure, uncontaminated water can easily be found within 8

miles of the pump house, involving only the expense of constructing gravity pipes to the source, it is doubtful whether the dollars and cents represented by the present company will soon be overcome.

* * * * * * *

The post of Kennebec Arsenal had at one time a tolerably elaborate system of springs, catch-basins, cisterns and connecting conduits, but the most obvious indications were ignored, and well known laws of sanitary engineering were violated. No adequate measures were taken to secure the outflow of the springs free from seepage in the catch-basins, which were not constructed in such manner as to secure their permanence. No adequate measures were taken to prevent surface water from entering the catch-basins nor to secure them from accidental or mischievous contamination by solid matters, such as drowned animals.

The conduits, in some instances of improper materials, were not properly laid nor kept in repair. The cisterns were not properly cleaned and kept clean. They were not secured from accidental or mischievous pollution. The system did not furnish sufficient quantity or pressure for fire purposes, and it is therefore not to be wondered at that a commanding officer should recommend a general introduction of water from the Augusta water pipes or its general use after introduction. An inspection of the various springs, some of which are but "wet weather" springs, showed one with a bottom partly covered with solid rock, which spring has a history of permanence. Being unused and unprotected it was of course neglected, and contained a quantity of leaves and other rubbish which had blown or fallen into it. But it contained bright, clear, transparent water, without taste or odor, for it was flowing perhaps 1,000 gallons per day. The prospect was a promising one. It was emptied, excavated to an additional depth in that portion of the bottom floored by earth, which was found to be a heavy clay containing gravel, and also containing some seepage water. But the main supply was found to come clear, cold, and sparkling from the clefts of the bedrock. The excavation completed, the floor and circular wall of the catch basin were scrubbed with a new scrubbing brush and clean water, then carefully rinsed with clean water and emptied; then scrubbed with a strong solution of permanganate of potash, carefully rinsed and emptied; then again carefully scrubbed with clean water, rinsed and emptied; and now the yield of the spring was found after a prolonged test, to be at the rate of 1,535 gallons per day, and with the catch-basin full its temperature was found to be 44° F. at 11 a. m., May 31. It was allowed to fill and discharge over night, then emptied and called clean, and on its refilling a sample of one gallon was collected and sent to the Surgeon-General's Office for analysis and examination. The conduit from this spring to the system of (formerly) connected cisterns was found to be unglazed drain tile, which was laid in a ravine and broken in several places.

The measures necessary to be taken for the utilization of this source of supply and its conduction to the cistern reservoir (to be described) were discussed with Maj. McGinniss, and the execution of the work in a proper manner may safely be left to him. The cistern reservoir consists of a once fairly well constructed series of four nearly cubical chambers communicating by pipes and separated by substantial partitions, with a large manhole in each partition, so that when emptied the Major and I were able to pass through the series and personally inspect the floors, roofs, and sides. The capacity of the cistern as a whole to the overflow pipe, after deducting the obstructions and the rectangular brick pier in the center of each chamber, which supports the arched roof, was found to be over 31,200 gallons.

Though somewhat out of repair, and unprovided with means for securing the manhole in the roof of each, so as to prevent contamination of the water and still permit its inspection, they can readily be repaired, cleansed, as was the spring catch-basin, properly connected with the spring, and then, if the spring water be found pure and wholesome, they will furnish a supply of pure water cold enough to need no ice, sufficient for a much larger command than the present garrison, for use for all purposes of conveying water to the stomach, and at the same time provide for the maintenance of a constant reserve sufficient to tide over any probable prolonged drought.

It has happened on several occasions in the experience of Army medical officers that typhoid fever has appeared in a command when the most searching investigation has failed to discover any unusual insanitary condition except a want of ventilation under the floors of the buildings in which the outbreaks occurred with rotting of the flooring and dampness and organic decay underneath. The last instance of the kind published was the occurrence of 23 cases at Fort Assinniboine, Mont., in 1889.* An earlier experience of the same kind, published

*See report of Surgeon-General, 1890, p. 29.

in Part III, medical volume of the Medical and Surgical History of the War, p. 497, was reported in 1873 by Capt. McElderry from Fort Klamath, Oreg. During the past year a similar occurrence took place at Fort Yates, N. Dak. Although the insanitary conditions at this post included a contamination of the surrounding soil by disused privy pits filled in and covered over when the earth closets now in use were erected, the unventilated site and decayed flooring of the barracks are worthy of special notice in view of the above-mentioned experiences. Capt. A. R. Chapin reported from Fort Yates that—

> During the past three years while I have been post surgeon the first case and the majority of all the cases of typhoid fever have come from F Troop, Eighth Cavalry. In the effort to find and eradicate any possible cause my attention was, among other things, called to the floors of the cavalry barracks. While perhaps hardly probable that in their condition is to be found the cause of this disease, they are in a very insanitary condition—worn half through. In many places they are filled with large cracks and rough places from which it is impossible to remove the dirt. The dormitory floors are in such condition that a very little water put on them will run through and drop into the room below. Besides this, I am informed on good authority that the room now used as dining room by Troop F was, by a troop formerly occupying this barrack, used as a wash room and the water poured through holes in the floor and allowed to soak into the ground under the building. The smell of rotten wood, which in these buildings could hardly come from anywhere except the floor, is very noticeable after a room has been closed for a few minutes. I would respectfully suggest that these floors be at once torn out and replaced by new hard wood ones, and that the surface of the ground under the building be removed and fresh earth and lime scattered thoroughly over the whole surface.

Early in May 4 or 5 cases considered to be typhoid fever appeared among the guests at the Hygeia Hotel, Old Point Comfort, Va., which is on the reservation outside the walls of Fort Monroe. Three cases occurred at the same time among officers and their families living in the fort or just outside, all of whom messed at the hotel. No case occurred among the other officers and the enlisted men and their families, although there were 2 of doubtful character in hospital reported as continued fever. There has been no death and no new case since May 13, so that the infection, whatever it was, has been removed. It was not considered to amount to an epidemic, and it was not reported until the cause could be traced out if possible. The fever appeared at a time when the place was full of visitors and the hotel crowded on account of the naval rendezvous in April, and a careful investigation failed to discover any cause of contagion. It was thought possible that some impurity had got into the drinking water at the hotel, which was intended to be all rain water; but there was also a supply from a well beyond Mill Creek used for other purposes than the table, which might have got mixed with the rain water. It was at once recommended that all water intended for drinking should be boiled, and none but rain water used for any such purpose, which was carried out, and whether on that account or not the disease disappeared.

There was some alarm at the time among visitors. Every person taken sick there or soon after leaving was said to have typhoid fever; but nearly every case that was accurately traced up proved to be either malarial or some ephemeral fever.

Erysipelas.—Twenty-eight cases, 1 fatal, were reported. Eighteen posts had 1 case each, three 2, and one 4 cases; the causes to which the spread in the last instance was ascribed may be learned from Capt. Munday's report given below (p. 104).

Influenza.—Of this disease 1,793 cases were reported, the largest number at any one post having been 141, 1 fatal, at Fort Custer, Mont.

Many posts reported no such cases, but these had usually an increased rate for catarrh and bronchitis. A total of 6 deaths was ascribed to this disease.

Measles.—The cases, 187 in number, of this disease were all of light grade. At the recruiting depot, Columbus Barracks, 52 cases occurred, and from this post the disease appears to have been conveyed to a few of the others. Generally, however, the infection was introduced from some community in the vicinity of the military station. Seven posts had 1 case each, seven 2, four 3, two 4, one 5, five 6, two 7, and one 8, 10, 13, and 14 respectively.

Mumps.—During the year 149 cases of mumps were reported, 43 of which occurred among the recruits at Columbus Barracks and 19 at Fort Yates; thirteen posts had 1 case each, three 2, four 5, two 10, and one 3, 6, 8, and 11, respectively. During the current year two notable epidemics occurred at Forts Apache and Buford. Of 40 cases at the former post most of the patients were Apaches of the Indian company. Metastatic orchitis occurred in 33.3 per cent of the cases. Of 30 cases at Fort Buford, 8, or 26.6 per cent, had orchitis.

Rötheln.—A few cases were reported from Forts Leavenworth and Grant and Plattsburg Barracks.

Scarlet fever.—Only 9 cases were reported as having occurred among the troops, 4 at Fort Myer, 2 at Fort Logan, and 1 each at three other posts. The disease appeared also among the children at a few posts, but was in all cases prevented from spreading by careful isolation and efficient disinfection.

Smallpox.—Only 1 case, at Fort Marcy, was reported during the year. This disease has been extensively prevalent among the Mexican population, so that the occurrence of only 1 case in our border garrisons shows the efficiency of our protective measures.

Tonsillitis.—Cases, making a total of 1,014, were reported under this heading from nearly every military station, the highest number from any one post being 52, from Columbus Barracks. It is impossible to say what proportion of these consisted of a merely local inflammation of a portion of the digestive tract and what proportion was due to a specific cause entitling the cases to be regarded as belonging to the class now under discussion; but remarks are so frequently appended to sanitary reports indicating the connection of these cases with defective drainage and sewerage, polluted soils, and neglect of proper ventilation of dormitories, that it would seem advisable from the standpoint of practical sanitation to regard them as more intimately associated with the specific febrile and acute infectious diseases than with the diseases of the digestive system.

Whooping cough was reported from Fort Monroe, Angel Island, and Fort Custer; 4 cases among the troops at the last-mentioned post and 1 each at the others. Few cases are reported as having occurred among the children. The following remarks by Hospital Steward F. G. Walters on its prevalence at Sandy Hook, New Jersey, illustrates the impossibility of preventing the invasion of a post or place by this disease if inhabited by persons susceptible to its attack:

There has been no new case of pertussis and the epidemic may be considered as at an end. It was remarkable for the manner in which it was brought here. After careful investigation the infection can be traced only to the inhalation by some of the children living here of the atmosphere, diluted at that, which the infected children had inhaled. A friend of one of the residents paid a visit to this post one evening, accompanied by his two children who were convalescing from an attack of pertussis. The morning after their arrival it was known that these children had the whooping cough, and all children living here were kept away from them. The visi-

tor and his children left in the afternoon, and on the road to the boat landing passed two little girls, who, however, had no conversation with the strangers, but merely stood still and looked at them passing by. About ten to fourteen days after this the two little girls complained of what was at first thought to be a common cold, but which afterwards developed into characteristic whooping cough. This disease then ran its full course, attacking the other children in the same household. After the disease had become characteristic there could be no doubt that the infection was caused by the slight exposure mentioned, and that the infectious germ or principle must have been inhaled when the children passed by each other. About the same time one of the men showed symptoms of the disease. He stated that he had no conversation or intercourse with the children, but merely was sitting or standing on the veranda where they were and at a distance of several feet. This man had never had the disease. The whooping cough became epidemic at the post, attacking all children who were not protected by previous attack, and also several adults of both sexes.

DIARRHEAL AFFECTIONS.

These diseases had an admission rate of 110.85, as compared with 108.21 during the previous year and 162.30, the average annual rate of the previous decade. Diarrhea caused 108.04 of the rate and dysentery 2.81; but the nonefficiency occasioned was slight, only 1.13 per thousand of strength, as the average duration of the cases was short; diarrhea, 3.4; dysentery, 15.9 days. No death occurred among the total of 2,615 cases of diarrhea, including cholera morbus, nor among the 68 cases of dysentery reported. Reports as to causation refer these affections in a doubtful way to errors of diet and the continuance of high atmospheric temperatures, for most of them were recorded during the hot season. Forts Monroe and Hamilton, Davids Island, Fort Barrancas, and St. Francis Barracks had the largest rates.

In reporting some choleraic cases which occurred at Fort McPherson Maj. Cleary attributed the attacks to poisonous milk. All those affected became sick in from one to three hours after breakfast, and all of them used milk from the same source of supply. Six of the men thus attacked ate meat also for breakfast, but 5 made use of bread and milk only, and these 5 were severely attacked; for a time the recovery of 3 of them was doubtful. Maj. Cleary reported—

> I find it to be the custom of the milkman to deliver milk in bottles. He did so in these cases. The men use the milk but do not clean out the bottles, and next day the milkman collects them. I feel satisfied that the milk allowed to remain in the bottles decomposed, causing a poisonous product; and milk was again put into these bottles without properly cleaning them, thus causing the attack. To prevent such occurrences all such vessels should be thoroughly washed with warm water gradually increased up to near the boiling point.

MALARIAL DISEASES.

The admission rate for malarial diseases was low, 63.75, practically the same as for the previous year, but a marked improvement on 92.93 in 1890, and 120.20 in 1889. The rate of nonefficiency for the year was 1.76. No fatal case was reported among the total number of 1,543 cases recorded. Intermittents, 1,131; remittents, 309, and other malarial diseases, 103. Seven cases reported as typho-malarial are not included among these. As usual, the prevalence was greater among the white than among the colored troops, the admission rate for the former having been 68.43; for the latter, 26.03.

Washington Barracks, Fort Sill and Fort Myer had high admission rates, 563.25, 474.00, and 466.11, respectively. Fort Clark, with only 205.61 admissions, had the largest nonefficiency, 15.00; Fort Sill, the next in order in this regard, having only 8.87. The average duration of each case at Fort Clark was 26.70 days, at Fort Sill, 6.85, while the cachexia

of the cases at Fort Ringgold necessitated a prolongation of the average duration of treatment to 71 days. The post surgeon of the last-mentioned post insists that the malarial disease which adds so largely to the nonefficiency of the garrison is not in any way due to conditions existing at the post, but to those prevailing in the country in which the troops operated during the spring and summer. Washington Barracks and Fort Myer had nonefficient rates of 7.32 and 6.46, respectively.

The fevers at Fort Clark were remittents of a severe type, in many cases resembling typhoid fever, and, as a matter of fact, some of the cases developed late in the season displayed the characteristic eruption of enteric fever, and in one fatal case (Peyer's) patches were ulcerated. It was observed that the number of cases was always increased after heavy rains, which flooded the basin of the spring contaminating the water supply with surface washings. Plans for the protection of the spring were considered during the year. (See below, p. 125).

Reports from Maj. James P. Kimball, Capt. E. A. Mearns, and Capt. W. B. Davis, at Fort Clark, are submitted herewith:

MAJ. JAMES P. KIMBALL.—*September.*—The sickness in the command is excessive. There are 32 men on sick report. The mean daily number on sick report during the month has been 32, which is 10 per cent of the mean strength of the command. The prevailing diseases are remittent fever of a severe type, in many cases closely resembling typhoid, acute diarrhea, and dysentery. There have been 25 cases of remittent fever under treatment during the month, of which number 2 were taken sick in July, 11 in August, and 12 in September. Of this number 9 have been returned to duty and 16 remain under treatment. * * * It is my opinion that the character of the water supply would be improved by the removal of the vegetable growth in the pond, where this can be done thoroughly. It has been established by exact experiment that the microbe of cholera is capable of enormous multiplication in water containing organic or vegetable material, and there is no reason to doubt that such is also the case with the germ of typhoid fever. In such a mass of vegetation as now fills the pond there must be more or less decaying matter, which in any case ought to be removed. That the long continued high temperature of a southern Texas summer is largely instrumental in the production of the fevers which so often prevail, I think, admits of little doubt, and that exposure to the midday sun ought, as much as possible, to be avoided.

October.—There continues to be an excessive amount of sickness at the post, due to the continued prevalence of remittent fever. The number remaining under treatment September 30 with this disease was 16; the number taken sick during October, 18; returned to duty, 14; leaving 20 cases now under treatment. The mean daily number of all cases on sick report during the month has been 25; that is, 8 per cent of the command.

It has been noticeable during the past three months that the number of new cases of fever has increased after heavy rains. During the 21st, 22d, and 23d instants, 3½ inches of rain fell. From the 1st to the 18th instant there were 8 new cases, then none until the 24th; and from the 24th to the 30th, 10 cases.

CAPT. EDGAR A. MEARNS.—*November.*—The health of the command has been good, except that there has continued to be a large number of fever cases—32 cases of remittent and typhoid fever having been under treatment during the month, of which number 12 were new cases, the remaining 20 having been taken sick prior to the first of the month. Five cases of typhoid fever were treated during the month, with 1 fatal, in which were revealed the intestinal ulcers of typhoid fever. Three of the remaining 4 cases have developed the characteristic skin eruption of this disease upon the abdomen, and have otherwise run a typical course, the remaining case having been recently taken sick.

Whether these fevers have resulted from the surface drainage, from contamination of the source of water supply, or from still other causes, I am unable to say, but it is highly important, in my opinion, to provide as far as possible against a return of this scourge next year by guarding the post spring from defilement in the manner recently recommended by Dr. Kimball. This work, moreover, should be finished before the advent of hot weather.

CAPT. WILLIAM B. DAVIS.—In the summer of 1892, while post surgeon at Fort Clark, Tex., 30 or 40 cases of so-called Texas fever, a hybrid in symptoms between typhoid and malarial-remittent fever, though not amenable to the treatment of either, came under my care. In every instance the disease was found only among

those men whose barracks were to the leeward of an open drain (about 50 yards distant) and who did fatigue duty in the broiling sun.

That this drain was a potent factor in producing the disease is conclusively established by the fact that there were from 10 to 15 laundresses' quarters on the windward side of the drain (occupied by married soldiers and their families) and not a single case appeared among them; nor did any case appear in the officers' row, which is also to the leeward of the drain, but at such a distance that the poison would necessarily be so diluted as to be innocuous. Moreover, the men's quarters were single-story buildings, while the officers' families all occupied rooms in the second story. That the drinking water was not to blame is, I think, proven by the fact that the same water used by the men in barracks was also used by the families of the officers and of the married soldiers, among whom, as was mentioned above, there were no cases. Again, I had a considerable practice in the adjacent town of Brackettville, and though their sole water supply was the same as that used by the post, not a case of fever occurred.

I am informed that when the fever was so bad at this post (Sam Houston) two or three years ago, the greatest number of cases occurred in the barracks in the southeast corner of the square which is the nearest to the meadow to the southeast of the post, into which all the drains of the post empty and from which direction comes the prevailing wind.

There is no description of this disease to be found in any work I have consulted; and a new arrival, if confronted with it, thinks at first he has typhoid to deal with, but the sense of wellbeing, the comparatively slow and strong pulse, the absence of marked iliac tenderness, etc., make him change his diagnosis to malarial fever (remittent); but when quinine has been ordered and the temperature immediately and invariably goes up one or two degrees, he is in a quandary. The cold pack, which is so successful in reducing the temperature (temporarily at least) in typhoid fever, has on several occasions in my hands run the temperature up from 104° to 106°, while I was searching for some means of combating the disease. Finally, the conviction was forced upon me that the *materies morbi* was a ptomaine generated in the intestinal tract, caused by a germ from without, and the next question was to find a suitable agent for disinfecting the *primæ viæ*. Pearson, of Cape Colony, Africa, having called attention some years ago to the value of chlorinated solution of soda internally in typhoid fever, I determined to use that, and to supplement it by acid salicylic, or salol. My experience has been very gratifying, and if a case reports within two or three days after the inception of the fever, it can be aborted within a week, and can be favorably affected at any stage of the disease. Routine treatment is as follows: Liq. sodæ chlorinat, m., xv–xxx, in an ounce of water every three hours; acid salicylic, gr. v, in capsule, every six hours (or salol, gr., x thrice daily). Liquid diet, preferably milk or koumiss. I may mention that under any other plan of treatment that I have seen or heard of, the fever lasts from four to six weeks or even longer.

For many years back remittent fevers have prevailed with more or less intensity at Fort Myer, Va., and have been attributed to the low grounds of the Potomac and of its tributary valleys. The post is situated on an elevated plateau, which is screened by fine trees from the malarious exhalations in its neighborhood. Soldiers affected by malaria were supposed to have contracted their disease by exposure to pernicious miasms while passing after nightfall through the low grounds in returing to their post from the city. During last autumn the number of cases was so great as to call special attention to the conditions, and a medical inspection of the post was ordered. It was found that in September the garrison of 290 men had 85 cases of sickness, of which 52 were cases of remittent fever. Women, children, and civilian employés were affected in like proportion. The attacks were controlled readily by quinine. This local prevalence of malarial fever was attributed by the inspectors to malarious water in the shallow wells from which the post was supplied. These wells are situated in a ravine in front of the post and are fed by its subsoil drainage. During seasons of rain and snow the supply suffices for the use of the garrison and is held to be fairly good in quality, but at the time of the prevalence of the remittents the inflow into the wells was small and of unsatisfactory quality, as shown by its free ammonia, chlorides, nitrites, nitrates, and organic matter. The use of this water in its fresh state for drinking

purposes was interdicted. Directions were given that it should be boiled before being used; and recommendation was made that the post be supplied by connecting it with the Washington, D. C., water mains. Congress failed to authorize this connection, and the post continues dependent on its wells. During the coming autumn the water will have to be boiled or thoroughly filtered to prevent a recurrence of the remittents which were so prevalent in September last. The following is the report of Maj. Charles Smart and Dr. William M. Mew on the water supply and fevers of Fort Myer:

Fort Myer is situated on a plateau distant about half a mile from the Potomac River and elevated about 200 feet above its surface. The line of officers' quarters is on the river-side edge of the plateau, and from this edge the surface makes a rapid descent for about 150 yards into a sandy hollow, where three wells have been dug, each about 25 feet deep, 10 feet in diameter, brick-lined, and suitably covered. The water from these wells is pumped into elevated tanks for distribution to the garrison.

At the time of our inspection, 3 p. m., we found about 4,500 gallons in one tank, its capacity being 20,000; two other tanks, each capable of containing 10,000 gallons, were empty, and the water in the wells was so low that a can dipped into them brought up samples faintly cloudy from minute floating particles, raised from the bottom by the disturbing act of filling the can. Probably not more than 500 gallons could at this time be pumped into the distributing tank, making a supply for the day of 5,000 gallons.

We learned from the commanding officer and the men in charge of the pumping station that the average quantity of water available daily for the past two months had been about 5,000 gallons. To fully satisfy the needs of the garrison, 30,000 to 35,000 should be supplied, and this seems to have been the estimate on which the capacity of the distributing tanks (40,000 gallons) was based.

During the rains and snows of winter and spring the wells furnish an average of 30,000 gallons; but in the hot months, and particularly during such long-continued dry weather as occurred in the past summer, the supply is wholly inadequate to keep the post and its garrison in good sanitary condition.

Sewers, water-closets, and urinals are foul from want of water to flush them efficiently. Bathing has been practically stopped during the summer, and the horses have for weeks been watered at a creek, which receives much foul drainage from the fort and its neighborhood.

Even if this supply were at all times amply sufficient, its quality is such as to excite grave doubts as to its wholesomeness. Shallow wells are dangerous and are used only as individual supplies in the early stages of the settlement of a new country until a purer general supply can be obtained by the coöperation of the individuals. Such wells are especially prone to disseminate malarial remittent fevers and to become infected with typhoid, particularly when their waters are low. The diminished prevalence of malarial fevers, not only at our military posts, but in the civil communities of the United States during the past quarter of a century, is due in a great measure to the substitution of a pure water supply for the surface waters and shallow wells used at an earlier period.

At the site of the wells at Fort Myer there was originally a spring, but the spring water which enters the wells is now lost in the preponderance of subsoil water which drains into them; in fact, it appears to us that if this post had a good system of subsoil drainage, with efferents emptying into the creek, the wells would become practically dry. This opinion is based on a survey of the surroundings of the wells, and is sustained by the chemical analysis of the water. It is essentially a rain water which has flowed over a soil rich in decaying vegetation, and which, in passing through the soil into the wells, has not undergone a natural filtration sufficient to purify it. It contains more than an allowable quantity of free ammonia and of chlorides, derived in great part from animal excretions. Its organic matter is also in excess. The presence of nitrates shows that the partial filtration has had a purifying influence, but the associated presence of nitrites indicates that the source of the impurity is so near to the wells that the process of change is still in progress when the water is distributed for use. The greater part of the organic matter is of vegetable origin and in process of fermentative change. It is, in fact, a surface water, with strong possibilities of malarial qualities; and in view of the fact that the prevailing disease at the post is now remittent fever, we are at liberty to suggest the probability rather than the possibility of malarial qualities.

During September there have been 52 cases of this fever among the troops of the garrison, averaging about 290 men. Women, children and employés have also been affected. The attacks last from four to six days, yielding readily to quinine, and

thus manifesting their malarial origin. The total sick from all causes from September 1 to 28 numbered 85, of which, as stated, 52 were cases of fever. In July there were only 4 cases, and in August 6, of malarial fever.

In considering the excess of fever in September, it is to be remembered that an unusual prevalence has been manifested at other points than at Fort Myer. At Washington Barracks, for instance, there were, up to the 28th, just as many cases of malarial fever, to wit, 52, as at Fort Myer, but the garrison had a somewhat greater strength, 380 men. In July Washington Barracks had 13 cases, and in August 17.

There is, however, one notable difference in the character of these two posts, *i. e.*, remittents exclusively prevailed at Fort Myer, intermittents at Washington Barracks; and this has a bearing on the probability of unwholesomeness of the water at the former post, for when malarial fevers are recognized as due to malarious waters the fever is generally of the remittent type.

In view of these observations it is evident that an adequate supply of good water should be obtained for Fort Myer. Such a supply would probably put an end to its remittent fevers, and the elevation of the post would probably keep it free from the intermittents which infest such low grounds as those of Washington Barracks.

To aid in accomplishing this result, it is needful, however, to do something more. The plateau on which the post is built is level and retentive of moisture. With one or two exceptions the buildings have been erected without any attempt to drain their sites. In rainy weather the surface is miry and the subsoil saturated. Basements become damp, and those buildings that have no basements are in a yet worse condition. Rain leaders pour out the water from the roofs on the ground within a foot of the wall to percolate along it and increase the dampness of the site. A system of subsoil drainage that would free the surface and subsoil from excessive moisture would do much to improve the healthfulness of the post.

The piles of stable manure, garbage, and other filth in a ravine in rear of the stables should not be permitted to accumulate; if no other disposition can be made of them, provision should be made for their cremation.

So far as we can see, the solution of the question of water supply at Fort Myer is to be found in effecting a connection with the supply of Washington City. There is, as we understand, no engineering difficulty in the way of effecting this; all that is required being the needful authority and money. As some time will be required for a radical change of this kind to be made, provision for the immediate future is needful. There is no reason why the water of the existing wells should not be used for all purposes other than drinking and cooking. It may be used for flushing sewers and urinals, for washing, bathing, etc.; and, as the dry season may be considered to be now at an end, there will probably be, until June next, the daily average product of 30,000 gallons. Should the dry season be prolonged for some time, the post would have to continue during the period on its present limited supply. There would be inconvenience in this, but no ill health, as it seems to us; for the remittent fevers which now affect the garrison are not the result of the insufficient supply, but of the impure supply. For drinking or household use it would be unadvisable to use this water. Until a general supply for all purposes is obtained, distilled water might be furnished.

At Forts Brown, Ringgold, Clark and other posts ice machines have been issued, primarily for the use of the sick; but, incidentally, by attaching a condensing coil they have furnished a supply of pure drinking water to the garrisons, and the sick reports of malarial fevers have been materially lessened in consequence. Fort Brown, in fact, which formerly was notorious as the most insalubrious site held by the United States troops, has practically had no malarial fever since the introduction and use of distilled water instead of the turbid and malarious water of the Rio Grande.

Distilled water for potable use is recommended merely as a temporary expedient to cover the period that will elapse until a permanent and good general supply is obtained. If delay is experienced in procuring distilled water, the well water should be boiled before it is used as a supply for drinking.

It is of interest to observe that while the garrison of Fort Myer, Va., was suffering from remittent fever the troops stationed at Washington Barracks, D. C., on the low grounds on the other side of the river, also were affected with malarial fevers, only in the latter instance the disease was of the intermittent form. The presence of malarial exhalations in this locality accounts for the prevalence of the disease. The insalubrity of this post has been materially lessened of late years in proportion to the progress of reclamation of the Potomac marshes. There remains, however, the James Creek Canal bounding the reservation on

the east. This canal is an open sewer, extending as such about half a mile into the city and receiving much drainage and sewerage. Some little current is derived from Tiber Creek and the tides, but the water is foul smelling at all times, and at low tides there is much uncovered bottom. That such a nuisance should have been tolerated so long in Washington, D. C., seems inexplicable. Fortunately the bank next the post is lined with a double row of poplars and willows, forming a dense screen of foliage which has no doubt done much to intercept malarious exhalations.

In connection with remarks on enteric fever at Fort Reno, Okla., submitted above (p. 44), the following report on the malarial fevers of that locality, by Capt. J. C. Merrill, is of interest:

The following notes on malarial fevers observed in the Indian Territory are intended to call attention to certain peculiarities of type, character, course, and diagnosis. They are based upon observations at Fort Reno, situated nearly in the center of the old Indian Territory. The surrounding country is an open rolling prairie, wooded only along the streams, the smaller of which usually dry up in summer, and even the larger ones in dry seasons. The fort is at the end of a point of land projecting from the prairie level into the valley of the north fork of the Canadian River, which stream is about 1 mile to the north; the prevailing winds at all seasons are from the south. The natural drainage of the post is good; drinking water for officers' use is brought daily from Caddo Spring, about 4 miles distant, and is of excellent quality; but the general supply, which is very impure, is river water pumped into settling tanks and distributed by pipes.

The Indian Territory has long been noted for the prevalence of fevers of a severe type, and the total mortality from this cause has been very considerable. The opening to settlement of Oklahoma, the breaking of ground for railroad construction and by farmers, and the rapid growth of new towns, chiefly notable for neglect of the most elementary sanitary measures, and for the placing of wells and privies side by side, have brought these fevers into greater prominence and caused the rapid spread of typhoid fever.

With the exception of returns and reports by medical officers of the Army, there is no special literature of these endemic fevers, and it is on this account that the following notes have been written.

The character of a majority of the cases admits of no doubt; they are certainly malarial. At first, and especially when an early formal diagnosis is made, they are liable to be recorded as intermittents; but on studying the progress of each case, and especially in reviewing a series of temperature charts, it will be remarked that perfect intermissions are rare, and that the majority of the cases are remittents. The greater number of these require no special notice; a 10-grain dose of calomel at night, followed in the morning by a Seidlitz powder or sulphate of magnesia, with about 20 grains of quinine two hours before the expected rise of temperature, and repeated when the sweating stage is well established will, as a rule, promptly effect a cure, which is much more apt to be permanent if full doses of arsenic are given for a week or two or until its constitutional effects are manifest. In severe cases in which more or less debility continues for two or three weeks, a tonic treatment of iron, arsenic and the tinctures of nux vomica and cinchona is useful in hastening recovery.

Recurrences of such febrile developments are not uncommon, but they are usually as amenable to treatment as the primary attacks and of the same remittent type.

The most severe cases, to which particular attention is invited in this paper, have a course quite unlike those just described; and their precise diagnosis, as considered below, admits of more than one opinion. In all the malarial fevers seen at Fort Reno the first and subsequent chills were slight, and in quite a number altogether absent, and this irrespective of the subsequent progress of the cases.

In the form now under consideration there is nothing at first to attract especial attention, but it is soon obvious that quinine has little or no effect in reducing the temperature or in mitigating or preventing the daily exacerbation; the patient rapidly loses strength and the difference between the morning and evening temperature becomes less marked. Diarrhea and constipation alternate; the stomach is generally but little affected, for nausea is uncommon and vomiting more so; neither the spleen nor the liver is enlarged or tender; the mind is clear; there is little or no headache, and the patient usually sleeps well. Perhaps the most prominent feature is the want of regularity in the recurrence of the febrile accessions or exacerbations. A well marked double quotidian has been several times observed, but generally there is but one prolonged rise lasting for several hours, and beginning

at any hour of the day or night without reference to previous rises; this irregularity renders the administration of quinine to anticipate a recurrence of the fever very uncertain.

An examination of a large number of temperature charts shows much diversity in the course and degree of the fever. Three points, however, at once attract notice, a well-marked remission after a continued fever of about two weeks, followed by a secondary fever, often higher than the primary one; and afterwards subnormal temperature and convalescence. The subnormal temperature is generally very pronounced, and seems to be independent of the previous administration of antipyretics. Although the diagnostic signs of typhoid fever are absent the typhoid condition is well marked, and weakness and exhaustion are often extreme, requiring free stimulation. Death, when it occurs, is due more to cardiac failure than to any other cause.

The diagnosis of this type of fever presents many points of interest. From typical typhoid it differs in its sudden onset and in the absence of early hebetude and later stupor, of epistaxis, tympanites, and the pathognomonic eruption. Cough and diarrhea may be present but are too variable and uncertain to be of diagnostic value. From typhoid fever as, in my experience it generally occurs in the southwest, the sudden rise of the primary fever, absence of the rose-colored spots, and the marked secondary rise of temperature, are important distinctions; in most other respects the two fevers are clinically much alike. From the commoner forms of remittent fever a very marked distinction is the slight effect of quinine in controlling the rise and course of the fever.

Several names may be considered for the purpose of making a formal diagnosis, but until opportunity is given for determining the presence or absence of intestinal lesions, any name must be considered as provisional. Typho-malarial is convenient and descriptive, if used without implying the presence of specific typhoid fever; but this term has been applied in such a loose way that perhaps it is better to avoid it. Adynamic remittent is appropriate enough as a name, and the cases agree with the definition given by Sternberg,* but they agree equally well with the form "which resembles typho-malarial fever in the type and duration of the febrile movement, and in the fact that it is not cut short by the administration of quinine, but in which the special symptoms of enteric fever are obscure or absent." Still it seems to me that such a fever, which Sternberg does not recognize as identical in etiology with a paludal remittent, comes too near his definition of adynamic remittent fevers—"which, instead of yielding to treatment within the usual time or terminating in simple intermittent fever, are protracted and develop adynamic symptoms, accompanied by more or less fever of an irregular character"†—to be easily distinguished at the bedside.

I have applied the name "continued malarial fever" to these cases although aware that this name is of too general application to be altogether definite and satisfactory.

The prognosis, although usually favorable, should be guarded, for if the patient have any constitutional weakness it is very liable to be developed and exaggerated, with serious, perhaps fatal, results. The heart, even if free from organic lesion, is often greatly weakened; in every case its action should be carefully watched. Indiscretions in diet generally cause a recrudescence of the fever, with or without diarrhea.

Complications.—Cardiac weakness, as just mentioned, is the most frequent and dangerous complication. Gastric irritation is not often troublesome, but in some cases it is better to give quinine hypodermically, and to give only food by the mouth. The solution of bisulphate of quinine has been frequently used, and in no case has local suppuration or any other unpleasant result occurred.

One case of hæmaturia was quickly cured by quinine. It appeared with each rise of the fever and lasted about three hours, the urine then being of the color of porter, but perfectly clear and normal in the intervals.

Treatment.—In all cases of fever at Fort Reno full doses of quinine were given at once, usually with calomel (grs. x) in the evening, followed by a brisk saline the next morning; and in the majority of cases this treatment resulted in a speedy cure. As a rule 20 or 25 grains were given two or three hours before the expected rise of fever, and a similar or larger dose when the sweating stage was well established. If this proved inefficient 30 grains were given in the same way next day, and repeated as indicated. Given thus I have found quinine more effective than by any other method, though I do not hesitate to administer it during the febrile stage if there is a necessity for so doing. If, however, after four or five days there is no decided improvement, it may safely be assumed that the case is not one of simple intermittent or remittent fever, but of specific typhoid or of the continued form under discussion, in which case it is well to reduce the quinine to tonic doses. During the

*Malaria and Malarial Diseases, N. Y., 1882, p. 250.

†*loc. cit.*

intermission between the primary and secondary fevers, I usually substituted for the quinine Fowler's solution in 5-drop doses three to five times a day, and returned to tonic doses of quinine during the secondary fever. Arsenic is borne remarkably well; I have given it for days in the intermission, and for weeks during convalescence in the above doses with the best results, and without causing the least gastric disturbance or swelling of the eyelids. Generally the primary fever is not so high as to call for special antipyretic treatment, but this is frequently necessary during the secondary rise. For this purpose antipyrin or antifebrin is superior to the wet pack, inducing free diaphoresis and promptly reducing the temperature from 2° to 4°. While these medicines have no curative effect they save the patient from the injurious effects of the high temperature, give great relief, and by hastening the sweating stage afford an opportunity of giving quinine much sooner than could otherwise be the case. I can not too highly recommend the use of one or other of these drugs in these cases; 10-grain doses of antifebrin and 15-grain doses of antipyrin act as promptly and efficiently as larger ones. The treatment in other respects is largely symptomatic; the diet is limited to milk, eggs, and similar easily-digested food, and much importance is attached to this. Stimulants are generally required, sometimes freely. In the later stages of the disease turpentine is sometimes indicated, and is given with excellent results. When signs of heart failure are present, digitalis is indispensable. I have seen more than one life saved by its free use, by which is meant the administration of 1 to 3 drams of the tincture in 24 hours, the patient being carefully watched that the amount given may be properly regulated.

Convalescence is slow; a temporary change of air and scene is the most effective means of cure; when this is impracticable, a general tonic treatment assists in obtaining the desired result.

In a small proportion of the cases permanent disability results from malarial cachexia, with chronic dysentery or diarrhea, which may be temporarily alleviated, but not permanently cured, while the patient remains in the malarious locality. One case of malarial hæmaturia became chronic, returning at intervals each winter whenever the patient was exposed to cold.

Fort Brown, Tex., continued free from malarial diseases during the year. The following letter from the post surgeon, Capt. George H. Torney, to the post adjutant, April 2, 1893, gives in full the views of the medical officer on the gratifying improvement recently effected in the health of this garrison:

In compliance with instructions received from the Commanding Officer directing me to submit for the consideration of the Brigadier-General Commanding the Department of Texas, now present at the post, a brief and succinct report regarding the causes which have led to the large reduction in the percentage of the sick list of Fort Brown since 1889, in which year it was reported by the Surgeon-General of the Army to have been the most unhealthy post in the country. I have respectfully to state as my opinion that the improvement in the health and efficiency of this command is due in a large measure—

(1) To the use by the enlisted men of the command, during the whole of the year, of pure drinking water cooled by a liberal supply of ice to make it palatable.

(2) To the suspension of drills and severe fatigue duty during the period of excessive hot weather—that is, from the first of May to the 31st of October of each year.

(3) To the wearing during the hot season of light-weight clothing and straw hats suitable to this almost tropical climate.

(4) To the temperance of the men of the command, due in itself in a large measure to the fact that there is always in the barracks plenty of cool water to refresh them after returning from outside duty; thus avoiding in a large degree the temptation to resort to cool alcoholic stimulants to relieve thirst and fatigue, which so quickly follow exertion in this climate.

(5) To the correction, as far as possible, of every observed sanitary defect of the the post, and

(6) To the deficiency of the annual average precipitation of rain during the last three years.

To these headings may be added the statement that when a soldier is admitted to the post hospital for medical treatment, he is kept under observation until it is believed that he is entirely well and free from the effects of the disease, in order to prevent the possibility of a relapse, no matter what may be the disability, as it has been observed that convalescence is not easily established in sick patients in this climate and extends beyond the period ordinarily considered necessary to restore perfect health in other parts of the country.

VENEREAL DISEASES.

The admission rate for these diseases was 76.73 during the year, the prevalence being somewhat greater among the colored troops and Indians than among the whites. This rate shows, unfortunately, no improvement, the rate of the previous year having been 72.46, and the average annual rate of the previous decade 77.31. The average number of men constantly sick per thousand of strength was 5.33 as against 5.00 for the previous year. Gonorrhea and its results caused 40.90 of the 76.73 admission rates; chancroids, 11.11; syphilis and its results, 16.03, and other venereal diseases, 8.68. The average duration of treatment of each case was 25.4 days; gonorrheal cases, 21.1; chancroidal, 22.7; syphilitic, 38.5, and other cases 25.1 days. Fifty-three men disabled by these diseases were discharged from service during the year.

Columbus Barracks had the highest rates; admission 292.72 and nonefficiency 18.54 per thousand of strength. The improvement noted in last annual report has not been kept up at this recruiting depot. A fall in the rate to 266.20 in 1891 from 380.46 in 1890, and 462.44 in 1889, suggested hope for the future which is not sustained by the rates now recorded. Fort Ringgold, Jackson Barracks, and Fort McPherson follow Columbus Barracks in the relative frequency of their cases, 208.97, 198.11, and 195.48 respectively; but Fort McIntosh takes second place in order of nonefficiency with a rate of 15.47, while Fort McPherson and Jackson Barracks follow with 13.67 and 12.16.

Medical officers at most of the posts affected with these diseases express their inability to suggest measures to control their prevalence where the sources are so plentiful and accessible. The post surgeon at Fort Ringgold undertook to treat the women, but could not prevail upon them to continue until cured. At Forts Custer and Sill recommendation was made to have the affected women removed from the reservation. The post surgeon at Fort McPherson reported that the same men are repeatedly on the sick report from these diseases; that "one man is now in hospital for the fourth time this year with some form of the affection, and he no sooner is returned to duty than he exposes himself again." A man of this character is morally unfit to be a soldier. He is a nuisance in a company and is so regarded by the good men who shun his contact and are suspicious of the bathroom and other conveniences which they have in common. He should not be retained in service. Post surgeons should initiate action in such cases as in those of confirmed inebriates.

ALCOHOLISM.

The admission rate for alcoholism, 37.23 per thousand of strength, is an improvement on the past, comparing favorably with 40.01 in the previous year, 40.73 in 1890, 41.31 in 1889, and 56.68 as the average annual rate of the previous decade. Drunkenness to an extent requiring medical care was relatively more frequent among the white troops than among the negroes and Indians, the rates being respectively 41.19, 8.35, and 1.37. The corresponding rate in the home service army of Great Britain was only 2.69; in the army of Prussia, Saxony, and Würtemberg, 1.65; of Austria-Hungary, 0.11; of Italy, 0.06.

The post having the highest rate was Fort Brady, 179.49; but Jackson Barracks had practically the same rate, 179.23. Eight other posts had the admission rate over 100 per thousand of strength, in the fol-

lowing order, after the two already named: Fort Porter, Willets Point, Rock Island Arsenal, Fort Ontario, Camp Oklahoma and Forts McPherson, Marcy and Barrancas.

The admission rate of the Indian companies does not appear to give full expression to the prevalence of intoxication among them, for the sanitary reports speak occasionally in most unfavorable terms of their habits in this regard. Thus, from Fort Wingate Maj. Matthews reports among them in July one homicide and one death from accident, both results of intoxication, and in December five members of the troop suffering from wounds received in drunken quarrels; while from Fort Bowie Capt. R. W. Johnson reports drunken brawls to be of frequent occurrence, "and if the men were only allowed to retain possession of their arms it would be but a short time before their number would be materially decreased."

RHEUMATISM.

The admission rate, 71.52, continues to show a gradual lessening of the prevalence of rheumatic affections. The rate for the previous year was 75.33; for 1890, 83.19, and the average annual rate of the previous decade, 107.28. Thirty-eight men were discharged for these affections, giving a rate of 1.41 as compared with 1.25 in the previous year, 2.06 in 1890, and 2.96 as the average of the previous decade.

The cases of acute articular rheumatism numbered 124, and constituted 5.12 of the total admission rate, 71.52. The average duration of these cases was 39.4 days. Chronic articular rheumatism constituted 15.37 of the total rate; average duration, 25.3 days. Muscular rheumatism and myalgia formed 51.03 of the total; average duration, 12.2 days.

The highest admission rate, 195.12, was reported from Fort Marcy, N. Mex.; the second, 169.81, from Fort Canby, Wash.; the third 166.18, from Fort Robinson, Nebr.; and the fourth, 162.60, from St. Francis Barracks, Fla. Ten other posts had an admission rate of over 100 per thousand of strength; three in Arizona Territory, and one each in New Mexico, Florida, Montana, South Dakota, Minnesota, Michigan, New York and Virginia. Fort Canby, Wash., had the highest noneffective rate, 11.93; Fort Barrancas, Fla., second, 9.94; Fort Bowie, Ariz., third, 9.76, and Forts Snelling, Minn., Bayard, N. Mex., Yates, N. Dak., and Sully, S. Dak., followed in order.

These statistics, as has been pointed out before in the reports of the Surgeon-General, demonstrate the dependence of these diseases on local rather than climatic conditions. Damp and undrained sites are productive of rheumatism in any climate, and damp clothing or bedding are causative independent of dryness of site or climate. The frequency of attacks in Arizona and New Mexico is undoubtedly owing to carelessness induced by the ordinarily warm and dry climate. Commands take the field unprepared for the rain that occasionally overtakes them or the chilly nights which they have to pass when their service leads them from the plains into the mountains. Even the pleasant coolness of the shade is dangerous in this regard after exercise in the hot sun. Commanding officers can do much toward preventing the development of rheumatic troubles and internal congestions and inflammations by a careful supervision of the equipment of the men and a thoughtful consideration for their well-being.

PULMONARY CONSUMPTION.

The admission rate of the Army for consumption was 4.34 per thousand of strength, considerably in excess of the rate of the previous year, 2.97. The rate recorded by the white troops was 3.27, by the colored troops 4.42, and by the Indians 35.62. The absolute number of cases was 105, of which 70 occurred among the white troops, with 9 deaths and 35 discharges; 9 among the colored troops, with 2 deaths and 3 discharges, and 26 among the Indian companies, with 7 deaths and 13 discharges. The death rate from this cause alone among the Indians, 8.94, was greater than the death rate, 6.44, from all causes in the Army as a whole. Some remarks on the quarters and habits of the Indians, submitted below (p. 103), are of interest in this connection.

PNEUMONIA AND PLEURISY.

Eighty-three cases of pneumonia (not a complication of other diseases) were reported during the year; 72 (16 fatal) among the white troops, 8 (1 fatal) among the colored troops, and 3 (none fatal) among the Indians. The average duration of each case was 31.9 days. Ninety-nine cases were reported in 1891, 96 in 1890, and 130 in 1889, so that this manifestation of disease may be regarded as having touched our military stations but lightly during the past year.

Seventy of the cases, of which 13 were fatal, were reported as lobar; 10 (1 fatal) as catarrhal, and 3 (all fatal) as undefined. The largest number of cases at one post was 10, at Columbus Barracks; Jefferson Barracks and Whipple Barracks had each 5 cases; Forts Assinniboine and Buford, 4 each, and Fort Leavenworth 3. Eighteen posts had each 2 cases, and sixteen each 1 case.

Forty-four cases of pleurisy were reported: White, 37; colored, 4; Indian, 3. Two of the cases among the white troops were fatal.

INJURIES.

The admission rate for injuries, 252.74, or including 49 cases of hernia, usually classed with diseases of the digestive organs, 254.76, differs but little from those of former years. As usual also, contusions and sprains formed about one-half of the whole number of injuries, the average duration of these cases being 8.8 days, as compared with 11.8 days for injuries in general.

Sixty-seven cases of *heat stroke* were reported, 4 among the colored troops, the others among the whites; none fatal. On the other hand, of 66 cases of *frostbite* and *general freezing*, 22 cases, or 10.81 per thousand of strength, occurred among the negroes and only 43, or 2.01 per thousand among the whites; 1 Indian also was frost-bitten. Relatively twice as many cases of *abrasions*, *blisters*, *burns*, and *scalds* were recorded among the Indians as among the other troops, the average rate of the Army for these injuries being 19.58 per thousand men. *Contusions* and *sprains* gave an admission rate of 134.32, and *wounds*, exclusive of gunshot, 55.32; none fatal, but permanent disability resulted in 5 cases of each of these two classes of injuries. Among 62 cases of *dislocation* were included 4 discharged for disability, and among 169 of fracture 4 deaths and 12 discharges. Twenty-one men were discharged on account of *hernia*. Fifty-six violent or accidental deaths were reported, 27 by gunshot, 6 by poison, 11 by drowning, 6 by crushing, 5 by falls, and 1 by freezing. Of the 27 gunshot wounds 16 were suicidal, 5 homicidal,

4 accidental (1 in quarters, 1 while hunting, and 2 at target practice), and 2 shot by sentinels (1 on failure to respond to challenge and 1 while endeavoring to escape from guard). Of the 6 deaths by poison all were suicidal; strychnine was used by 1, opium or morphine by the others. Of the 11 cases of drowning all were accidental so far as known. Of the 6 deaths by crushing, 4 were caused by railroad trains and 2 by loaded wagons. Injury to the brain was the cause of death in all the cases of falling from a height.

Lieut. Alexander N. Stark, assistant surgeon, U.S. Army, reported on the successful employment of Silvester's method of artificial respiration in a case of drowning at Fort Monroe, Va:

> On Monday, June 5, 1893, I was hastily summoned to attend a man who had been rescued with great difficulty while in danger of drowning, and only after several minutes of total submersion. I found the patient pulseless, cold, and without any evidence of respiration, so I immediately began his recuperation by the method advocated by Silvester, of London. First expelling all the ingested water possible by inverting the patient and making abdominal pressure, I began artificial respiration and continued it for thirty minutes without any evidence of success, the condition of the patient remaining unchanged. After several minutes more of exertion I noticed a very feeble radial pulse and other signs of returning animation, and thus encouraged, I redoubled my efforts and soon succeeded in reëstablishing both normal circulation and respiration, though the patient was still in a profound state of unconsciousness. By the use of the ice-water douch, in conjunction with artificial respiration, consciousness soon returned, and the administration of a mixture of warm salt water and whisky, causing copious emesis, the patient was soon out of danger, though very much exhausted.

The 22 cases of suicide that occurred during the year are equivalent to a rate of 0.82 per thousand of strength, as compared with 0.83 during the previous year, and 0.71 the average annual rate of the previous ten years. The last reported rates of foreign armies are: Great Britain, 0.21; Italy, 0.33; Prussia, Saxony, and Würtemberg, 0.64; and Austria-Hungary, 1.18.

Eighteen of the 22 suicides were members of white commands. The causes assigned were domestic troubles in 1, failure to obtain desired promotion in 1, fear of court-martial in 2, mental despondency attributed to ill health in 2, temporary mental aberration in 4, alcohol in 1 and probably in some of the 7 reported as unknown. No case occurred among the colored troops. Four suicides among the members of the Indian companies give a material increase to the rate reported at this time, and detract seriously from that reputation for equanimity, self-restraint, and fortitude with which the American Indian has been so liberally endowed in most of his literary portraits. The reported causes in these cases were in 1, mental depression from syphilis; in 1, homesickness, a pass to visit his tribe having been denied him; and in 2, jealousy and domestic troubles.

One of the 22 suicides was a commissioned officer, 8 belonged to the infantry, 6 to the cavalry, 3 to the artillery, 2 to the ordnance, 1 to the hospital corps, and 2 to other corps. Eleven were 30 to 34 years of age; 4, 20 to 24, and as many 25 to 29; 1 between each of the ages 40 to 44, 45 to 49, and 50 to 54. Seventeen were natives of the United States, 2 German, 1 Irish, 1 French, and 1 Scandinavian. Five were in their first year of service, the others older soldiers. Five of the cases occurred in September, 4 each in October and November, 2 each in March, June, and July, and 1 each in May, August, and December. Three cases were reported from Fort Schuyler, 2 each from Forts Randall and Sam Houston, and 1 from each of fifteen other posts.

INFLUENCE OF SEASON ON THE SICK RATES.

Excluding venereal diseases, alcoholism, vaccina, and injuries as uninfluenced by season, the average monthly rate of admission was 75.31 per thousand of strength. In January the rate was highest, 118.41, from a prevalence of influenza and bronchitic attacks. In February and March the rates dropped to 80.93 and 78.30. During the next four months they fell below the average, 64.63, 67.69, 67.82, and 73.20, rising to 75.97 and 77.24 in August and September, and again dropping during the next three months to 66.36, 64.26, and 69.50. The average nonefficiency was 25.70 per thousand men. For eight months, April to November, inclusive, this rate was below the average. It was highest in January, 34.46; in February, 28.91; in March, 26.80; and in December, 25.91. The lowering during recent years of the rate of malarial fevers has altered the seasonal curves of disease in the Army very sensibly. As may be seen above, the vernal rise from intermittent fever no longer exists, and the wave of prevalence of malarial and diarrheal diseases spreading over August and September is now reduced to relatively small proportions.

INFLUENCE OF AGE, ARM OF SERVICE, NATIVITY, AND LENGTH OF SERVICE ON LIABILITY TO DISEASE.

In the report for the year ending June 30, 1891, was published a series of tables showing for the year the relation of certain specified diseases and classes of disease to arm of service, length of service, country of nativity, and age of the soldiers composing the Army. The rates of admission, nonefficiency, discharge, and death in those tables were necessarily of little value on account of the small number of men under observation in many of the headings, the aggregate of the Army having amounted to only 26,684 officers and men. Nevertheless some interesting points were developed. In the case of typhoid fever, men between 20 and 24 years of age had the highest rate of admission; young officers were more susceptible to attack than enlisted men of the same age, and cavalry officers more than their comrades of the infantry or artillery. From malarial fevers the cavalry suffered more than the other arms; the officers less than the men. The rates for venereal diseases were highest among recruits; higher in the artillery than in the other arms of the service. The rate of alcoholism was highest among the Irish, as was also that of pulmonary consumption, etc.

Appended to the present report is a similar series of tables based upon the statistics of the calendar years 1890, 1891, and 1892. The observations which furnished the data covered a period of three years, but the ratios given are the average annual rates for the period. The change in the personnel of our small Army takes place so rapidly on account of the short term of service, discharge by purchase, desertion, and other drains that the ratios may be regarded as the annual rate of an army of 80,005 men instead of the average annual rate of one of 26,668 men for a period of three years. The tables are therefore of greater value than those formerly published, although the absolute figures under many of the headings are yet too small to be used for the calculation of ratios. A long series of years will be required to obtain rates that will give expression to the relative liability of the various component parts of our Army to specified diseases. The following tabulation concerning the 80,005 men will enable those interested to form an idea of the value to be attached to the rates given in the tables.

At the same time it has a value of its own as showing the constitution of our Army from the several points of view:

Arm of service.	Officers.	Enlisted men.	Per cent.	Arm of service.	Officers.	Enlisted men.	Per cent.
Infantry	2,548	32,629	43.97	Recruits	.....	5,421	6.78
Cavalry	1,272	18,713	24.98	All others	612	2,798	4.26
Artillery	850	9,241	12.61				
Ordnance	173	1,282	1.82	Total	6,352	73,653	100.00
Engineers	346	1,318	2.08		80,005		.....
Medical	551	2,251	3.50				

Age.	Officers.	Enlisted men.	Per cent.	Age.	Officers.	Enlisted men.	Per cent.
19 years and under	.....	1,185	1.48	50 to 54 years	891	951	2.30
20 to 24 years	321	21,504	27.28	55 to 59 years	501	195	.87
25 to 29 years	1,026	21,789	28.52	60 years and over	168	54	.28
30 to 34 years	945	12,924	17.34				
35 to 39 years	958	6,681	9.55	Total	6,352	73,653	100.00
40 to 44 years	735	5,190	7.41		80,005		.....
45 to 49 years	807	3,180	4.98				

Nativities.	Officers.	Enlisted men.	Per cent.	Nativities.	Officers.	Enlisted men.	Per cent.
United States:				Scot	21	654	.84
White	6,025	37,047	53.84	Swiss	6	636	.80
Colored	.....	7,028	8.78	Austrian	3	777	.98
Indian	.....	1,096	1.37	Dane	3	708	.89
				French	12	297	.39
Total	6,025	45,171	63.99	All others	15	1,341	1.71
Irish	132	9,453	11.98				
German	57	8,910	11.21	Total	6,352	73,653	100.00
English	45	2,811	3.57		80,005		.....
Canadian	27	1,395	1.78				
Scandinavian	6	1,500	1.88				

Length of service.	Officers.	Enlisted men.	Per cent.
Under 1 year	120	14,745	7.93
Over 1 year	6,232	58,908	92.07
Total	6,352	73,653	100.00
	80,005		.....

The admissions for all diseases and injuries among these 80,005 officers and men were equivalent to the annual rate of 1,339.51 per thousand of strength. Among officers the rate was only 855.29, as compared with 1,370.81 among the men; in the infantry 1,269.10, but considerably higher in the cavalry, artillery, and engineers. Men between 25 and 29 years gave about the average rate; below this age the rates were higher; above it they were correspondingly reduced. Nativity does not appear to have had much influence in determining this general rate of admission; but, classing the troops by their length of service, it is found that those under one year had a rate of 1,914.42, while those over one year had only 1,205.37.

The nonefficiency or number constantly sick per thousand of strength is the best measure of the sickness affecting military bodies. The average rate of the army was 41.43. Officers, although occasioning fewer admissions than enlisted men, considerably augmented the average rate by the longer duration of their cases. Officers of infantry had a rate of 57.07, of cavalry 67.23, of artillery 55.50. The enlisted men of the cavalry, artillery, engineers and recruits had the rates

3 or 4 units higher than the average; the other corps correspondingly lower.

The most interesting point developed by this inquiry is shown by the rates for the various ages. The nonefficient rate for the period between 25 and 29 years is about the average; it is much higher below 25 years, but beyond 29 years it decreases, being still below the average during the period between 45 and 49 years. Over 50 years the nonefficient is high—54.67 between 50 and 54; 58.04 in the next five years; and 72.42 over 60 years. In regard to age the rates for death and discharge follow in a general way the track of nonefficiency. The average death rate, 7.72, runs up with advancing years to 11.43 between 40 and 44, 13.54 between 45 and 49, and 17.92, 28.74 and 45.05 in the succeeding periods, the average rate of discharge, 21.22, holds good among the men from 25 to 50 years of age; it is higher among younger men, and over 50 becomes doubled, trebled, and quadrupled. It is thus clearly shown that the best service is had from men between 25 and 50 years of age. This has a bearing on such propositions as that of limiting the period of service of the enlisted men to ten years, or that of enlisting only young men for the sake of a military training.

The average admission rate for typhoid fever, 5.06 per thousand of strength, was raised to 7.39 in the cavalry arm. It was 11.07 among men below 20 years of age, and 8.65 in those from 20 to 24; from 25 to 29 the average rate prevailed, but beyond that age the rates fell off, as was to be expected from our knowledge of the influence of age on the susceptibility to this disease. The rate for soldiers under one year of service was double that of their more seasoned comrades. Canadians, Scandinavians, Danes, and Austrians had high rates, due perhaps to the small numbers involved in the calculation.

The young soldiers appear to have been also more susceptible to the attack of influenza. The total number of cases, 8,950, caused an admission rate of 149.49 among men of less than one year of service; 119.05 among the others. So also with measles and mumps, the only other specific febrile diseases that had any notable prevalence; the admission rate for the former among the young soldiers was 20.64, while among the older men it was only 2.53; for the latter the rates were 8.82 and 1.97.

Pulmonary consumption was more prevalent among the engineers than in the other arms of the service; admission rate 4.86, as compared with the Army rate, 3.53. It was relatively more frequent among the men under 20 years of age and in those of less than one year of service. Increased susceptibility appears on the record as affecting those of Scandinavian, Scotch, and French nativity.

The admission rate for pneumonia, 3.88, was exceeded in the ordnance, the cavalry, and among the recruits; also among men under 20 and among those over 45 years of age. The Scandinavians and native Americans appear to have been most susceptible to attack.

Rheumatic affections were of more frequent occurrence in the engineer, ordnance, and cavalry corps than in the Army generally, the rate of admission having been 76.74 for the Army and 91.62, 102.71, and 110.85 respectively for those stated. Men from 30 to 34 years of age had the average rate; younger men suffered less and older men more in proportion to their age, the rate among men from 55 to 59 years having been 170.82. Nonefficiency varied in a similar way from 3.66 per thousand in the Army to 18.38 per thousand among men of the age last mentioned.

Rheumatic fever, however, did not follow the general course. The medical department and recruits suffered most; young men under 20 years and men over 40 suffered more than those of the intervening ages. Swiss, Scandinavians, and Canadians appear from the statistics to have been more susceptible than men of other nativities.

Chronic rheumatism caused relatively more admissions from the ordnance and engineers than from the other corps, and the older the men the greater their susceptibility to attack or recurrence. The discharge rate of the Army on this account was 0.76, but among men from 50 to 54 years it was 4.21, and among those of the next quinquennial period it was as high as 20.51.

Tonsillitis, according to the records, is distinctly a disease of young men. The rate drops to the average at 30 years, and after that susceptibility diminishes rapidly as age increases.

Malarial diseases were of more frequent occurrence in the artillery and cavalry than in the other arms of service; the admission rate of the Army was 73.11; of the artillery, 104.06; of the cavalry, 99.74. Cavalry officers suffered less than their men, but more than the officers of the other corps. Soldiers under 25 years suffered most; after that period of life susceptibility appears to decline.

Diarrheal diseases were much more prevalent among the enlisted men than among officers, and more in the engineers and artillery than among the others. They affected men of all ages, but those under 25 years of age had the largest rates.

Venereal diseases prevailed beyond the average among the recruits and the enlisted men under 30 years of the ordnance and artillery.

Diseases of the respiratory system gave the highest admission rates in the ordnance, artillery, and engineers in young men under 25 and in old men over 50 years of age.

Diseases of the circulatory system were common to all ages, but the rates increased notably after 40 years.

Diseases of the digestive system were as common among officers as among men, and were of more frequent occurrence among the engineers and cavalry than in the other arms of the service. Men under 25 years had the highest rates.

The average admission rate for injury was 248.43; 260.08 among the enlisted men; 68.47 among officers. The cavalry had the highest rate, 356.49; the medical department the lowest, 42.28. Men from 20 to 24 years suffered most, the liability decreasing with age.

INDIAN PRISONERS.

The Apache Indian village at Mount Vernon Barracks, Ala., consists of frame buildings 28 by 28 by 12 feet, arranged in streets on the sides of a central square. The village and its surrounding grounds are thoroughly policed every day and the sweepings removed and burned. The prisoners are well fed, well dressed, and seem contented with their condition. Diarrhea among the children and consumption among the adults have been exceedingly fatal, but improved sanitary conditions are manifesting their influence in the diminished prevalence of these diseases.

CIVILIANS.

Deaths among civilians and their causes are shown in the following table:

Diseases.	Adult males.	Adult females.	Children.	Total.
Acute febrile and infectious diseases	3	.....	24	27
Constitutional	4	6	16	26
Developmental	.....	1	5	6
Nervous system, diseases of	3	15	.....	18
Respiratory	4	16	21	41
Circulatory	2	5	.....	7
Digestive	1	2	25	28
Urinary	3	1	.....	4
Locomotor system	.....	.....	1	1
Integumentary	.....	.....	1	1
Diseases of the nose	.....	1	1	2
Peritonitis	1	4	1	6
Parturition and results	.....	4	.....	4
Total from disease	21	55	95	171
Total from injury	3	3	4	10
Unknown	.....	.....	2	2
Total from all causes	24	58	101	183

MARRIAGES AND BIRTHS.

On the reports were noted 48 marriages, 8 of officers, 37 of enlisted men, 3 of civilian attachés.

The births reported numbered 474—male, 247; female, 227. Eighty-seven were children of officers; 329 of enlisted men; 58 of civilians. Nineteen Indian children, 9 males and 10 females, born at Mount Vernon Barracks, Ala., are included in the total.

List of special reports received from medical officers during the calendar year 1892.

MEDICAL REPORTS.

Name.	Rank.	Report.
Borden, W. C	Captain and asst. surgeon	Bright's disease; death; autopsy.
Byrne, C. B	Major and surgeon	History of specimens sent to Army Medical Museum: (1) Lower end of sternum. (2) Vermiform appendix of unusual length. (3) Kidney; double ureter. (4) Carcinoma of stomach. (5) Stomach; cicatricial contraction of pylorus. (6) Indian skull.
Cleary, P. J. A	do	Tuberculosis, left lung; death; autopsy.
		Tubercular ulceration of large intestine; death; autopsy.
Clendenin, Paul	Captain and asst. surgeon	Disease of the eye; malingering.
		Subacute inflammation of retina.
Egan, P. R	do	Rubeola; 12 thermographs.
Gardner, E. F	do	Paretic dementia.
Girard, A. C	Major and surgeon	Typhoid fever; death; autopsy; thermograph.
		Carcinoma of stomach; death; autopsy.
		Uræmia; death; autopsy.
Harvey, P. F	do	Chronic myelitis; death.
Hoff, J. Van R	do	Chronic dysentery.
Hubbard, V. B	do	Chronic albuminuria; polyuria; death; thermograph.
Kean, J. R	Captain and asst. surgeon	Simple continued fever; thermograph.
		Syphilis.
Kimball, J. P	Major and surgeon	Screw worms (maggots) in nose.
Mason, Charles F	1st lieut. and asst. surgeon	Cutaneous eruptions in influenza.
		Relative to the introduction and spread of epidemic catarrhal fever at Fort Washakie, Wyo.
		Heart disease, tricuspid insufficiency and dilatation of right ventricle and auricle; death; autopsy.
O'Reilly, R. M	Major and surgeon	Typhoid fever; death; thermograph.

List of special reports received from medical officers, etc.—Continued.

MEDICAL REPORTS—Continued.

Name.	Rank.	Report.
Pilcher, James E	Captain and asst. surgeon	Acute catarrhal fever; 4 cases, with thermographs.
		Remittent fever; 2 cases, with thermographs.
Powell, J. L.	do	Malingering.
Rafferty, Ogden	1st lieut. and asst. surgeon	Hepatic abscess, with thermograph.
		Syphilis.
Reed, Walter	Captain and asst. surgeon	Valvular disease of heart; chronic interstitial nephritis; death; autopsy.
		Valvular disease of heart; death; autopsy.
Robinson, S. Q	do	Influenza with eruption.
		Chronic desquamative nephritis; death; thermograph.
Symington, John	Attending surgeon	Variola.
Taylor, B. D	Captain and asst. surgeon	Typhoid fever; death; autopsy; thermograph.
		Typhoid fever; thermograph.
Tesson, L. S.	do	On the fevers at Fort Sidney, Nebr.; 3 thermographs.
Tilton, H. R.	Major and surgeon	Epidemic influenza; heart failure; death; autopsy.
		Mumps; submaxillary gland alone affected.
Turrill, H. S	Captain and asst. surgeon	Variola.
Wakeman, W. J	do	Acute pharyngitis, with destruction of soft parts.
Walters, Fred. G	Hospital steward	Epidemic of pertussis.
Waters, W. E.	Major and surgeon	Pulmonary hemorrhage; death; autopsy.
White, R. H	do	Typhoid fever; thermograph.
		Typhoid fever; thermograph.
Winne, C. K	do	Peritonitis; thermograph.
		Acute peritonitis; thermograph.
		Typhlitis; thermograph.
		Simple continued fever; thermograph.
		Pneumonia; thermograph.
Woodhull, A. A	do	Nephritis; death.
Worthington, J. C	Captain and asst. surgeon	Tuberculosis; right lung.

SURGICAL REPORTS.

Birmingham, H. P	Captain and asst. surgeon	Irreducible umbilical hernia, omental; operation.
Bushnell, G. E	do	Gunshot fracture of tibia.
Cabell, J. M.	do	Amputation at knee joint.
Carter, E. C.	do	Amputation of right leg above the ankle.
Clark, Jos. T.	1st lieut. and asst. surgeon	Severe scald of body; 2 cases, 1 death.
Clendenin, Paul	Captain and asst. surgeon	Alcoholism; found drowned.
Girard, A. C	Major and surgeon	Traumatic epilepsy; insanity.
Glennan, J. D.	1st lieut. and asst. surgeon	Fracture of cervical vertebra.
Gorgas, W. C	Captain and asst. surgeon	Laparotomy; 4 cases.
Happersett, J. C. G	Major and surgeon	Shot wound, thigh.
Harvey, P. F	do	Lacerated wound of scalp.
		Shot wound of bladder; death.
Jarvis, N. S.	Captain and asst. surgeon	Stab wound of back; 2 cases.
Lauderdale, J. V.	Major and surgeon	Lacerated wound, amputation of right arm.
Maus, L. M	do	Rupture of liver; death; autopsy.
Rafferty, Ogden	1st lieut. and asst. surgeon	Cystic sarcoma, left testicle.
Reed, Walter	Captain and asst. surgeon	Shot wound of chest; death; autopsy.
Tilton, H. R	Major and surgeon	Tonic spasms of voluntary muscles, reflex irritation.
		Contusion of right testicle.
Walters, Fred. G	Hospital steward	Fracture of femur.
Wilcox, T. E.	Major and surgeon	Injury of finger, right hand.
Winne, C. K	do	Shot wound, left eye.
Wood, M. W	Captain and asst. surgeon	Shot wound of pelvis.
Woodhull, A. A	Major and surgeon	Motor paralysis of left arm; result of injury.
Worthington, J. C	Captain and asst. surgeon	Shot wound of pelvis.

SURGICAL OPERATIONS.

During the year the Medical Department of the Army reported 197 surgical operations, 70 of which were necessitated by injuries and 127 by disease. The number, character, and results of these are shown in the following statement:

Nature of operation.	Disease or injury.	Total.	Recovered.	Died.	Remarks.
Removal of tumors		**22**			
Enucleation	Sebaceous, 9; encysted, 5; lipoma, 4; fibroid, 1; epithelioma, 1; chalazion, 1; myoma, 1.	22	22	.....	Scalp, 8; face, 7; neck, 4; back, 4; arm, 3; foot, 1.
Opening of abscesses		**11**			
Incision	Chronic, 1; perityphlitic, 1; bursal, 1; adenitis, 1; cellulitis, 1; caries, 1; etc., 5.	11	11	.....	Perineum, 5; neck, 2; groin, 2; abdomen, 1; knee, 1.
Operations on the eye		**6**			
For pterygium		5	5	.....	
Enucleation		1	1	.....	
Operations on the ear		**1**			
Evulsion	Polypus	1	1	.....	
Operations on the nose		**1**			
Excision	Deformed septum	1	1	.....	
Operations on the mouth		**3**			
Removal of tonsils	Tonsillitis, 1; pharyngitis, 1; hypertrophy, 1.	3	3	.....	
Operations on veins		**5**			
For varicocele		4	4	.....	Ligature.
For varicose veins		1	1	.....	Do.
Operations on nerves		**1**			
Stretching	Neuralgia	1	1	.....	Ulnar.
Operations on the respiratory organs.		**2**			
Paracentesis	Pleurisy	2	2	.....	
Operations on the digestive organs.		**19**			
For fistula in ano		4	4	.....	
For fissure of anus		3	3	.....	Incision, 1; dilatation, 2
For hemorrhoids		9	9	.....	Ligation, 6; incision, 3.
For paracentesis	Anasarca, 1; tumors, 2.	3	3	.....	
Operations on the lymphatic glands.		**6**			
Removal of glands	Venereal, 3; adenitis 3.	6	6	.....	
Operations on the urinary organs.		**11**			
For stricture of urethra					
Internal urethrotomy	Gonorrheal, 7	7	7	.....	
External urethrotomy	Chronic cystitis, 1	1	1	.....	
Dilatation	Gonorrheal, 3	3	3	.....	
Operations on generative organs.		**16**			
For phymosis	Syphilitic, 6; gonorrheal, 3; congenital, 3.	12	12	.....	Circumcision.
Testicles	Injury, 2; disease, 2.	4	4	.....	Castration.
Operations on bones		**9**			
Removal of portions	Fracture, 6; necrosis, 3.	9	9	.....	Cranium, 1; maxilla, 1; tibia, 1; metacarpal, 3; phalangeal, 3.
Operations on joints		**27**			
Reduction of dislocations		24	24	.....	Shoulder, 18; elbow, 4; wrist, 1; ankle, 1.
Removal loose bodies		3	3	.....	Knee-joint.
Operations on limbs		**37**			
Amputation for injury:					
Shoulder joint	Shot	1	.....	1	Primary.
Arm	Fracture	2	1	1	Secondary.
Fingers	Shot, 10; injury, 7; frost-bite, 1.	18	18	.....	Primary, 10; secondary, 8.
Thigh	Fracture	2	2	.....	Secondary.
Knee-joint	Fracture	1	1	.....	
Leg	Shot, 2; injury, 3; frostbite, 1.	6	5	1	Primary, 4; secondary, 2.
Toes	Shot, 1; injury, 3	4	4	.....	
Amputation for disease:					
Forearm		1	1	.....	
Finger		2	2	.....	
Operations on muscles and tendons.		**4**			
Tenotomy		2	2		
Sutures		2	2		
Operations on skin, etc		**16**			
Ingrown nails		16	16	.....	
Aggregate		197	.....	.....	

As connected with the surgical work of the year, and of especial interest to military surgeons at this time when a radical change is in progress in the character of the missiles that will produce the gunshot wounds of future battle-fields, I desire to invite attention to the report of a series of experiments conducted at Frankford Arsenal, Pa., by Capt. L. A. LaGarde, in connection with the Ordnance Department of the Army. The weapons used in the experiments were the Springfield rifle, caliber .45, and an experimental Springfield, caliber .30, the former having an initial velocity of 1,301 feet to 500 grains of compressed lead of cylindro-conoidal form, cannelured and lubricated, the latter impressing a velocity of 2,000 feet on a bullet weighing 220 grains, and consisting of lead incased in a jacket of German silver. The penetration of the latter was found to be greater than that of the old arm and bullet at all ranges, and the amount of shock correspondingly less. Explosive effects at short ranges differed but little for the two projectiles, but the explosive zone of the smaller bullet extended to 350 yards, or 100 yards farther than the other. Beyond the limits of the explosive zone the destructive effects of the smaller bullet became less than those of the larger, and this difference was especially noticeable from the 500 to the 1,500 yard ranges, and in the wounds inflicted on the joints and soft parts. The lessened severity of wounds at these ranges is attributed in part to the small amount of flattening or other deformation found in the jacketed bullet after impact even with bone. At longer ranges, where velocity became lessened, the small bullet again produced extensive comminution of bones and disorganization of soft parts, attributed to a sideways impingement. Dr. LaGarde's experiments show that the heat imparted to a projectile by the ignition of the powder, the resistance in the barrel, etc., has been much exaggerated. It is certainly insufficient to render a bullet aseptic. Lesions in wounds can not be attributed in any way to the heat imparted by the bullet, but they may be caused by septic infection before firing. Of the jacketed missiles the cupro-nickeled steel bullet is certainly the best, as its mantle does not part from its nucleus on impact with bone. As its penetration is not lessened by deformation its military efficiency is greater than that of other missiles; and while it is capable of disabling more men than a bullet, which becomes impaired in form, the wounds occasioned by it are less destructive to the individual.

REPORT OF CAPT. L. A. LAGARDE.

In accordance with a manuscript order dated Adjutant-General's Office, Washington, D. C., July 20, 1892, which directs me to proceed to Frankford Arsenal, Pa., for the purpose of conducting, in connection with the Ordnance Department of the Army, certain experiments touching upon the "effects of small-arm firing with new calibers and velocities on the human frame," I have the honor to report as follows:

In order to make the results more apparent we followed the plan of—

(1) Noting the effects of a projectile of larger caliber and lower velocities upon different parts of the human body at various ranges.

(2) Noting the effects of the projectile of the smaller caliber and greater velocities upon similar parts of the human body, or parts offering about the same resistance at similar ranges.

The larger caliber weapon selected was the Springfield rifle, caliber .45, the gun which has formed the armament of our foot troops since 1874. The smaller caliber weapon furnished, and to which our experiments were especially directed, is known as the Experimental Springfield rifle, caliber .30.

The following is a description of the more important ballistic properties of these weapons, as kindly furnished by authority of the Chief of Ordnance, U. S. Army.

"The Springfield rifle is a .45 caliber gun, the projectile of which has an initial velocity of 1,301 foot seconds. Its projectile is made of compressed lead, cylindro-conoidal, cannelured and lubricated, weighing 500 grains, impressed by 70 grains of black rifle powder.

"The Experimental Springfield rifle is a .30 caliber gun, the projectile of which has an initial velocity of 2,000 foot seconds. Its projectile is made of a German silver jacket filled with a core of lead, and is not cannelured or lubricated."

The velocity and energy of the projectiles of the two weapons at different ranges are as follows:

Velocities of the projectiles of the two guns.

Name and caliber of weapon.	Initial velocity.	500 yards.	1,000 yards.	1,500 yards.	2,000 yards.
	f. s.				
Springfield, caliber .45	1,301	873	676	531	429
Experimental Springfield, caliber .30	2,000	1,103	804	627	495

Energy of the projectiles.

[In foot pounds.]

Name and caliber of weapon.	Initial velocity.	Weight.	Muzzle.	500 yards.	1,000 yards.	1,500 yards.	2,000 yards.
	f. s.	*Grains.*					
Springfield, caliber .45	1,301	500	1,879	846	507	313	204
Experimental Springfield, caliber .30	2,000	220	1,954	594	315	192	120

It will be seen by the first table that the initial velocity of the smaller caliber projectile is far greater than of the larger caliber, and that the striking velocity at all the ranges is greater.

The penetrations of bullets are proportional to the squares of their striking velocities, for equal velocities the penetration is proportional to the density of section. The form of the bullet and its power to resist deformation have a powerful influence. The penetration of the 220 grain bullet is greater at all ranges.

This quality of penetration in projectiles is always of great interest to surgeons, and it becomes especially so in this instance, since it depends to a material extent, as far as the human body is concerned, upon the almost indestructible hardness of the projectile.

From the experiments which have been conducted at Frankford Arsenal, to be described in detail later on, we are warranted in stating that the penetration of the projectile of the Experimental Springfield rifle is equal to that possessed by the projectiles belonging to the small caliber rifles now used by all the foreign powers. Chauvel and Nimier, Traité Pratique de Chirurgie d'Armée, 1890, state as a result of extensive experiments with the Lebel, the portable gun of the French army, that "its projectile has velocity and penetration sufficient to make it redoubtable for the human body at 2,775 yards."

The penetration at the different ranges was obtained as follows: A Le Boulengé chronograph was used—the distance between first and second targets being 100 feet and the first target being 3 feet from the muzzle. Thus the velocity recorded was that at 53 feet from the muzzle. The remaining velocities of both bullets used (500 grains, .45 caliber, and 220 grains, .30 caliber) were computed for the desired ranges by the methods given in Ingall's Exterior Ballistics. To find the penetration at a given range, say 1,000 yards, the procedure was as follows: The remaining velocity at this range computed as above, was found to be 676 foot seconds for the 500-grain bullet. The charge of powder was successively reduced until a charge was found which gave at 53 feet from the muzzle a velocity of 676 foot seconds. Cartridges were made up with this charge, and the cadaver to be fired at was placed at 53 feet from the muzzle. The striking velocity of the bullet being the same as that of a bullet fired with the full charge and striking an object at 1,000 yards distance the penetration would also be the same. At the ranges (1,500 and 2,000 yards) it was found necessary, in order to record the low velocities obtained, to reduce the distance between targets to 50 feet, which caused the velocity to be determined at 28 feet from the muzzle. At these ranges, therefore, the cadavers were placed 28 feet from the muzzle. A tackle was provided for traversing the cadavers and bringing the portion of the body to be fired at into proper position. Barrels filled with sawdust were placed behind the cadaver experimented with, to catch the bullets and preserve them from deformation other than that received in their passage through the body. Each bullet was

marked on its base with a number or letter, for the purpose of identification, and after firing at each range the bullets were collected.

Before proceeding with the notes upon the gunshot injuries observed, I wish to give some facts upon the subjects of impact and explosive effects by the projectiles of the two weapons.

Impact.—The shock as shown by the oscillation of the limb, when a resistant bone was hit, was always greater with the leaden bullet of .45 caliber than that of the smaller bore gun; on the other hand, the difference was reduced to a minimum, when the soft parts alone were hit. It often happens that the occurrence of a fracture by the smaller projectile was determined only after a careful examination of the wound. This difference in shock was noted at all the ranges, but especially so after the 500 yards range.

The minimum amount of shock for the smaller projectile depends upon the superior penetration, which, as stated already, is due to its smaller caliber, greater velocity, and last, but not least, the fact that it preserves its shape unaltered. The fact that the caliber alone of the .45 caliber Springfield was greater, would be cause sufficient for a greater amount of shock upon impact; since, however, deformation is the first thing that happens, when the leaden bullet collides with a resistant bone, part of the energy is consumed in the flattening, and the rest is conveyed to the part struck in the form of shock. The difference in the amount of shock is at once suggested in table No. 2, already cited. It will be seen that the striking energy in foot pounds for all the ranges is greater with the projectile of the .45 caliber Springfield rifle. Delorme and Chavasse, who have experimented a great deal with the 8 m. m. gun of the French army, while commenting upon similar experience, express the opinion that the general as well as the local shock will be less with the new projectiles having metallic mantles.

Explosive effects.—The explosive effects caused by the projectile of the Springfield rifle were noticed up to 200, and in some instances to 250 yards, whilst the explosive effects of the projectile of the experimental Springfield rifle extended in some instances as far as the 350 yards range.

The term "explosive effects" is somewhat confusing, as it is apt to convey the idea that the wound was caused by an explosive bullet. It is a term that doubtless owes its origin to the similarity in the appearance of the two wounds. When we say that a wound shows explosive effects, we mean that it appears as though it had been caused by an explosive bullet. There are no special features as a rule to describe about the wound of entrance, except the appearance at times of bony sand in the tract leading to a fractured bone. When a resistant bone has been hit, the foyer of fracture will show great loss of substance, the bone will have been very finely comminuted, the pulverized bone will have been driven not only in the direction in which the projectile was traveling, but in all directions, and the pulpification of the soft parts will not only be limited to the track of the bullet, but the utter destruction is noticed some distance into the tissues. The wound of exit appears like a bursting forth of the skin; the track leading to the bone is conical in shape, the base of the cone corresponding to the wound of exit in the skin and the apex to the seat of fracture.

The degree of explosive effects corresponds to the velocity of the projectile at the moment of impact, and the resistance offered by the part hit.

The bony structures are not alone in showing explosive effects with high velocities. In a recent lecture Dr. Johann Habart, royal and imperial regimental surgeon of the Austrian army, states that he found explosive effects with the projectile of the new Mauser up to 500 m. in "very vascular tissues, cavities filled with liquid or semi-liquid or viscous masses, such as the skull, heart, liver, spleen, kidneys, stomach, intestines, and bladder, which have been attributed by some observers to hydraulic pressure."

In order to test the influence of hydraulic pressure in causing explosive effects, some interesting experiments were conducted at Frankford Arsenal.

1. Empty powder cans were fired into at various ranges. The orifices of entrance and exit were found proportional to the size of the projectiles employed. The cans were not deformed—showed no explosive effects.

2. A half dozen or more powder cans from the same lot were filled with wet sawdust. The cans were fired into at various ranges. The orifice of entrance in each case presented no special features. The orifice of exit, however, for both projectiles was marked by a bursting forth of the tin and loss of the contents. The cans had expanded as if by an internal force, which had been exerted in all directions. The explosive effects were about the same for both bullets.

3. Another lot of powder cans of the same size and dimensions was filled with water and fired into. The results were quite similar to those found with the wet sawdust, only more extensive, and they were about equal for the two projectiles.

Notes of gunshot injuries on the human body, conducted at Frankford Arsenal, Pa., on March 18, 1893, with the large and small caliber projectiles, for the purpose of noting the explosive effects at relatively short ranges.

I. Gunshot injury, left humerus, at junction of middle and lower thirds; bullet, No. 4, caliber .45; range, 17 yards. The wound of entrance is oval, 0.55 inch in its greatest diameter. The wound of exit is marked by a chasm on the back of the arm 4 inches in length, 2.36 inches in width, the edges of which are ragged. There is eversion of muscle and fat. The soft parts contain minute fragments of bone, which have been driven some distance into the tissues. The bullet struck the humerus at the junction of the middle and lower thirds. The foyer of fracture shows a loss of substance of the shaft 1.60 inches in length. There is extensive comminution. The fragments (twenty-three being readily counted) are greatly displaced, and the majority of them are free from the periosteum. The bullet is very much mushroomed, having lost about one-half in weight.

II. A gunshot injury by the .30-caliber projectile, at the same range, on the opposite arm produced a wound of entrance which is round, 0.35 inch in diameter. The wound of exit is 4.30 inches in length and 2.36 inches in width. It is marked by pulpification of the muscles, which contain bony sand. The missile struck the shaft of the humerus above the middle, comminuting the bone extensively, but not to the extent observed in the preceding injury with the .45-caliber leaden projectile. Fourteen principal fragments were readily counted. They are large, and not so much displaced as in the injury on the left humerus. The larger fragments are retained in place by their periosteal attachment. The fissures are not so extensive in the shaft above and below the seat of injury. The projectile was recovered, the leaden nucleus having escaped from the harder metallic mantle. The cylindrical part of the envelope is intact, the conical end having split in four pieces, one of which is entirely detached from the shell.

III. Gunshot injury of the left tibia, middle third; bullet No. 5, caliber .45; range, 17 yards. The wound of entrance is round, 0.45 inch in diameter; the wound of exit is marked by a longitudinal tear in the calf 3.16 inches in length and 1.18 inches in width. The bullet struck the shaft of the tibia at the junction of the middle and upper thirds, shattering the bone extensively. The seat of comminution measures 4.30 inches; the fragments, which are all detached, have been displaced backward. Large numbers of fine spiculæ of bone have been driven into the muscle of the calf. The soft parts are reduced to a pulp-like mass some distance beyond the walls of the chasm like opening. The fibula is broken at the same level. The projectile was split into two lateral halves at the conical end, one of which was lost, whilst the other remains attached to the cylindrical portion.

IV. A gunshot injury by the .30-caliber projectile at the same range on the opposite tibia shows a wound of entrance which is round, 0.30 inch in diameter, and a wound of exit which is marked by an oblique tear extending from the lower part of the popliteal space to the lower part of the calf, measuring 6.66 inches in length and 2.36 inches in width.

The bullet collided with the tibia at its inner border 4.30 inches below the knee-joint, comminuting the shaft. Upon removing the skin the wound of entrance is seen to be filled with bony sand, the periosteum over the crest of the shaft is partly torn; on the outer side several large, sharp splinters of bone remain attached to the periosteum; the posterior wall of the shaft below the popliteal space, 2 inches in extent vertically, has been entirely destroyed and spiculæ of bone and medulla are seen in the lacerated muscle of the calf. The fibula is fractured in two places just above the level of the fracture in the tibia. The muscle of the calf has been reduced to pulp.

The projectile was very much deformed; but one fragment of the metallic mantle was recovered, measuring 0.79 inch in length and 0.39 inch in width. The leaden nucleus was mushroomed and is only half the original length.

It will be seen from the foregoing that the explosive effects at short range differ but little for the two projectiles, and that they are always enormous.

Notes on the effects of the projectiles of large and small caliber impressed by the velocity possessed at 100 yards, on the human body, conducted at Frankford Arsenal, Pa., January 10, 1893.

I. Gun-shot injury of the lower part of the left femur; bullet No. 4, caliber .45; soft parts frozen. The wound of entrance is marked by a V-shaped tear, each side of the V being 2.75 inches in length; the wound of exit is round; 1.57 inches in diameter. It is funnel-shaped, the base of the funnel corresponding to the skin, and the apex to the point of destruction in the bone. The soft parts adjacent to the track of the bullet are a pulpified mass mixed with finely pulverized bone. One and a half inches of the external half of the shaft immediately above the articular surface have

been carried away. The remaining part of the shaft is separated from the articular surface by a transverse fissure, whilst an oblique fissure extends into the shaft above, 2.75 inches in length. The upper and external quadrant of the patella was chipped. Strange as it may seem, there is no fissuring into the joint. The bullet was mushroomed and bent to one side.

II. Gunshot injury of the right femur; bullet No. 3, caliber .30. The soft parts were frozen, on account of which the explosive effects at the wounds of entrance and exit were enormous. The projectile entered the femur just above the epiphyseal junction of the internal condyle and emerged posteriorly on a horizontal line, making an orifice 0.28 inch in diameter upon entering, and 0.39 inch in diameter upon leaving the bone. The track of the bullet in the bone and between the point of leaving the bone and the wound of exit is lined with bony sand. There is a fissure scarcely visible to the naked eye running downwards and from before backwards through the articular surface, separating the two condyles almost equally. There is also a subperiosteal fissure 1.57 inches long running upwards from the point of emergence in the bone. There are a few small splinters of bone near the wound of exit still attached to the periosteum. The projectile was not deformed.

III. Gunshot injury of the upper third of the right femur; bullet No. 6, caliber .45. The wound of entrance is round, 0.47 inch in diameter; the wound of exit is ragged, quadrilaterally shaped, 0.79 inch in its longest diameter. The track of the wound from the bone posteriorly to the wound of exit is one pulpified mass, in which are found bony sand and many free splinters of bone. There are a number of fissures in the ends of the broken shaft; the longest in the upper fragment is 3.54 inches, extending to the anatomical neck. The projectile was very much set up.

IV. Gunshot injury of the left humerus at the junction of the middle and upper thirds; bullet No. 8, caliber .45. The wound of entrance is round, 0.47 inch in diameter; the wound of exit is marked by a longitudinal tear, 3.15 inches long. The track of the wound between the posterior surface of the bone and the wound of exit contains a number of free splinters of bone. The lower fragment of the shaft shows one longitudinal fissure, 3.54 inches in length; the upper fragment has two longitudinal fissures, the larger being 1.57 inches in length. The projectile is mushroomed.

V. Gunshot injury of the middle third of the right humerus; bullet No. 9, caliber .30. The wound of entrance is round, 0.28 inch in diameter; the wound of exit is marked by a longitudinal slit, 1.18 inches in length. The bone is fractured by a number of longitudinal and transverse fissures. The fragments, which are five in number, vary from 0.39 to 1.57 inches in diameter, and though separated from the periosteum on the shaft above and below the seat of injury they remain in situ. It is not possible to locate the point of impact, and the fracture appears to have been caused by concussion. The bullet is not in the least deformed.

Notes on the effects of the projectiles of large and small caliber impressed by the velocity possessed at 150 yards, on the human body, conducted at Frankford Arsenal, Pa., January 10, 1893.

I. Gunshot injury of the middle third of the left tibia and fibula; bullet No. 2, caliber .45. The wound of entrance is oval, 0.51 inch in its greatest diameter; the wound of exit forms a chasm in the calf, showing great destruction of the soft parts and a bursting forth of the skin, 5.91 inches in the longitudinal and 3.15 inches in the transverse diameter. The wall of the chasm is lined with bony sand and four free splinters are found near the surface, the largest being 1.57 inches in length. The fibula was fractured on a level with the seat of injury in the tibia. The bullet is mushroomed.

II. Gunshot injury of the middle third of the left tibia and fibula; bullet No. 1, caliber .30. The wound of entrance is round, of the same diameter as that of the missile; the wound of exit is triangular in shape, the apex of the triangle ending in a longitudinal tear, which extends 3.54 inches in the lower part of the calf. The space between the posterior surface of bone and the wound of exit contains no fragments; the fragments at the seat of the fracture are small, with one exception, and attached to the periosteum. The exception referred to is a splinter, 3.94 inches long, 0.79 inch wide, composed of crest of tibia. The bullet was bent upon itself, and slightly flattened at the conical end.

III. Gunshot injury of the lower third of the right femur; bullet No. 3, caliber .45. The wound of entrance is round, and it is similar in diameter to the diameter of the missile; the wound of exit is triangular, 1.18 inches in length; the projectile carried away the inner tuberosity, striking 0.79 inch above the articular surface in front, guttering the bone, causing no fissuring in the joint nor in the compact structure above, excepting in the popliteal space for a distance of 0.79 inch above the internal condyle and extending nearly to the outer condyloid notch. The space between the posterior surface of the femur and the wound of exit contains finely

pulverized bone. The bullet is slightly impressed on one side at the conical end, otherwise it is not deformed.

IV. Gunshot injury of the lower third of the right humerus into the elbow joint; bullet No. 9, caliber .30. The wound of entrance is round, 0.31 inch in diameter; the wound of exit is 1.18 inches above and internal to the tip of the olecranon It is marked by a longitudinal tear, 0.79 inch in length. The projectile shattered the lower part of the shaft immediately above the spongy structure, fissuring the articular surfaces extensively into the elbow joint. The splinters were all free from the periosteum covering the shaft. The bullet was not deformed.

V. Gunshot injury of the middle of the left femur; bullet No. 5, caliber .45. The wound of entrance is round, 0.43 inch in diameter; the wound of exit is marked by a longitudinal slit at the posterior aspect of the thigh. 3.15 inches long, through which a mass of muscle protrudes as large as a man's fist. The track of the bullet between the posterior surface of the femur and the wound of exit is a pulpified mass mixed with bony sand, and a number of free splinters, one of which is 2.36 inches in length. The shaft above and below the seat of injury is extensively fissured, one of the fissures in the upper fragment measuring 1.97 inches in length. Aside from the longitudinal slit in the skin which marks the principal wound of exit there are two perforations internally thereto; the first has ragged edges, 0.39 inch in length, 0.31 inch in width; internal to this, in the same horizontal plane, appears the second perforation, 0.31 inch long, 0.35 inch wide. These perforations appear to have been inflicted by pieces of detached lead or fragments of bone, driven forth at the moment of impact, each acting the part of a projectile. The bullet was mushroomed.

VI. Gunshot injury of the lower part of the left humerus into the elbow joint; bullet No. 6, caliber. 45. The wound of entrance is marked by a longitudinal slit, 0.79 inch in length; the wound of exit measures 1.57 inches in its widest part; it is funnel shaped, with the base of the funnel corresponding to the skin. The humerus was fractured just above the articular surface, comminuting the bone in the joint. The bullet was very much deformed laterally, being notched as if it had wrapped round a bone on impact.

VII. Gunshot injury of the left shoulder joint; bullet No. 7, caliber .30. The wound of entrance is oval, 0.51 inch in its greatest diameter. The wound of exit is round and equal to the diameter of the projectile. The bullet entered at the epiphyseal junction, separating the anatomical from the surgical neck; there is slight comminution in the joint; the shaft shows a fissure, 1.18 inches in length; there are a number of splinters adherent to the periosteum. The bullet was set up and slightly bent to one side. The tip of the conical end was driven in, making a concavity where it was convex before.

Notes on the effects of the projectiles of large and small caliber impressed by the velocity common at the range of 250 yards, on the human body, conducted at Frankford Arsenal, Pa., January 11, 1893.

I. Gunshot injury of the lower third of the left tibia; bullet No. 1, caliber .45. The wound of entrance is round, 0.43 inch in diameter. The wound of exit is in the posterior and external aspect of the lower part of the calf, marked by a longitudinal slit, which is gaping, with muscle and tendon protruding. The extreme length of the slit is 3.74 inches, and the width is 1.57 inches. The track of the bullet from the posterior surface of the bone to the wound of exit is lined by bony sand. There are nine loose splinters of bone, varying from 2.18 inches to 0.24 inch in length, and three more splinters, the largest being 1.18 inches in length, attached to the periosteum, covering the upper fragment. The fibula is fractured at the same level. The bullet was set up and bent upon its long axis.

II. Gunshot injury of the right ankle; bullet No. 1, caliber .30. The wound of entrance is 0.28 inch in diameter, 1.57 inches above and posterior to the external malleolus; the wound of exit is marked by a tear 0.35 inch long, 0.20 inch in width, 0.79 inch below the internal malleolus. The bullet entered the external aspect of the astragalus, fracturing it into four fragments. The tibia and fibula were not injured. Projectile not deformed.

III. Gunshot injury left knee joint; bullet No. 2, caliber .45. The wound of entrance is directly over the patella, 0.45 inch in diameter; the wound of exit is in the upper part of the popliteal space and as large as the thumb nail. The missile struck the center of the patella, making a radiating fracture with pulverization of the lower half of the bone. The missile traversed the lower end of the femur, entering midway between the condyles, 1.18 inches above the lower margin of the bone. The foyer of fracture is filled with innumerable splinters of bone, some of which are attached to, whilst others are free from, the periosteum. Both condyles are separated from the shaft, the outer fragment being 3.94 inches in length. The projectile was not recovered.

IV. Gunshot injury of the head of the right tibia; bullet No. 3, caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is in the popliteal space at the bend of the knee, and slightly internal to the mesial line. It has a punched-out appearance, and there is a valvular piece of skin fitting over the opening, which scarcely exceeds the diameter of the projectile. The bullet entered the bone 0.98 inch below and internal to the tuberosity of the tibia, and emerged 1.38 inches below the posterior margin of the articular surface. The track of the bullet in the bone and in the soft parts from the posterior surface of the bone to the wound of exit is lined with bony sand. The projectile perforated the bone without causing a solution of continuity. There is a fissure 2.76 inches in length extending in the shaft below. The projectile was recovered unaltered.

V. Gunshot injury of the right hip joint; bullet No. 4, caliber .30. The wound of entrance is round, 0.30 inch in diameter, 0.39 inch below Poupart's ligament, and 2.95 inches from the anterior superior spine of the ilium; the wound of exit is in the upper part of the gluteal region and internal to its middle. It is slightly irregular and scarcely exceeds the diameter of the missile. The projectile penetrated the acetabulum at its deepest portion, and furrowed the head of the femur at the attachment of the ligamentum teres; otherwise the bone is not injured. The point of entry is at the brim of the pelvis, 0.39 inch distant from the margin of the acetabulum. Three splinters of bone belonging to the brim of the pelvis and partly stripped of periosteum were found in the soft parts overlying the brim of the pelvis. The bullet, which was not in the least deformed, emerged midway between the ischium and sacrum in the great sciatic notch.

VI. Gunshot injury of the radius and ulna of the left side; bullet No. 6, caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is below and external to the olecranon; it is irregular, 0.43 inch in diameter. On removing the skin and muscle the head of the radius is found detached and split through the articular surface into two very nearly equal halves. The projectile struck the ulna and lesser sigmoid cavity, splitting the bone into three fragments. The fracture through the head of the radius is finely comminuted. No fissuring into the elbow joint. The projectile was dented on one side at the conical end.

VII. Gunshot injury of the right elbow joint; bullet No. 7, caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is distinguished by a longitudinal tear 2.76 inches in length 0.79 inch below the tip of the olecranon. The coronoid process of the ulna and the olecranon are comminuted into the joint. The projectile was slightly flattened at the conical end.

VIII. Gunshot injury of the lower third of the left humerus; bullet No. 4, caliber .45. The wound of entrance is 2.76 inches above the elbow joint; it is round, 0.43 inch in diameter; the wound of exit is marked by a longitudinal tear 2.36 inches long, and the foyer of destruction is marked by a chasm 1.57 inches in its greatest diameter. The deep fasciæ are extensively lacerated. The track of the projectile is lined with bony sand, and eleven free splinters of bone are found in the wound. The projectile was not recovered.

IX. Gunshot injury of the left shoulder joint; bullet No. 6, caliber .45. The wound of entrance is round, 0.45 inch in diameter; the wound of exit is irregular, with torn edges, 1.18 inches in its greatest diameter. The projectile passed through the upper and outer portion of the head of the humerus, separating entirely the head from the shaft at the junction of the surgical and anatomical necks. The wound is full of finely pulverized débris; one fragment, 0.30 inch in length, remains attached to the periosteum. There are two fissures on the outer surface, the longest one being 2.50 inches down the shaft. The projectile was not recovered.

X. Gunshot injury of the right humerus at the surgical neck; bullet No. 8, caliber .30. The wound of entrance is 0.30 inch in diameter; the wound of exit is crescentic in shape, 0.39 inch in its greatest diameter. The projectile passed through the surgical neck just anterior to the bicipital groove, and emerged at the lower margin of the anatomical neck. The track of the projectile at the seat of fracture and from the posterior surface of the bone to the wound of exit is marked by the presence of innumerable small splinters of bone and bony sand. The shaft of the humerus is fractured obliquely; the lowest portion of the upper fragment is 2.95 inches below the upper margin of the greater tuberosity. The projectile is flattened obliquely at the conical end.

XI. Gunshot injury of the skull; bullet No. 7, caliber .30. The projectile entered the left eye near the outer canthus, perforating the eyeball; ranging backwards it made its exit through the scalp on a line running horizontally from the external auditory meatus of the corresponding side, 3.15 inches posterior thereto. The wound of exit is a bursting forth of the skin, irregularly quadrilateral in shape, 0.98 inch in its greatest diameter. Near the wound of exit on the inside of the scalp a number of small particles of lead were found, showing that the nucleus of the projectile had parted from the metallic envelope. The track of the wound near the point of

exit contains many minute fragments of the occipital bone. Near the wound of entrance the outer margin of the orbit is found to contain three small splinters of bone from 0.07 to 0.31 inch in length, attached to the periosteum; there is a fracture of the external portion of the supra-orbital ridge; periosteum partly torn. There is a fracture of the left parietal bone, entirely covered by periosteum, except near the occiput. The mastoid portion of the temporal bone is depressed 0.39 inch, the apex pointing upward. The base of the skull is extensively fissured. There is also a fracture of the left ramus of the lower jaw. The projectile was lost.

XII. Gunshot injury of the left shoulder joint; bullet marked "O," caliber .45. The wound of entrance is round, 0.45 inch in diameter; there are eleven slight rents in the skin radiating from the circular edge of the wound; the wound of exit is irregular, 0.59 inch in its greatest diameter. The bullet has a number of irregular impressions at the conical end, and it is slightly dented at the cylindrical portion near the base.

XIII. Gunshot injury of the skull; bullet No. 8, caliber .45. The wound of entrance is 2.17 inches above the middle of the right orbit. The explosive effects were so great as the bullet perforated the skull from before backward that the skull cap was literally blown to pieces. It is difficult on account of the great destructive effects to state even approximately the point where the bullet emerged from the skull posteriorly. The bullet is very much deformed at the conical end, flattened in the cylindrical portion near the base, and bent.

Notes on the effects of the projectiles of large and small caliber impressed by the velocity common at 350 yards on the human body, conducted at Frankford Arsenal, Pennsylvania, January 12, 1893.

I. Gunshot injury of the left ankle; bullet No. 2, caliber .30. The wound of entrance is 1.18 inches below the tip end of the internal malleolus; it is round. 0.30 inch in diameter; the wound of exit is at the tip end of the external malleolus; it is star-shaped, 0.39 inch in its greatest diameter. The projectile entered the astragalus at its lower margin and at its articulation with the os calcis. A portion of the bone belonging to the astragalus at this point, 0.59 inch long by 0.39 inch wide, is lying in the wound, attached by periosteum. The posterior portion of the trochlear surface of the os calcis, 0.59 inch long, 0.39 inch wide, is partially detached. The missile passed between the os calcis and the astragalus and emerged through the upper portion of the os calcis next to the outer margin of the articulation. There are several free fragments from the latter bone in the wound of exit. The tip of the external malleolus was crushed by the projectile. The projectile was not deformed.

II. Gunshot injury of the left ankle joint; bullet No. 3, caliber .45. The wound of entrance is round, 3.54 inches in diameter, and torn, the tears radiating from the edges of the wound. The wound of exit is irregularly quadrilateral in shape, 0.79 inch in its greatest diameter. The bullet entered through the internal malleolus and made a grooved fracture of the astragalus; there is complete pulverization of the inner half of the articular surface of the tibia. The missile then passed out, piercing the posterior portion of the external malleolus, the anterior portion remaining attached to the shaft. The projectile was mushroomed.

III. Gunshot injury of the right foot; bullet No. 4, caliber .30. The wound of entrance is 0.35 inch in diameter, 1.18 inches in front of the external malleolus. The wound of exit is located, after several minutes of patient searching, in the sole of the foot, 1.38 inches from the internal malleolus. It is marked by a slit-like opening 0.28 inch in length. The edges of the slit approximate each other thoroughly, hence the difficulty experienced in locating the wound. The projectile entered the os calcis near its articulation with the cuboid and below the head of the astragalus, fracturing the calcaneo-cuboid articulation, splintering the bone in three fragments, near which a small amount of pulverized bone is found. All the bones of the tarsus are intact except the os calcis. The projectile was recovered unaltered in shape.

IV. Gunshot injury of the left tibia and fibula near knee joint; bullet No. 5, caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is marked by a longitudinal slit, measuring 0.39 inch in length. The projectile entered the anterior portion of the head of the tibia, 0.39 inch from the joint, in the middle line, passing obliquely toward the outer side, emerged from the posterior surface of the head of the fibula. The orifice of entrance in the bone is equivalent to the diameter of the missile; the orifice of exit is irregular, 0.39 inch in its greatest diameter. There is no comminution of bone. The knee joint was not perforated, but the articular surface adjacent to the outer tuberosity shows a fissure which in the recent state was not apparent. The projectile was lost.

V. Gunshot injury of the lower shaft of the right femur; bullet No. 3, caliber .45. The wound of entrance is 1.57 inches above the outer condyle, round, and 0.45 inch in diameter. The wound of exit is in the upper part of the popliteal space, irregu-

larly quadrilateral in shape, 0.79 inch in its greatest diameter. The bullet entered the lower shaft, 1.57 inches above the margin of the articular surface, 0.39 inch outside the middle line. Nine large splinters are detached, measuring from 0.6 inch to 3.50 inches in length. There are a number of deep vertical fissures in the upper and lower fragments; those in the lower do not invade the joint. The projectile was very much set up.

VI. Gunshot injury of the right hip joint. Bullet No. 6, caliber .30. The wound of entrance is 0.35 inch in diameter, over the femoral vessels, 1.57 inches below Poupart's ligament; the wound of exit is in the middle of the gluteal region of the corresponding side, oval in shape, and exceeds very little the diameter of the projectile. The bullet entered the capsular ligament at its inner margin and traversed the head of the femur, 0.79 inch below the ligamentum teres, producing a grooved fracture. The course of the projectile was horizontal and clear-cut; a fracture, 1.57 inches in length, is noticed extending downwards through the ischium. The compact bone adjacent to the track of the bullet shows fissures not apparent in the fresh state. The missile entered the acetabulum, 1.97 inches from the lower margin in the cotyloid notch. Orifice of entrance corresponds nearly to the diameter of the projectile; the orifice of exit is irregular, 1.97 inches in its two diameters. A fragment of the outer plate of bone, 0.39 inch in length, hangs attached by periosteum. The projectile was not in the least deformed.

VII. Gunshot injury of the left hip joint; bullet No. 7, caliber .30. The wound of entrance perforated the skin on the anterior aspect of the thigh, external to the large vessels, 1.57 inches below Poupart's ligament. The wound of entrance is round, 0.30 inches in diameter; the wound of exit is also round, in the middle of the gluteal region, and it barely exceeds the diameter of the missile. The projectile entered the anterior convexity of the head of the femur, after passing through the capsular ligament; the acetabulum was not involved until after passing through the head of the femur. The projectile traversed the head of the femur in a horizontal direction, 0.39 inch above a horizontal line drawn through the center of the head, and emerged at its posterior surface, 1.28 inches external to the ligamentum teres. A fissure is seen connecting the points of entrance and exit, and extending outwards along the upper margin of the attachment of the capsular ligament; there are smaller fissures, radiating from the orifice of entrance. No splinters are detached. The outer lip of the acetabulum, however, was split, and is held in place only by the capsular ligament. The bullet at the orifice of exit penetrated the acetabulum, 0.59 inch from the outer margin, emerging without detaching any splinters, excepting as noted, and left a clean-cut orifice upon entering and leaving the bone. The orifices of entrance and exit in the globular head of the femur are round and equal to the diameter of the projectile. The orifice of entrance in the pelvis is round, and exceeds but a fractional part the diameter of the projectile; the orifice of exit is 0.59 by 0.39 inch in diameter, with the margins of the orifice slightly elevated. The bullet was not deformed.

VIII. Gunshot injury of the right elbow joint; bullet marked "E," caliber .30. The wound of entrance is on the external aspect of the arm opposite the bend of the elbow, 2.36 inches from the olecranon; it is round, and equal in diameter to that of the projectile; the wound of exit is 0.59 inch below the tip of the olecranon; it is star-shaped, and 0.30 inch in its greatest diameter. The projectile passed through the head of the radius, permitting the outer and posterior aspect of the forearm to receive the wound; the head is split in two portions, one-half of which is finely comminuted, the outer half, together with its portion of the neck and 0.79 inch of the shaft, remains in place without much damage to the periosteum. The pulverized bone, comprising the inner half of the head, lies free in the joint. The projectile entered the ulna 0.20 inch below the joint, near the posterior margin of the lesser sigmoid cavity; the olecranon is completely crushed; fissures extend through the greater sigmoid cavity, and the posterior portion of the articular surface. There are seventeen small splinters detached from the periosteum about the foyer of destruction. The projectile was slightly dented on one side in the cylindrical portion; otherwise it sustained no deformation.

IX. Gunshot injury of the right shoulder joint; bullet No. 6, caliber .30. The wound of entrance is round, 0.30 inch in diameter; it perforated the skin well up on the anterior aspect of the shoulder, 0.39 inch below the acromion; the wound of exit is irregular in shape, 0.59 inch in its greatest diameter, on the posterior aspect of the shoulder, 4.72 inches from the wound of entrance, measuring over the shoulder. The projectile entered the bone in the bicipital groove between the two tuberosities and traversed the head of the humerus, crushing the head in passing out posteriorly. One large splinter, 1.18 inches by 0.98 inch, was carried through the orifice of exit in the bone and found imbedded in the infra-spinatus and teres minor muscle. Four other splinters comprising the globular head of the humerus lay about the seat of fracture; the central portion of the head is pulverized and discolored by lead. The bullet was not recovered.

X. Gunshot injury of the left humerus at the surgical neck; bullet marked "K," caliber .30. The wound of entrance is round, 0.30 inch in diameter, on the anterior aspect of the shoulder, 2.36 inches below the acromion; the wound of exit is marked by a longitudinal slit, 0.39 inch in length, on the posterior aspect of the shoulder in the same vertical plane as the wound of entrance, and 1.18 inches above the latter. The projectile penetrated the surgical neck in the middle line, 0.20 inch external to the bicipital groove, and 2.36 inches from the upper extremity of the bone. The margins of the orifice are clear-cut, oval, 0.35 inch in the lateral and 0.39 inch in the vertical diameter. The orifice of exit is in the same plane, also oval, 0.47 inch in the lateral and 0.59 inch in the vertical diameter. There is but little comminution; one small splinter of bone, 0.39 by 0.16 inch lies at the bottom of the wound, attached to the periosteum. The projectile was flattened at the conical end.

XI. Gunshot injury of the face and base of skull; bullet marked "D," caliber, .30. The wound of entrance is on the prominence of the nose, 0.08 inch to the left of the center, and 0.12 inch from the tip end; it is round, 0.30 inch in diameter; the wound of exit, 0.79 inch below and to the right of the external occipital protuberance, round, 0.39 inch in diameter. The projectile traversed the nasal cavity and ranging posteriorly penetrated the cavity of the cranium in the posterior fossa, 0.39 inch to the right of the median line at the foramen lacerum posterius; it passed through the cerebellum and emerged through the occipital bone. The fracture in the latter is radiating, the splinters are displaced from within outwards. There were five principal splinters, all detached, none of which had been carried through the occipital muscle. The projectile suffered a slight indentation at the conical end.

XII. Gunshot injury left elbow joint; bullet marked "K," caliber .45. The wound of entrance is 0.79 inch below the bend of the elbow, round, 0.43 inch in diameter; the wound of exit is between the external condyle and the olecranon, star-shaped, 0.59 inch in its greatest diameter. After entering the anterior aspect of the joint the missile passed through the external condyle, fracturing the upper end of the ulna to a point 1.57 inch below the coronoid process, grooving the bone above the lesser sigmoid cavity. The bullet is very little set up, and there is a notch in the cylindrical portion near the base.

Notes on the effects of the projectiles of large and small caliber impressed by the velocity common at 500 yards on the human body, conducted at Frankford Arsenal, Pa., March 8, 1893. Some of the notes describing the lesions in the soft parts were unavoidably lost.

I. Gunshot injury left tibia; bullet No. 1, caliber .45. The ball struck the shaft of the left tibia above the middle, passing in an antero-posterior line and shattering the bone into forty fragments, the largest being 3.15 inches in length. A great deal of fine bony sand was found in the track of the wound near the wound of exit. The fissures in the bone tend to radiate from the point of impact. The latter is slightly blackened by lead. The fibula is uninjured. The bone illustrates syphilitic periostitis and hypertrophic ostitis. The projectile was evidently broken into two cylindrical halves; the half corresponding to the base was recovered and it is mushroomed.

II. Gunshot injury upper third, right femur; bullet No. 3, caliber .30. The projectile entered 1.18 inches below the trochanter major of the right femur and emerged below the head of the bone. The trochanter and upper four inches of the femur were shattered. The head of the femur is intact. The fissures are longitudinal. The orifice of entrance is well defined. The orifice of exit is filled with detached fragments held by periosteum. The bullet was slightly flattened at the conical end.

III. Gunshot injury right femur; bullet No. 2, caliber .30. The ball struck the shaft of the right femur at its middle, shattering the bone into a number of fragments. The foyer of destruction is about as extensive as in the preceding fracture. Fifteen free splinters were found. Only the leaden core of the projectile was recovered; it is split at the conical end and bent.

IV. Gunshot injury left tibia; bullet No. 2, caliber .45. The ball struck the inner side of the left tibia above the middle comminuting the bone. Four large splinters, the largest 3 inches in length, and thirty-six smaller fragments were found in the seat of fracture. The large splinters show longitudinal splintering. The bullet was split in two lateral halves; one of these and part of the other were recovered.

V. Gunshot injury of the pelvis; bullet No. 4, caliber .30. The bullet passed transversely through the body, entering the right ilium 3.15 inches below the right iliac crest and 1.57 inches from the acetabulum. The ball made a clean-cut orifice in the outer table of bone 0.39 inch in diameter, but produced a much greater fracture of the inner table, measuring 1.57 inches in diameter. Passing onward the missile struck the left ilium just below the anterior superior spine, comminuting it. The bullet was irregularly dented at the conical end.

VI. Gunshot injury left humerus; bullet No. 3, caliber .45. The ball struck the shaft of the left humerus in the middle line, 2.36 inches from the lower extremity. The orifice of entrance is somewhat larger than the caliber of the bullet; the skin on the posterior portion of the arm is ruptured longitudinally in three distinct places; these rents are, respectively, 1.18, 1.18, and 2 inches in length, and were produced by the passage of the missile and fragments of the shaft of the bone. The lines of fracture radiate from the point at which the projectile struck. The elbow joint was not involved. The bullet was mushroomed and bent; the surface is irregular.

VII. Gunshot injury right elbow; bullet No. 7, caliber .30. The ball entered the front of the right elbow joint in the middle line, fracturing the external and internal condyles obliquely and carrying away the central portion of the articular surface, which is finely comminuted. Two and thirty-six hundredths inches of the ulna, including the olecranon, were comminuted. The fissures were longitudinal. The radius was uninjured. The bullet was slightly set up at the conical end.

VIII. Gunshot injury right knee; bullet No. 1, caliber, .30. The ball entered the right knee in the middle line, producing a grooved fracture of the head of the tibia, destroying the articular cartilage of the tibia, but not touching the femur. The anterior portion of the head of the bone is slightly damaged, one fragment, 2 inches long, was partially detached, embracing the seat of attachment of the tendon of the patella and the bone upon its inner side. The fibula was not injured. The bone illustrates syphilitic periostitis and hypertrophic ostitis. The bullet was not in the least deformed.

IX. Gunshot injury of the left knee-joint; bullet marked "A," caliber .45. The wound of entrance is round, 0.39 inch in diameter, 0.20 inch external to the upper external border of the patella; the wound of exit is in the popliteal space, irregular in shape, 0.59 inch in its greatest diameter. The projectile penetrated the external condyle 0.79 inch from the upper margin of the articular surface, and passed obliquely downwards and inwards, emerging through the articular surface posterior to the internal condyle. There is very slight displacement of splinters anteriorly, and only a small splinter displaced posteriorly; the latter is still held by cartilage at its upper margin. There is an inter-condyloid fracture, but the line of separation extends through the cartilage in its posterior part only. It may be seen through the cartilage anteriorly curving upwards along the trochlear surface towards its upper margin. The patella was not injured. The bullet was slightly dented at the conical end, also in the cylindrical part near the base.

X. Gunshot injury left tibia, upper third; bullet No. 3, caliber .45. The wound of entrance is over the anterior surface of the tibia near the external border, round, 0.39 inch in diameter; the wound of exit is in the thick part of the calf, marked by a longitudinal slit 1.97 inches in length and 0.79 inch in width, with muscle protruding. The projectile struck the tibia 0.79 inch below the articular surface of the knee. The bone is fractured obliquely with a number of large fragments, detached from the periosteum; a countless number of fine fragments and bony sand lie in the foyer of fracture.

XI. Gunshot injury of the pelvis; bullet No. 4, caliber .45. The wound of entrance is round, 0.45 inch in diameter; the wound of exit is irregularly quadrilateral in shape, 1.38 inches in its greatest diameter. The bullet entered the left ilium 0.39 inch anterior to and above the sciatic notch; the orifice of entrance is a trifle larger than the diameter of the missile; there is very little fissuring; the projectile crossed and produced a stellate fracture of the right side of great extent. The bullet is set up and flattened laterally at the conical end. The cylindrical part has lost in caliber and appears to have been drawn toward the base.

Notes on the effects of the projectiles of large and small caliber impressed by the velocity common at 800 yards on the human body, conducted at Frankford Arsenal, Pa., March 8, 1893.

I. Gunshot injury of the right tibia in the middle third; bullet marked "A," caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is in the middle of the calf, starlike in shape, 0.39 inch in its greatest diameter. The bullet entered the shaft of the right tibia 6 inches below the knee joint. The destruction in the bone approximates very closely in appearance that of a perforation. Examination immediately after the shot failed to show mobility, and it is believed that the fracture occurred in the subsequent handling of the body. The displacement of the principal fragments is very slight; the periosteum is not broken on the outer side; the periosteum on the inner side of the shaft is only detached about the orifice of entrance. The fibula is intact. The projectile was not deformed.

II. Gunshot injury right shoulder; bullet marked "J," caliber .45. The wound of entrance is oval, 0.59 inch in its greatest diameter; the wound of exit is star-shaped, 0.50 inch in its greatest diameter. The bullet entered the right humerus

below the tuberosity and anterior to the bicipital groove and emerged in the posterior and lower portion of the head, crushing the neck and producing an oblique fracture of the upper shaft. The projectile was not deformed.

III. Gunshot injury of the skull; bullet marked "A," caliber .45. The wound of entrance is round, 0.47 inch in diameter; the wound of exit is star-shaped, 1.18 inches in its greatest diameter. The vault of the cranium is fissured into many fragments. The projectile is irregularly flattened at the conical end and slightly flattened in the cylindrical portion near the base.

IV. Gunshot injury of the right ulna near the elbow joint; bullet marked "K," caliber .30. The bullet entered the forearm anteriorly, making a round wound of entry 0.35 inch in diameter. The wound of exit is in the same plane anteriorly, slightly irregular, 0.28 inch in diameter. The projectile entered the ulna 1.57 inches below the coronoid process, comminuting the shaft; one fissure 2.36 inches in length extends down the shaft. The periosteum along the posterior surface of the ulna is not detached. The projectile was lost.

V. Gunshot injury right shoulder joint, bullet No. 5, caliber .30. The wound of entrance is round, of the diameter of the bullet; the wound of exit about the size of the thumb nail. The bullet penetrated the right shoulder, entering the head of the humerus on the inner side of the anatomical neck, producing a clean-cut wound without displacement of the articular surface. The missile then entered the glenoid cavity of the scapula, fracturing it into a large number of fragments and producing in addition a transverse fracture of the body. This fracture extends from the inner margin of the spine 1.18 inches below the position of the glenoid cavity. The coracoid process was also detached and the clavicle fractured through the middle. The projectile was lost.

Notes on the destructive effects of the projectiles of large and small caliber, impressed by the velocity common at 1,200 yards, on the human body, conducted at Frankford Arsenal, Pa., March 9, 1893.

I. Gunshot injury lower third, left femur; bullet marked "J," caliber .45. The wound of entrance is round, 0.45 inch in diameter; the wound of exit is in the upper part of the popliteal space, marked by a slit running obliquely 1.38 inches in length. The missile struck the shaft of the left femur 2.36 inches above the articular cartilage on the inner side of the median line. The bone immediately behind the point of impact covering an irregularly space 1.50 by 2 inches in diameter was carried away and lies finely comminuted in the track of the bullet; only a fraction of the number of the splinters of bone could be recovered. Some fragments of lead were found with the bony sand. The projectile was very slightly flattened in the cylindrical portion near the base; one-third of the conical portion of the bullet was severed laterally and lost; the remaining two-thirds are flattened laterally.

II. Gunshot injury of the head of the right tibia; bullet marked "K," caliber .30. The wound of entrance is 0.30 inch in diameter, and 0.59 inch below the patella; the wound of exit is in the upper part of the calf; it is quadrilateral in shape, 0.30 inch in its largest diameter. The projectile perforated the head of the tibia in the middle line, 0.39 inch below the articular surface. The diameter of the track of the projectile corresponds to the diameter of the missile; the orifice of exit is on the posterior surface, 0.39 inch distant from the articular facet for the fibula. No large fragments were found in the tissues. The fibula and the articular surface of the head of the tibia are uninjured. The projectile was not deformed.

III. Gunshot injury lower end of right femur; bullet marked "D," caliber .30. The wound of entrance is round, 0.30 inch in diameter, 0.79 inch above patella; the wound of exit is in the internal and upper part of the popliteal space, marked by a quadrilateral orifice having a punched-out appearance, 0.79 inch in its greatest diameter. The projectile perforated the anterior face of the bone about its middle, immediately above the upper margin of the articular surface. A small quantity of finely pulverized bone was found in the wound of exit. There was no fissuring, and the articular surface was uninjured. The projectile sustained a slight flattening of its tip at the conical end.

IV. Gunshot injury of the left knee-joint; bullet marked "B," caliber .45. The wound of entrance is round, 0.45 inch in diameter, a little internal to the middle of the patella; the bullet ranged downwards, backwards, and outwards, inflicting a wound of exit in the fleshy part of the calf, which is quadrilateral in shape, 0.79 inch in length. The bullet entered the patella on the inner side of the median line and passed through the outer condyle, emerging 0.79 inch from the point of entrance, splitting the outer tuberosity. A slight outward displacement of the fragments shows a fissure extending upwards to the margin of the articular cartilage. The patella is broken into a number of fragments. Passing downward the bullet entered the left tibia, carrying away a portion of the outer cartilage and grazing the

top of the fibula. The bullet was flattened laterally along its cylindrical and conical portions on one side, and flattened at the conical end alone on the opposite side.

V. Gunshot injury of the left tibia and fibula near the ankle joint; bullet marked "G," caliber .45. The wound of entrance is over the ankle in front, round, 0.45 inch in diameter. The wound of exit is just above the external malleolus between the tendo Achillis and the fibula. It is marked by a longitudinal slit, 1.38 inches in length. The bullet entered the tibia 1.18 inches above the ankle joint in the median line; the missile struck the tendon of the tibialis anticus muscle displacing it to the outer side. The inner portion of the shaft and internal malleolus remain intact. The shaft on the outer side is fissured irregularly; a zigzag line extends between the points of entrance and exit. The fibula is fractured at the same level. The bullet is flattened in the cylindrical portion near the base, and flattened laterally at the conical end, the flattened surface at the latter point being very irregular.

VI. Gunshot injury of the right tibia near the ankle; bullet marked "H," caliber .30. The wound of entrance is over the lower part of the leg anteriorly, round, 0.30 inch in diameter. The wound of exit lies in the same plane posteriorly; it presents a punched-out appearance, is triangular in shape, 0.30 inch in its greatest diameter. The bullet perforated the tibia on the anterior aspect in the median line, 2.17 inches above the ankle joint. The orifice of entrance has a punched-out appearance; it is 0.30 inch in the vertical and 0.24 inch in the horizontal direction. There is a fissure 3.75 inches long, extending upwards from the perforation; it is seen through the periosteum, the latter being intact. Posteriorly between the foyer and the wound of exit in the skin many fine splinters of bone are distributed; the fibula is uninjured. The bullet is very little flattened at the conical end.

VII. Gunshot injury of the right knee; bullet No. 1, caliber .45. The wound of entrance is 0.30 inch internal to and above the patella; it is round, 0.45 inch in diameter; the wound of exit is in the middle of the popliteal space, star-shaped, 0.59 inch in its greatest diameter. The bullet entered the bone 1.18 inches above the articular surface. The diameter of the perforation corresponds to the diameter of the missile. The orifice of exit posteriorly admits the index finger and is situated in the popliteal space above the trochlear surface on the inner side of the median line. The bullet was recovered, very little dented at the conical end.

VIII. Gunshot injury of the upper third of the left femur; bullet No. 2, caliber 0.45. The wound of entrance is round, 0.45 inch in diameter; the wound of exit is marked by a slit-like opening running longitudinally 1.18 inches in extent. The projectile entered the anterior aspect of the femur and shattered the bone above its middle. Nine large splinters, from 4 inches to 0.40 inch in length are found in the foyer of fracture, and only partially held by the periosteum. The bullet was set up and dented at one side at the conical end.

IX. Gunshot injury of the upper third of the right femur; bullet No. 1, caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is in the fleshy portion of the thigh, quadrilateral in shape, 0.79 inch in its greatest diameter. The bullet entered the bone 5.50 inches below the trochanter major, comminuting the shaft. The largest fragment is 4 by 1.18 inches, and is firmly adherent to the surrounding tissues. The specimen shows an old united fracture of the upper shaft passing obliquely and immediately below the trochanters. The bullet was flattened at the conical end and distorted to one side; the leaden nucleus protrudes from the mantle at the base.

X. Gunshot injury, right tibia, middle of shaft; bullet marked "T," caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is marked by a slit in the calf, 0.35 inch in its greatest length. The bullet struck the subcutaneous surface of the tibia at its middle, splintering the bone into several large fragments; the largest one, embracing the crest of the tibia, is 5 inches long. Viewed from the inner side the fissures cross at the point of impact, so as to form an "X." The periosteum is intact and binds the fragments together so that, as far as the dissection would indicate, there is no reason to suppose that the fracture would not unite readily. A large number of fine splinters of bone were found in the muscular tract of the calf, near the seat of fracture. No great laceration of soft parts observed. The fibula was not injured. The projectile was dented at the conical end.

XI. Gunshot injury, right tibia near the ankle joint; bullet marked "C," caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is marked by a slit 0.30 inch in length. The bullet perforated the shaft 2 inches above the internal malleolus. On removing the skin the orifice of entrance in the bone presents sharply cut edges, and it corresponds in size to the diameter of the missile. The bullet passed out at the posterior aspect of the bone, the orifice at this point being irregular in shape and a trifle larger than the orifice of entrance. A few splinters of bone were found in the track of the bullet leading from the bone. The projectile was not deformed.

XII. Gunshot injury, left tibia near ankle; bullet marked "Q," caliber .30. The wound of entrance is round, corresponding to the diameter of the bullet; the wound

of exit is triangular in shape and 0.30 inch in its greatest diameter. The bullet perforated the tibia 0.79 inch above the ankle joint in the middle line. It passed out in an oblique direction, emerging from the posterior surface near the fibula without injuring it. The perforation is perfect without apparent fissures in the recent state. A few splinters of bone were found in the track of the projectile near the wound of exit. The projectile was lost.

XIII. Gunshot injury, head of left tibia; bullet marked "M," caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is on the outer border of the popliteal space, irregular, 0.50 inch in diameter. The missile perforated the tibia 3 inches below the knee joint in the subcutaneous surface; the orifice of entrance into the bone is clearly cut, round, being the diameter of the projectile; the orifice which it inflicted upon leaving the bone posteriorly is irregular, 0.35 inch in diameter; there are several spiculæ of bone in the track of the projectile. The fibula is uninjured. The projectile was not deformed.

XIV. Gunshot injury, left tibia, middle of shaft; bullet marked "N," caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is triangular in shape, 0.66 inch in length, and located on the outer side of the calf. The absence of motion between the fragments led us to believe, as in a former instance, that we very likely had a perforation, but upon dissection it was found that the bullet ranged from the inner to the outer side and struck the crest of the tibia at the middle, passing wholly in front of the medullary canal, just guttering the crest. Nevertheless there was an oblique fracture running from the point of impact downward and backward, the periosteum still firmly surrounding the two fragments. The track of the missile through the tibialis anticus contains finely pulverized bone. The projectile was bent upon itself in the conical portion and dented.

XV. Gunshot injury, left radius, middle third; bullet marked "S," caliber .30. The wound of entrance is round, 0.30 inch in diameter, and on the anterior aspect of the forearm; the wound of exit is posterior, irregular, 0.35 inch in its greatest diameter. The bullet struck the radius above the middle, comminuting the shaft; the fragments are attached to the periosteum; some small splinters of bone are found in the track of the bullet leading to the wound of exit. The projectile was not deformed.

XVI. Gunshot injury, middle third, right ulna; bullet marked "K," caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is also round, a trifle larger than the caliber of the projectile. The bullet entered the anterior aspect of the forearm and passed through the ulna in the middle of the shaft, comminuting the bone into a number of fragments; the median nerve lies uninjured on the radial side of the wound of entrance. The fragments are held together by periosteum and the interosseous membrane. The radius was not injured. The projectile was not deformed.

Notes on the effects of the projectiles of large and small caliber impressed by the velocity common at 1,500 yards on the human body, conducted at Frankford Arsenal, Pa., March 9, 1893.

I. Gunshot injury of the lower third of the left humerus; bullet No. 3, caliber .45. The wound of entrance is round, 0.59 inch in diameter, 1.57 inches above the bend of the elbow; the wound of exit is on the external aspect of the forearm, marked by a longitudinal slit, 1.18 inches in length. The bullet struck the humerus 1.18 inches above the articular cartilage, in the middle line; the bone was shattered into a number of large fragments, ranging from 0.50 inch to 2.50 inches in length. The bone near the point of impact was discolored by lead. Small particles of lead are seen on the outer side. The bullet separated in two parts longitudinally, the greater part only having been recovered.

II. Gunshot injury of the lower shaft of the right humerus, furrowing; bullet marked "D," caliber 0.30. The wound of entrance is round, 0.30 inch in diameter, 0.79 inch above the bend of the elbow; the wound of exit is slit-like, 0.35 inch in its longest diameter and 0.59 inch above the external condyle. The bullet struck the shaft 2.36 inches above the external condyle on the outer side of the median line and glanced outward, furrowing the bone. The projectile was bent to one side, and laterally flattened at the conical end; the cylindrical part of the jacket was twisted upon itself and the leaden nucleus slightly protrudes at the base.

III. Gunshot injury, upper third, left femur; bullet No. 7, calibre .45. The wound of entrance is round, 0.45 inch in diameter; ball lodged. On making an incision exposing the seat of fracture, part of the bullet, including one-third of the cylindrical portion and the base, is seen lying against the lower end of the upper fragment and immediately in contact with the bone. The base of the bullet lies against the bone and the flattened cylindrical part points toward the wound of entrance. A second portion of the bullet was recovered lying on the anterior portion of the neck of the femur just below the capsular ligament, where it had slid a distance of 5

inches. The femur is badly shattered into a number of large splinters, some measuring 4.33 inches long, and among them are found many small fragments of lead.

IV. Gunshot injury, right femur, upper third; bullet No. 8, caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is marked by a transverse slit, 0.35 inch in its greatest length. The missile struck the anterior portion of the shaft 3.54 inches below the anterior superior spinous process of the ilium causing a complete fracture; the periosteum binds the fragments together. There is a fissure 5.20 inches in length extending in a waving line downwards and outwards below the middle of the shaft. The projectile emerged from the bone just below the trochanter minor. Several small fragments on the posterior face of the bone hang by shreds of periosteum, and small spiculæ are found free near the wound of exit in the skin. The projectile was dented at the conical end.

V. Gunshot injury, right knee joint; bullet No. 7, caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is in the popliteal space, slit-like, 0.30 inch in length. The bullet entered the right femur 0.59 inch above the articular surface and 0.59 inch external to the median line, causing a clear-cut perforation without fissures above or below the point of impact. The bullet passed out of the bone at the outer margin of the popliteal space leaving a few fine spiculæ of bone at the orifice of exit and a small quantity of bony sand at the wound of exit in the skin. The projectile was not deformed.

VI. Gunshot injury left femur, middle third; bullet No. 6, caliber .30. The wound of entrance is round, having the same diameter as the projectile; the wound of exit is slit-like, 0.36 inch in length. Examination soon after the injury and before the body had been moved, for the next shot failed to show the presence of motion between the fragments, and for this reason the following remarks were entered on the memorandum to the anatomist: "This injury very likely presents a perforation in the middle of the shaft, and the limb should be handled very carefully." Upon dissection the following condition was found: The bullet struck the shaft of the femur above the middle, producing an extremely oblique fracture and detaching one large fragment belonging to the outer side of the bone, 4 inches in length and two-thirds of an inch in width. There is a fissure extending from a point two-thirds of an inch below the trochanter minor downwards to the point of impact of the missile and extending downwards into the outer side in a waving line to a point 4 inches below the point of impact. The periosteum was not detached. A very small quantity of bone is found in the track of the bullet from the bone to the wound of exit. It is more than likely that the immediate effects of the projectile simulated a perforation with very fine fissures that served to complete the fracture as stated when the body was handled by the man who carried it a distance of 10 miles in a wagon. The projectile was flattened at the conical end.

VII. Gunshot injury left humerus, junction of upper and middle thirds; bullet No. 0, caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is marked by a longitudinal slit, 0.33 inch in length. The bullet struck the shaft a little above the middle third, causing a long oblique fracture extending from without inwards 4 inches in length; there is a slight comminution of the lower fragment at the point of impact; the periosteum was not detached. The projectile was not recovered.

VIII. Gunshot injury right humerus, near surgical neck; bullet No. 5, caliber .30. The wound of entrance is round, having the diameter of the projectile, over the surgical neck in front; the wound of exit is on the same plane posteriorly, marked by a slit 4 lines in length. The bullet struck the surgical neck of the humerus in the middle line comminuting the bone; the periosteum at the point of entrance into the bone is untorn; upon leaving the bone the projectile caused a radiating fracture; several fragments are held by periosteum and very little displaced; a few fine spiculæ are found in the track of the bullet leading to the wound of exit. The projectile was lost.

Notes on the effects of the projectiles of large and small caliber, impressed by the velocity common at 2,000 yards, on the human body, conducted at Frankford Arsenal, Pa., March 16, 1893.

I. Gunshot injury left tibia, middle third; bullet No. 1, caliber .45. The wound of entrance is oval in shape, 0.51 inch in its greatest diameter. The projectile remained lodged under the skin of the calf. The bullet entered the subcutaneous part of the shaft, 5.50 inches below the knee joint, causing extensive comminution of the bone at the foyer of fracture, including 2 inches of the shaft. Some of the fragments are free whilst others remain attached to the periosteum. The bullet was found under the skin of the calf; it was cleft longitudinally through the conical part, one-half of the cone having become detached from the cylindrical part. The detached fragment was found embedded in the tibialis anticus muscle.

II. Gunshot injury of the right tibia at junction of middle and lower thirds; bullet No. 4, caliber .30. The projectile entered side-on, inflicting a wound of entrance which runs obliquely 0.98 inch long and 0.39 inch wide. The bullet lies under the skin posteriorly in the lower part of the calf. The bullet guttered the inner side of the tibia 5.12 inches above the internal malleolus. On removing the skin several spiculæ of bone are seen in the wound; the outer border and crest of the tibia are uninjured; the posterior surface of the bone is splintered over a distance of 3.15 inches in lines which radiate from the point of emergence. The periosteum is not detached, excepting in the line of the passage of the projectile and over an area adjacent to the posterior margin of the groove, between 0.20 and 0.40 inch in diameter. The fibula was not injured. The bullet was embedded in the muscle of the calf with its point resting against the skin and its base presenting in the track through the muscle adjacent to the bone, a distance of 0.79 inch. The projectile is slightly flattened at the conical end, otherwise it is unaltered.

III. Gunshot injury left knee joint; bullet No. 2, caliber .45. The wound of entrance is round, 0.45 inch in diameter, above and internal to the patella; the wound of exit is in the lower part of the popliteal space, oval, and 0.59 inch in the greatest diameter. The bullet perforated the tibia 1.18 inches below the articular surface. The orifice of entrance in the bone is sharply defined, irregular in shape, 0.59 inch in the vertical and 0.39 inch in the horizontal line; the orifice of exit is also irregular, 0.59 inch in its greatest diameter. There is a fracture of the shaft marked by a fissure, which runs downwards and backwards; the compact tissue of the upper and posterior surface of the bone is broken by radiating fissures into six fragments. The muscular track from the bone to the wound of exit contains some fine spiculæ of bone. The projectile was not recovered.

IV. Gunshot injury right knee joint; bullet No. 9, caliber .30. The wound of entrance is round, 0.30 inch in diameter and 0.39 inch from the internal border of the patella at its middle; the wound of exit is in the upper part of the popliteal space marked by an oblique slit-like opening 0.39 inch in length. The projectile entered the bone 0.79 inch above the articular surface, making a perforation of the femur; the missile passed out in the median line in the popliteal space, perforating the popliteal vein, leaving the artery uninjured. The wound is full of venous blood clots. A few very fine spiculæ of bone were found in the track of the projectile leading to the wound of exit. There is a fissure 4.72 inches in length, which extends from the orifice of entrance in the direction of the shaft, and a number of smaller radiating fissures are observed to start from the orifice of exit. The projectile was recovered from the sawdust very much deformed. The metallic jacket was ruptured at the conical end, having a slit running along the side of the cylindrical portion at the end of which a transverse slit occurs, which includes one-half of the cylindrical part of the envelope; the leaden nucleus has parted entirely from the jacket; it is flattened at the conical end, bent upon itself in the cylindrical portion, and scooped out on one side.

V. Gunshot injury left femur, upper third; bullet No. 3, caliber .45. The wound of entrance is round, 0.45 inch in diameter; the wound of exit is on the outer and posterior aspect of the thigh, marked by a longitudinal slit, 0.59 inch in length. The projectile made a glancing shot, striking the outer aspect of the shaft of the femur 4.72 inches below the trochanter major, producing an oblique fracture of the shaft from above downwards and inwards; the fragments are considerably displaced, the lower shaft lying to the outer side; the periosteum is detached about the point of impact, but the fragments of bone are not loosened to any very great extent; there is a fissure extending from the trochanter minor downwards a distance of 6 inches. Particles of lead were found in the foyer of fracture. The bullet was seemingly split in two lateral halves nearly equal in weight; the greater half only was recovered.

VI. Gunshot injury of the right femur, upper third; bullet No. 0, caliber .30. The wound of entrance is round, 0.30 inch in diameter; the wound of exit is triangular in shape, 0.39 inch in its greatest length. The bullet struck the shaft of the femur in the middle line anteriorly, 7 inches below the anterior superior spine of the ilium, comminuting the bone into a number of fragments, which are held by periosteum. The bullet was flattened at the conical end; otherwise it is unaltered.

VII. Gunshot injury left humerus, surgical neck; bullet No. 4, caliber .45. The wound of entrance is round, 0.45 inch in its greatest diameter; the wound of exit is crescentic in shape with a flap of skin filling the concavity of the crescent; it is 0.55 inch in its greatest diameter. The projectile grooved the outer side of the surgical neck of the humerus 0.39 inch external to the bicipital groove. The periosteum is not displaced except between the point of impact and the anatomical neck. The articular surface is uninjured. The bone is discolored by lead, and a small fragment is seen lying against the compact tissue of the bone. Another small fragment of lead, 0.39 inch by 0.08 inch, was found in the track of the bullet near the

wound of exit. The bullet was slightly set up and partially split at the conical end and grooved on one side in the cylindrical portion.

VIII. Gunshot injury of the surgical neck of the right humerus; bullet marked "K", caliber .30: The wound of entrance is oval in shape, 0.30 inch in its greatest diameter; the wound of exit is marked by a longitudinal tear, 0.79 inch in length. The bullet entered the bicipital groove 2 inches below the articular surface and emerged on the inner aspect of the shaft. The wound of exit is filled with fine spiculæ of bone. The seat of fracture shows ten fragments of bone; there is a fissure 2.75 inches long, which runs in the shaft downward and outward; the periosteum over this oblique fracture is not detached. The bullet was recovered slightly flattened at the conical end.

OBSERVATIONS UPON THE FOREGOING RESULTS.

Soft parts.—The wound of entrance corresponds in diameter as a rule to the diameter of the projectile. In the middle and remote ranges the entrance wound measured less at times than the diameter of the projectile, but the difference was only apparent since the wound invariably admitted a projectile of like caliber to the one that inflicted it. In the short ranges it was often noted that skin overlying bone and resistant aponeuroses was apt to show a wound of entrance actually exceeding in diameter that of the missile. The edges of the wound of entrance were at times clear-cut, but more often they were rolled in, and often blackened for a distance of a line about the circumference. The latter circumstance gave rise to the notion formerly that the discoloration was due to burning, but from experiments conducted by Beck, also by myself to be cited later, this fallacy has been forever set at rest.

The wound of exit of the .30-caliber rifle was generally larger than the wound of entrance, and beyond the zone of explosive effects especially it was generally round, marked at times by a mere slit; again it was star-shaped, T-shaped, semicircular, etc.; the edges were generally turned out. When a wound of exit exceeded in diameter that of the projectile to any extent the circumstance was generally regarded as indicative of bone lesion.

Effects upon diaphyses of long bones.—Up to 350 yards the destructive effects of the two projectiles are alike severe. Unless guided by the wound of entrance or other circumstances it is difficult within this range to determine by the appearance of the injury alone which of the projectiles may have caused it. After this range the destructive effects of the smaller projectile become less than those of the larger missile. The fissuring is less, the spiculæ of bone are larger, and they are more apt to be attached to the periosteum. These differences are especially noticeable from the 500 to the 1,500-yard ranges. At 2,000 yards the small bullet again shows rather extensive comminution. This fact has been noted by all observers, and it has been variously explained, though not in a very satisfactory manner. It has been said that the projectile has lost so much of its velocity of translation when it reaches this part of its course that it is apt to lodge, and that the velocity of rotation causes such a disturbance when it is about to engage that comminution is the result. The angle of impact, which is rarely vertical at this range, has been brought forth as a possible cause. Certain it is that a number of the projectiles were observed at this range by us to impinge side-on at the moment of impact. Whether this circumstance is more apt to occur with reduced charges than we would expect to find in the natural condition is a mooted question.

Delorme and Chavasse state that the Lebel rifle bullet appeared to produce more comminution beyond 1200 m. than the projectile of the Gras rifle. Our experience at Frankford Arsenal does not accord with theirs in this particular, and for very good reason. They experimented with the projectile of the Lebel, which for all practical purposes corresponds to the projectile of our .30 caliber experimental Springfield rifle, and they compared its effects with that of the Gras. The latter is their 11 m. m. gun, which in caliber is a trifle less (0.433) than our .45 caliber Springfield rifle. This alone would make no great difference, but when we compare the weight of their large caliber with ours, we find that our service bullet is 125 grains heavier. This in itself is sufficient to account for the greater destructive effects of our larger caliber projectile over theirs, hence the difference in the results referred to.

Effects upon joints.—Before engaging upon this part of the subject I wish to preface my remarks by stating that the humane wound of the small bore gun is especially observed in the joints and soft parts. Owing to the reduction in caliber the wounds in the latter partake more of the nature of subcutaneous wounds, and experience shows that they heal very kindly under appropriate treatment.

It is not necessary in this instance to dwell especially upon the destructive effects of the larger leaden projectile upon joints. Suffice it to say that the greater frontage, which it naturally possesses, is made greater still by deformation, and that these

facts with velocity sufficient to penetrate a joint serve to convert the .45 caliber projectile into a very destructive missile.

The experiments conducted at Frankford Arsenal show in a striking manner the difference in destructive effects by the two bullets upon the spongy ends of bones. In order to appreciate this difference it is necessary to go beyond the zone of explosive effects for the .30 caliber projectile, namely 350 yards. Even within the latter range perforation with slight fissuring will at times be noticed. From the latter range to the 1,500-yard range perforations and gutterings with but little fissuring are almost invariably seen. Between 1,500 and 2,000 yards, the specimens show perforations still, but there is a tendency to fissuring again, as noted in the shorter ranges.*

Deformation of projectiles.—The deformations of projectiles which accompany the majority of the specimens represent nearly every form of alteration known. Those of the leaden projectiles are sufficiently familiar and require no comment. The deformation of the jacketed projectile is most common at the conical end, and consists usually in a slight dent or flattening; partial separation of the metallic mantle from the leaden nucleus is occasionally seen; complete separation between the jacket and nucleus is a very rare occurrence. It occurs principally with high velocities at close range, when the projectile encounters resistant bone. Separation of the envelope and nucleus was noticed very seldom in the middle and remote ranges.

THE HEAT IMPARTED TO PROJECTILES.

The heat imparted to a projectile by the ignition of the powder, the resistance in the barrel, etc., has been very much exaggerated. Some have gone so far as to claim that the small jacketed bullets are rendered aseptic thereby. In a series of experiments conducted at the pathological laboratory of the Johns Hopkins University and Hospital, also at Frankford Arsenal during the past few months, I was able to show that this claim is false. In order to arrive at some definite conclusion in the matter I undertook a series of experiments † calculated to answer the two following questions:

1. Are projectiles from portable hand weapons sterilized by the act of firing?
2. Can a septic bullet infect a gunshot wound?

As a preliminary to the work of noting the effects of firing bullets that had been previously contaminated it was considered proper to ascertain the condition, bacteriologically speaking, of bullets in their original packages. After a number of observations it was found that 53 per cent of all cartridges in their original packages were absolutely free from germs. This is to be ascribed to the cleanly methods which are necessary in their manufacture.

The literature of gunshot wounds shows that the majority of surgeons of the past and present times believe that the act of firing destroys any infection that might have been accidently or otherwise placed upon the projectile.

In order to ascertain the facts in the matter I fired projectiles after they had been sterilized by heat from revolvers that had been similarly sterilized. The projectiles were recovered from sterilized cotton and dropped into gelatin tubes. The latter revealed no growth.

Projectiles covered with dust were then fired from sterilized revolvers into sterilized cotton. As each projectile was recovered it was dropped into a gelatin tube. Colonies appeared in every instance.

In a series of experiments with the .22 and .38 caliber revolvers, the .45 caliber Springfield rifle, as well as the .30 caliber experimental Springfield rifle, whose ballistic qualities correspond to the Mannlicher, improved Mauser, Lebel, etc., the projectiles were in all instances infected with the germs of anthrax and fired into sterilized materials and into animals.

The tables of results show that anthrax bacilli or spores are seldom, if ever, destroyed by the act of firing.

Bullets infected with the streptococcus of erysipelas, with some of the same culture of tetanus mentioned below, and with the bacillus pyogenes soli of Bolton, were fired through the ears of rabbits with a .45 calibre Colt's revolver. The erysipelas coccus was communicated to one animal, and the bacillus pyogenes soli was recovered from the wound of another. Tetanus was not communicated.

A bullet infected with a culture of the bacillus of tetanus was fired into a horse with the modified Springfield rifle with negative results; rabbits inoculated with some of the same culture died promptly. At the suggestion of Prof. Meade Bolton of the Johns Hopkins Hospital a bag of tetanus earth was placed against the hip of another horse and the projectile of the .30 caliber experimental Springfield rifle was fired through the earth into the fleshy part of the ham without result.

* See Figs. 1 and 2, Pl. 4.

† (See New York Med. Journal, Vol. LVI, No. 17, October 22, 1892, p. 458.)

The following conclusions may be formulated from the foregoing:

1. The majority of cartridges in original packages are sterile and free from septic germs.

2. The sterile condition of cartridges is due to the thorough disinfection and absolute cleanliness observed in the process of manufacture.

3. The majority of gunshot wounds are aseptic because the vast majority of the projectiles inflicting them are either sterile or free from septic germs.

4. Anthrax spores or bacilli, when applied to the projectile of a portable hand weapon are seldom, if ever, entirely destroyed by the act of firing.

5. When a gunshot wound is inflicted upon a susceptible animal by a projectile infected with anthrax bacilli the animal becomes infected with anthrax, and dies in a vast majority of instances from said infection.

6. The streptococcus of erysipelas and the bacillus pyogenes soli, when placed upon the projectile of the .45 caliber Colt's revolver, are not always at least destroyed by the act of firing, and they are liable to cause infection.

7. Projectiles from portable hand weapons are not sterilized by the act of firing.

8. A septic bullet can infect a gunshot wound.

It is evident from these results that the act of firing does not impart enough heat to the projectile to destroy organisms placed upon its surface, and that there never is sufficient heat in the projectile to cauterize the track which it makes in the tissues. Yet he who may have occasion to inquire into the literature of this subject will be surprised to find the number of eminent surgeons who until very recently at least were firm believers in the notion that gunshot wounds owed the discoloration about the wound of entrance and other appearances in the wound to the heat of the projectiles.

In these days of precise work in scientific details the amount of heat imparted to the projectile can be pretty accurately ascertained, and aside from my own experiments cited already it may not be amiss to quote the following:

"Dr. B. von Beck, medical director fourteenth army corps of the German army, to whom we owe so much of our knowledge of the character of wounds inflicted by the rifles of small caliber, conducted some experiments to determine the amount of heat imparted to the hard bullet of small caliber having a mantle of steel or copper. He fired into a target made of boards and thin sheets of iron arranged alternately about an inch apart. He recovered the projectiles as soon as possible after firing, never allowing more than ten seconds to intervene between the firing and the recovery of the missiles. The latter were dropped into 300 grams of mercury in a paper box 7 centimeters high and 3 centimeters wide. By means of a cork fixed on the bulb of a thermometer he held the projectile under the mercury and noted the rise of temperature of the metal. By this method he conducted many experiments, and he says that the missiles were invariably handled by the fingers, and that they never possessed heat enough to burn the skin. After making allowance for specific heat and the conductivity of the different metals entering into the composition of the projectiles used, he found that even when the projectiles encountered resistance from three to four times greater than that offered by the human body the results were as follows:

	° C.
Temperature of the leaden bullet of .45 caliber when recovered	69
Temperature of the leaden bullet of .30 caliber, covered with steel, when recovered	78
Temperature of the leaden bullet of .30 caliber, covered with copper, when recovered	110

"He states that these experiments overthrow the theory that certain lesions in wounds can be attributed in any way to the heat imparted by the bullet. He believes that the periphery of the projectile is alone heated, because the act of heating is accomplished so instantaneously that the heat can not be conducted lower."

GUNSHOT INJURIES INFLICTED BY PROJECTILES OF HARD EXTERIOR.

As may be observed, the foregoing report deals principally with the comparative difference in destructive effects between the .30 caliber German-silver jacketed bullet and our .45 caliber leaden projectile. It may be appropriate here to consider the effects of the different projectiles of hard exterior as contrasted with the effects of the old leaden bullets of large caliber belonging, for instance, to the older Mauser and the Gras of the Germans and French.

With the introduction of the modern rifle of small caliber in 1886 the subject of gunshot wounds received renewed interest for the military surgeon at least. The study of the advantages to be obtained by a reduction in caliber and the use of projectiles of hard exterior dates from the publication of a pamphlet by Prof. Hebler, a German artillery scientist, in 1882. Since that time foreign governments one

after the other have adopted the small-bore weapon, and these are all of the repeating pattern with the exception of the weapons adopted by Russia and Italy, these countries having adopted single loaders.

We are indebted to military surgeons from nearly all the governments which have adopted the new armament for valuable experiments touching upon the effects of the projectiles of the different weapons, both upon cadavers and dead and living horses.

In Germany Busch and Reger were among the first to call attention to the difference in destructive effects between the old leaden bullets of large caliber and the new bullets of small caliber with hard envelopes. Later, Profs. Morosow, Tauber, and Pawlow, of Russia, produced valuable contributions. Delorme and Chavasse, Chauvel and Nimier, especially, in France pursued the effects of the Lebel projectile on cadavers most thoroughly, and their work will always be prized by those who happen to explore this field of literature henceforth. Bruns in Germany and Habart in Austria have made valuable experiments of late, which have served to show in a scientific manner the precise effects of the Mauser and Mannlicher projectiles.

A study of the hand weapons forming the armament of the different European armies shows that, though the guns themselves may vary in their mechanism, the weight and caliber of the projectiles are very much the same. The calibers vary from 6.5 mm. to 8 mm. The velocity and energy of the projectiles differ but little. In fact, the guns and their ammunition are so similar that the ballistic qualities of one gun will answer very nearly for those of another; and we may add also that within certain limits the wounds inflicted by the projectiles are the same.

A study of the effects of the projectiles on cadavers brings out prominently the fact that the amount of destruction is guided by the same mechanical laws which governed the study of the effects of the older and softer leaden projectiles.

If we look back upon the conditions which influence destructive effects in wounds we will find prominent among them three factors: (1) Velocity of the projectile; (2) resistance on impact, and (3) deformation of the projectile.

It was while bearing these factors in view that the ballisticians predicted the effects of the modern bullet long before it was even tried, and it was a correct appreciation of these very factors which prompted Longmore to pen the following lines twenty-three years ago. Says Longmore: "The materials of which bullets are composed will influence to a certain extent the nature and character of the wounds caused by them. If bullets of steel or any similar hard and coherent metal should ever be found capable of being economically employed in firearms many of the ordinary features of gunshot wounds as they at present exist will be materially changed. In proportion to the increase of hardness and cohesive force of the metals the greater will be the ease with which the brass plates and other accouterments, the strong bones of the extremities, the vault of the cranium, and any resisting structures, will be perforated by it. Again, we shall have bullets which will not become softened at ordinary increases of temperature, broken and dispersed in fragments, subject to loss of substance, and capable of undergoing the various alterations in form which leaden bullets are apt to assume on coming in collision with certain external objects and hard parts of the body."

When we reflect that the steel mantle projectile is in use to-day, and that its penetration which has excited the wonder of the military world should depend upon its well-nigh indestructible hardness for the human body, we must read with more admiration than ever the prophetic words of the great surgeon.

If the velocity, the resistance on impact, and the hardness of projectiles were constant, we would find no hesitancy in stating, *cæteris paribus*, that the destructive effects of projectiles would remain the same.

I believe we can take for granted that the velocity of the different mantle projectiles is about the same. As to the resistance on impact that also may be considered the same; that is, adult bodies will offer about the same resistance in their different anatomical parts. For instance, the femur of one individual will offer about the same degree of resistance encountered in the femur of another, and we may take for granted that the calvaria and tibiæ of different subjects will each offer about the resistance found in corresponding parts of the same or other subjects.

Having determined that the velocity and resistance on impact are pretty constant, what can we say of the third factor concerned in determining the amount of destructive effects, namely, the hardness of the different projectiles? We must assume in studying the effects of modern projectiles that penetration with them is determined as formerly by the hardness and coherence of the metals entering into their composition.

If all the mantle projectiles were composed of the same metal, or metals having equal coherence, we might expect the deformation to be always the same. Yet there are great differences found as regards the materials composing the projectiles and their mantles.

The Austrian, French, and Russian projectiles are made of hard lead (lead alloyed with antimony), the Belgian and German ones of soft lead. The mantle of the Russian and French projectiles consists of Melchior metal, whilst the mantle of the Austrian projectile is made of nickel steel. The Germans, Belgians, and Turks use nickel-copper bronze. The nuclei and mantles are all cylindro-conoidal in shape, the former fitting inside the latter.

Copper, German silver, and cupro-nickeled steel compose the jackets of the mantled projectiles with which we are most familiar in this country. In some recent experiments at Frankford Arsenal the maximum penetration in solid blocks of oak not thoroughly seasoned, fired across the grain at 3 feet from the muzzle, with a striking velocity of 2,000 foot seconds, the results were found to be as follows:

	Inches.
230 grain copper-covered bullet penetrated	4
220 grain German-silver-covered bullet penetrated	5.3
220 grain cupro-nickeled steel-covered bullet penetrated	19.5

The copper and German-silver-covered projectiles were very much deformed when recovered, whilst the cupro-nickeled steel retained its shape unaltered.

Since the velocity of the projectiles and hardness of the blocks were constant, we must attribute the difference in penetration to deformation.

The copper-covered projectile.—The use of the copper mantle has never met with much favor, and I believe Portugal and Italy are the only powers that have adopted it with the new armament. Owing to the ease with which it deforms its penetration as shown in oak is very limited. The yielding nature of the metal renders it necessary to cannelure and lubricate the mantle to prevent deposition of the copper in the steel barrel. The poisonous effects of copper on the tissues is another objection which has been advanced, and some of the writers on the subject have even gone so far as to claim that the use of copper bullets is contrary to the principles of the St. Petersburg convention of 1888, "that prohibits the use of arms which would uselessly aggravate the wounds of men placed hors de combat or that would render their deaths inevitable."

German-silver-covered projectiles.—On comparing the results obtained at Frankford Arsenal with the German-silver-covered projectile upon cadavers with those obtained by Bruns with the nickel steel of the Austrians I am led to believe that the penetration of the two projectiles is with possible preference for the nickel steel about the same. The nickel-steel mantle of the Austrians is the most yielding of the small caliber projectiles used by the foreign armies.

In our experiments at Frankford Arsenal with the German-silver projectiles upon ten cadavers 10 per cent of the mantles parted entirely from the nucleus upon colliding with resistant bone between the 100 and 200 yards ranges, whilst 50 per cent of the projectiles were more or less flattened at the conical end.

From experiments at relatively short ranges—between 17 to 25 yards—there is reason to believe that separation would take place in every instance of impact against resistant bone. The separation at these relatively short ranges showed destruction of the envelope into many small sharp fragments, stripping of the lead, and complete mushrooming of the nucleus, all of which add vastly to the explosive effects at short range.

Cupro-nickeled steel-covered projectiles.—As seen by the penetration in oak cupro-nickeled steel offers more resistance than probably any mantle ever tried so far. Although I can not quote from experiments on cadavers, it is doubtful if this mantle will ever part from its nucleus upon impact against any tissue of the human body, however resistant. If this be true, the addition of the cupro-nickeled steel mantle to the projectile of small caliber will make this the ideal bullet. As long as it possesses momentum its penetration will not be impaired by deformation at least.

The flattening which the conical end of the German-silver mantle so often sustains upon colliding with resistant bone impairs its future penetration and, it may be said, its integrity, for the chances are that upon striking another bone in a second individual as resistant as that traversed in the first the impaired mantle would rupture, a circumstance which would about arrest its work of destruction in men beyond the second individual hit. We may assume, then, that the fabulous stories told of the penetration of the small-bore projectiles, which enables them to traverse four men at 100 yards, can only be true of a projectile like that covered by cupro-nickeled steel, whose penetration and integrity are never impaired by alteration of form. It is evident, then, that any explosive effects to be noticed from the latter will in no way be due to deformation, and that its destructive effects within the explosive zone will be correspondingly less. In a military sense the effectiveness of the cupro-nickeled steel-jacketed projectile will be greater since it will have penetration sufficient to wound more men. In a surgical sense the projectiles of softer exterior, like those covered by German silver, will be more destructive, since upon colliding with the first or second resistant bone they will be destroyed on impact, and

the numerous fragments of the leaden nucleus and shell, each acting as a secondary projectile, will add to the work of destruction in the part hit. For this reason the stopping power of the German-silver-jacketed projectile will be greater on horses in a charge of cavalry upon foot troops. This statement is not made to disparage the effectiveness of the cupro-nickeled steel-jacketed projectile in this particular, because it is difficult to conceive how such a charge could be successfully made against any armament using the small projectiles of hard exterior, whether deformation is expected or not; but the statement is made to emphasize the fact that those projectiles which are apt to become destroyed on impact increase the explosive effects at close range, hence their superiority in stopping power. Because the stopping power in the cupro-nickeled steel is slightly less, some of the experimenters have been led to remove a small bit of the conical end of the casing sufficient to expose the lead in order to invite deformation on impact. This is an expedient which will doubtless be practiced in repelling cavalry, and also by the sportsman in hunting large game. The progress of civilization, so manifest in the use of the new armament, will hardly allow the employment of a projectile more deadly, if anything, than the murderous leaden bullet which we have just discarded, and it is to be hoped that the comity of nations will frown down any attempt to increase the destructive effects of the cupro-nickeled steel bullet in war.

As stated already, of the three factors which determine the amount of destruction in gunshot wounds, namely, velocity, resistance on impact, and deformation of the projectile, the first and second are pretty constant. If, now, we employ a mantle of indestructible hardness for the human body, like cupro-nickeled steel, for instance, the third factor will have been made constant, gunshot wounds will be more humane, and the results of observers henceforth will be more uniform.

GENERAL CONCLUSIONS ON THE SUBJECT OF GUNSHOT INJURIES BY THE PROJECTILES OF HARD EXTERIOR IN TIMES OF WAR.

1. The differences between the effects of the bullets of hard exterior and the leaden projectiles lie in the greater penetration of the first, and this in turn is due to greater velocity, diminished frontage, and the hard envelope which diminishes the chances of deformation.

2. For the two bullets, especially when a resistant bone is struck, the amount of lesions is in proportion to the velocity.

3. The shock impressed upon a member increases with the velocity, whether a bone is traversed or not. It is, however, always greater with the leaden projectiles.

4. The explosive effects at very short range are about the same for the two projectiles. They continue, however, up to 350 yards with the smaller projectiles and cease at about 200 yards with the leaden projectiles.

5. The smaller frontage of the hard mantle projectiles causes them to inflict something after the manner of a subcutaneous wound, when the soft parts alone are traversed, and the small wounds of entrance and exit and the narrow track of the missiles are favorable circumstances to a rapid healing.

6. Although we made no notes of injury to blood vessels, Johann Habart, royal and imperial surgeon, Austrian army, who mentions some observations in this line with the nickeled steel-covered projectile, states that "the blood vessels are seldom torn, and that they are not closed so easily by coagulation as those severed by leaden projectiles. The latter are more apt to bruise and lacerate the blood vessels, facilitating thereby the formation of thrombi. On account of the smaller aperture in the skin and soft parts the wounds bleed generally less than those made by the soft leaden bullets. The hemorrhage is easily stopped by coagulation."

7. A wound of exit, the diameter of a finger or thumb in area, indicates for either bullet fracture of bone with splintering, and in accordance with the observations of Delorme and Nimier, who experimented with the projectile of the Gras as compared with the effects of the Lebel projectile, tears of similar extent in the clothing are alike indicative.

8. Injuries inflicted outside the zone of explosive effects upon the diaphyses of long bones always show less comminution with the small bullets of hard exterior. The fissures are often subperiosteal and the fragments are larger.

9. Beyond the zone of explosive effects the projectiles of hard exterior almost invariably perforate or gutter the joint ends of bones, and the lesions of the articulations are never so grave.

10. The projectiles of hard exterior lodge more rarely in the tissues than the leaden bullets. The latter more often leave fragments of lead in the foyer of fracture.

11. Delorme and Nimier have noticed that the large leaden projectile and the smaller projectile of hard exterior detach pieces of clothing (cloth, linen, leather), which are irregularly round, varying in size with the frontage of the projectile.

The track of the wound in the soft parts is generally paved by fine filaments, whilst shreds are often found arrested at the seat of fracture.

12. The projectiles of hard exterior are more humane than the old. Resections and amputations will not be so often required hereafter. Soldiers will be more often restored to the State useful members of the community instead of cripples and pensioners, and in point of economy the new projectiles confer a great advantage.

13. As the projectiles of smaller caliber with hard mantles are less apt to lodge or to carry foreign substances into the wounds, we will expect to find fewer cases of suffering due to the remote effects of unextracted foreign bodies. This, we should bear in mind, is one of the most frequent sources of protracted suffering after gunshot wounds.

14. The frontage of the new armament bullets being much less, and the fact that the bullets seldom lodge, will contribute to increase the percentage of recoveries in gunshot wounds of the lungs, and this will be especially true in the wounds of this class which may be inflicted beyond the zone of explosive effects.

15. When the new bullets do become lodged they will be less apt to cause irritation for two reasons—they are lighter in weight and seldom deform.

16. Wounds of the face from the new projectiles will cause less disfigurement.

17. Fatal primary hemorrhage in the field. There are no statistics bearing on the percentage of cases of fatal primary hemorrhage in battle, because, as a rule, the surgeons are so busy in caring for the wounded that there is no time to devote to the dead, but it is generally admitted that the number of cases of fatal primary hemorrhage is large. When the leaden projectile encounters resistant bone pieces of lead are nearly always detached at the moment of impact. If the momentum of the projectile is still sufficient the pieces of lead and splinters of bone act as secondary projectiles, and the danger of wounding neighboring vessels is consequently increased. Since the new projectiles, outside the zone of explosive effects especially, cause less shattering, and, as they seldom deform, the amount of danger to blood vessels will not be so great, hence the cases of fatal primary hemorrhage in future battles will be less.

18. All things considered it is doubtful if there is just ground for the pessimistic view held by some that the wars of the future will be much more deadly than ever before. The change from the smooth-bore gun and spherical bullet to the rifle and cylindro-conoidal bullet increased the number of wounded vastly and added to the severity of wound. Owing to the employment of smokeless powder, a flatter trajectory, and greater penetration, the change to the smaller jacketed projectiles will increase the mortality and number of wounded still, but the wounds as a whole will be less grave—more humane. If we consider the latter with the improved sanitation which will surround the soldier of the future, as well as the surgeon's ability in the application of his primary dressings to prevent infection, I believe we may confidently assert that the horrors of war as depicted by the older writers will never again be seen.

Having been designated by the Secretary of War, about two years ago, to preside over the medical section of the War Department exhibit at the World's Columbian Exposition, I conceived the idea at the onset of the work at Frankford Arsenal of preserving the specimens of bone lesions and the missiles producing them as a collection to be exhibited among the articles to be displayed from the Army Medical Museum. I am happy to state that sixty-seven specimens and their corresponding projectiles are now on exhibition, and that they are eliciting great interest. I am indebted to Dr. Guy Hinsdale, of Philadelphia, for their preservation and for much assistance in securing accurate information concerning the destructive effects of the missiles, in the bony structures especially. The photographic plates were prepared by Hospital Steward John Moser, U. S. Army.

THE SANITARY CONDITION OF THE ARMY.

The sanitary reports furnished monthly by post surgeons in accordance with the requirements of Army Regulations (Par. 1642) are of the utmost practical value in leading to the accomplishment of sanitary improvements. No form for this report has been issued from this office, so that medical officers are generally free to follow their own views as to the best method of presenting their opinions and suggestions, but in some of the military departments medical directors have issued a form which presents certain prominent sanitary headings to insure that no material point will be overlooked.

There is an inherent tendency to routinism in the rendition of all papers that have to be furnished regularly and at short periods, but this tendency is never so great in the case of these reports as to prevent due notice being taken of any serious sanitary evil. Once embodied in the report the evil is certain to receive full consideration, and in fact in the majority of cases it may be considered as already remedied, for the regulation cited provides for an almost automatic action against it. The recommendation is submitted first to the post commander, who indorses his action on the report, and before forwarding it to higher authority sends it back to the medical officer for his information and for entry in the Medical History of the post. Should the commanding officer concur in the recommendation of the medical officer and have at his command facilities for carrying it into effect, he issues the necessary orders in the case. If while concurring he should lack either the authority or facilities for effecting the change the recommendation is forwarded for the consideration of higher authority. On the other hand, if the commanding officer disapprove of the suggested change he is required to state the reasons which have influenced him that the department commander or the War Department may have a full knowledge of the facts and arguments concerned.

The question whether a post surgeon should report a second time against insanitary conditions and repeat recommendations that have already been unfavorably regarded by his commanding officer was raised during the past year. The Major-General Commanding, after a careful examination of the case, decided that the post commander "fell into a manifest error in condemning the action of the post surgeon in calling his attention for a second time to what the surgeon considered insanitary conditions of the post. It was not necessary that the commanding officer should make an elaborate explanation why he could not conform to those conditions unless for the information of higher authority. It might well be assumed that the post commander would do the best he could under the circumstances, but he ought not to complain because the surgeon, in the commendable desire to do all that was possible for the health of the command, ventured to call his attention to the subject a second time."

These sanitary reports filed in the office of the Surgeon-General constitute a sanitary record of each of the posts. From the reports of the past year the following remarks on present sanitary conditions have been compiled:

QUARTERS.

Great improvements have been made during the past few years in the character of the quarters provided for the Army, and the officers of the Quartermaster's Department are entitled to great credit for their earnest and intelligent efforts to have all work of this nature carried out in accordance with advanced sanitary views. Nevertheless it appears to me that when any important work of construction, alteration, or repair is under consideration it would be well to have on record the views of an officer of the Medical Department on any sanitary questions involved. In many instances the medical officer has a special knowledge of the locality in its sanitary bearings that is too valuable to be overlooked. I desire, therefore, to urge the recommendation made on several previous occasions by my predecessors in office, that the plans of all buildings hereafter to be constructed, of alterations to be made, or of sanitary improvements to be instituted at our military posts be submitted to a

board of officers, one member of which shall be a medical officer. The construction and improvement of our military posts are matters of so much importance as to merit consideration by boards of officers before commencing work on plans drawn up by an individual. Moreover, on account of sanitary considerations connected with selection of site, construction of barracks and other post buildings, with their heating, lighting, and ventilation, drainage, sewerage, and water supply, the Medical Department should be represented on such boards. It is better to build well from the first than to have to make alterations in a completed structure, for these are always expensive and seldom satisfactory. Indeed the defects are sometimes so radical that no remedial measure other than reconstruction is possible. Col. J. C. Baily, assistant surgeon general, commenting recently on the sanitary conditions of Fort Sam Houston, Tex., makes the remark: "It would not be possible to select in the vicinity of San Antonio a worse site for a post than that on which Fort Sam Houston is built; and the worst spot on the reservation was selected for the barracks. So far as I can learn the usual custom of not consulting any sanitary officer was adhered to in locating and planning the barracks." The approval of a board before final action is taken would tend to eliminate mistakes and lessen the need for future changes.

The sites of some of our military posts are open to criticism on account of their environment. Thus, Jackson Barracks, La., irrespective of its high-ground water level, is objectionable on account of the slaughterhouses and rendering establishments in its neighborhood. The location of the recruiting depot, Columbus Barracks, in one of the wards of the city of Columbus, is the cause of the high rate of sickness and nonefficiency from venereal diseases among the newly-enlisted men.

Overcrowding of the men in quarters was reported from a few posts, such as Forts Columbus, Sully, and Grant, and Columbus Barracks. At the first-mentioned post Maj. Hoff attributed a sickness somewhat beyond the normal to overcrowding and deficient ventilation, and instituted temporary relief by boards 6 inches wide, to raise the lower window sashes. He recommended that plans be formulated for adequate ventilation of the squad rooms. At Fort Grant, Capt. Birmingham attributed the prevalence of sore throat and malaise among the men to overcrowding and defective ventilation of the dormitories. He found only 500 cubic feet available per man, and reported the odor at night as intolerable. Measures were immediately taken to improve the conditions at this post. At Fort Sully, also, at one period, two of the barrack buildings were overcrowded. Generally this overcrowding of dormitories is merely temporary, due to an accidental increase in the garrison. This is especially true of the recruiting depot at Columbus Barracks, where the seasonal variation in the number of recruits received is very marked. Recruiting is more active in the severe weather of winter than during the summer. The average monthly number joining the garrison in December and January was 180; during the summer only 115.

The buildings at a few of the posts are old, dilapidated, and leaky. The makeshift sanitary arrangements at Fort Keogh should not be permitted to continue unless the post is likely to be abandoned in the early future. Among its many needs are roomy and well-ventilated quarters for the troops. The best of the officers' quarters at Eagle Pass, that occupied by the commanding officer, is not so good as the quarters ordinarily provided for a noncommissioned officer at any other post. The quarters of the men have ample space and good ventilation, but

the roofs leak and the walls have to be propped to prevent them from falling outwards. All the occupied buildings at Fort Custer are old, with the exception of one set of quarters and the guardhouse. The barracks, particularly, are much dilapidated; they can not be kept comfortable in winter. As the abandonment of Fort Whipple has been in contemplation for some time few repairs have been made to the buildings, and the post presents a worn and dilapidated appearance. The buildings are wooden, decidedly overcrowded, and ventilated only by the doors and windows. With few exceptions, all the buildings at Fort Yates are old and poorly adapted for the purposes for which they are used; but they are in as good sanitary condition as it is possible to have them, in view of the uncertainty as to the continuance of the post. The barracks are loose-jointed and cold in winter, permitting the entrance of cold winds and snow. Storm doors and double window sashes were provided on the recommendation of the post medical officer.

Perhaps the rudest and poorest accommodation for officers and men to be found in the Army are met with on the Indian reservation at San Carlos. The officers' quarters consist of small, two or three roomed adobe huts, with a rough frame structure behind for kitchen and dining room. On the opposite side of the parade ground are eighteen pine-board shells 32 by 16 by 18 feet, shingled, but without lining or ceiling. These have no windows, but a strip of canvas 4 feet wide takes the place of the boards in the upper part of each side wall. The light admitted is not sufficient to enable the men to read with comfort. The orderly rooms, kitchens, and dining rooms are of canvas. Three sets of officers' quarters are occupied by the noncommissioned staff and their families; but most of the married soldiers live in such quarters as they can construct for themselves, usually of brushwood and old canvas. These quarters afford protection against neither the excessive heat of the long summer of Arizona nor against the cold nights of its winter months, when the temperature drops as low as 11° F. It is understood that the consent of the Interior Department to the withdrawal of the troops from the agency has been requested.

SAN CARLOS, ARIZ.—*Lieut. P. Shillock:* The officers' quarters are small but in good repair and satisfactory. The enlisted men's quarters are very poor. They afford only a slight protection from the weather. During the summer they are exceedingly hot. Upon trial I found the temperature 110 degrees inside of one of these quarters, and in general it is only 2 degrees lower than that of the thermometer in the latticed box in the hospital grounds. In connection with this I would respectfully call attention to the extremely high temperature at the post during the summer as shown by our meteorological report. For the four months, June, July, August, and September of last year the mean daily maximum was above 100° F. One month it averaged above 110° F. The records of the preceding year show even higher temperatures, the highest being 117 degrees in the shade. Shortly after sunrise the thermometer runs up nearly to the maximum, and only drops to any appreciable extent about sunset. This high temperature every day for four months at a stretch is very hard to endure, as the quarters the men occupy afford only the slightest protection from the heat. On the other hand, the adobe quarters of the officers afford a most appreciable and gratifying protection, lowering the temperature as much as 20 degrees. In stepping from the adobe portion of an officer's quarters into the wooden portion behind a very decided difference in the heat is at once apparent.

In the winter the men's quarters are again a poor protection against the cold. Although San Carlos is scorching hot during the summer days it is bitter cold during the winter nights. Our minimum temperature shows the average daily minimum for three months to be below freezing, the lowest recorded being 11° F.

On account of the poor material used in building the men's quarters large cracks and holes exist in all the buildings, making them very drafty. Their equal heating is impossible. A hot fire in the center will warm the immediate vicinity, leaving the remainder cold and drafty. A much larger amount of fuel is required to heat these quarters than would be required to heat better-built quarters.

San Carlos is afflicted with many severe dust storms, each usually lasting about three days. During one of these the men in their quarters, with canvas sides and numerous cracks and holes in the walls, are literally covered with dust and remain so during the whole storm.

If it is contemplated to provide suitable barracks for the men stationed here I would recommend thick-walled one-story adobes with low, wide verandas and double roofs, so that the air may circulate between the roofs and keep the buildings cool. In this connection I would also call attention to the great desirability, when making plans for these buildings and putting them up, to provide for good ventilation by a sufficient number of inlet shafts under the floors, opening under the stoves, and ridge outlets.

At present, for want of other quarters, three of the twelve sets of officers' quarters are occupied in part at least by noncommissioned officers. The laundresses are put in the poorest kind of quarters, tents made out of condemned canvas. Suitable adobe buildings, either in double sets or all under one roof, are greatly needed for the noncommissioned officers and married enlisted men.

The extract given above from Lieut. Shillock's report on the condition at San Carlos brings to view the oppression and strain on the vital energies caused by prolonged hot weather at some of our posts in Arizona, New Mexico, and southern Texas. Capt. Pilcher wrote of similar conditions at Fort Ringgold as follows:

This post has long been notorious as the most undesirable station in the Department of Texas, if not in the entire Army, because of the long-continued heat and drought to which it is subject. In the heated season, which extends from March to November, life is hardly endurable to the Caucasian except in rooms of sufficient height to contain air enough to afford free respiration and to admit of a sufficient mass of air between the body and the roof upon which the rays of the sun strike. The second story rooms of the officers' quarters have long been the source of excessive discomfort, unquestionable suffering, and considerable illness. Only 9 feet high at their loftiest altitude, they run down to 4 feet at the sides. The windows are perched in the roof or high in the gable, so that even the breath of air which their small size might permit to pass can hardly reach the unfortunate inhabitant. The process of slow roasting is sufficiently uncomfortable in itself, but when suffocation is added the strain upon human endurance is rather severe. I don't think I am exaggerating when I say that these low-ceiled rooms have been productive of more suffering, discomfort, discontent, and profanity than any other single feature of the post. The expense of raising the roofs of the officers' quarters to two full stories will be slight compared with the great advantage that will accrue to the occupants. Upon hygienic and climatic grounds I warmly urge that this be done.

The above extracts represent the discomforts sometimes attaching to military service in the West. The insanitary equivalent of the pine-board barracks of San Carlos is in the East the casemates of our harbor fortifications. Many of these are still in use, as at Forts Warren, Wadsworth, and Adams, although every medical officer stationed at these forts has reported against the occupation of their casemates as quarters. They are damp and cold, and would cause much sickness if fires were not kept in them constantly. Arms rust in them, leather becomes moldy, and clothing and equipments decay. In summer when there are no fires moisture bedews the interior of the walls and trickles to the floor. Gen. Warren, in 1874, gave a satisfactory explanation of this excessive dampness. The casemates are arched with brick, the arches covered with sheet lead, and the valleys between them filled in with earth. A thin layer of concrete with a brick pavement over all completes the roofing. The weight of the covering above the lead presses the hard parts through the sheet metal, and thus permits water to reach the arches and soak from the valleys into the interior of the casemates. Moreover, in winter the casemates become chilled throughout and retain a low temperature far into the summer, as has been shown by the presence of ice in the valleys when uncovered for repairs. The moisture of the warm air of summer entering the casemates is immedi-

ately condensed on the cold walls. Nothing other than Gen. Warren's description is needful for their condemnation as living and sleeping rooms.

The guardhouses of the Army have participated in the general progress of improvement so that complaints from medical officers, formerly so frequent, of their insanitary condition are now exceptional. During the past year such complaints have come only from Angel Island, Davids Island, and Madison Barracks. At the first mentioned post the room for the guard is reported as so small, uncomfortable, and infested with bugs as to make a tour of guard duty almost a punishment. At the second the guardhouse is represented as destitute of all the features essential to the health, cleanliness, and comfort of the inmates and insusceptible of satisfactory alteration or repair. Estimates have in this instance been prepared for a new building. At the third the prison room is 20 by 18 feet, with but one window and an average occupancy of 6.6 men; cells cold, dark, and damp, with the only aperture for light 12 by 3 inches. In this instance, also, favorable action was taken by the department commander in directing that the subject of a new guardhouse be embraced in the annual report of inspection of public buildings.

The quarters occupied by married enlisted men at some of our posts are wholly unfit for occupancy. Reference has already been made incidentally to those of San Carlos. Those at Fort Yates are described as wretched. Casemates are occupied at Fort Warren where from the chill, dampness, and bad air the children are anæmic and show signs of rachitis. At Fort Grant these quarters are in bad repair and crowded to the point of indecency. At Fort Vancouver they are reported as scarcely habitable, built on ground honeycombed with disused privy pits and cesspools. At Fort Missoula the old log huts thus occupied should be destroyed, as also some shanties owned by a civilian and rented to married soldiers. The best of these, constructed by the soldiers for themselves and families, at Fort Du Chesne, are of logs, but most of them are of scrap lumber eked out with condemned canvas and old coal-oil cans, the rooms without flooring, small, damp, and dark. Sanitary improvements can not be instituted at the expense of the occupants, and at present there are no means for effecting them in any other way. Quarters like those at the posts mentioned are breeding places for disease; and as garrisons become larger the problem of quarters for the married soldiers is likely to become more complex. I recommend a return so far to former methods as to provide public quarters for a limited number of married men in each organization, all others being strictly prohibited from having their families at the post. A provision of this kind would be regarded as a privilege awarded to deserving soldiers, and would permit the whole of these huts and shanties to be destroyed.

FORT WARREN, MASS.—*Capt. P. R. Egan:* Twelve months ago last March the quarters of the married men situated outside the fort were pulled down and the families sent to live in basement casemates. This fact has added a grave sanitary defect to this post. In my report for September, 1891, I thus alluded to their condition: "They are situated in basements into which the rays of the sun scarcely ever gain admittance. * * * Add to this the inevitable dampness of basement casemates, the bad hygienic conditions arising from cooking, washing, and living in a couple of rooms, and no one will wonder that the young children are anæmic and beginning to show evidences of rachitis. * * * I repeat, that they are not fit to live in, and that so long as people live in them, as they do now, this post can not be put in a good sanitary condition, and would be little better than a pest house in case of an attack of cholera. The engineers' boarding house, to which attention was called in a recent special report, is dirty, overcrowded, and unsani-

tary. They are both equally a standing menace to the safety of this garrison in case of an attack from cholera."

On the other hand, from certain northern posts came reports of intense and continued cold, against which the clothing issued by the Government was inefficient as a protection to the person and the allowance of fuel inadequate to properly warm the barrack rooms. When the thermometer was at —54° F. at Camp Poplar River, in February, the barracks, built of logs placed upright in the earth, were so poorly heated that the men wore their overcoats in bed, and in many cases left their beds during the night to sit by the stoves; the hospital cook performed his duties in his furs; the wards at night were often below zero, and a servant in the kitchen of one of the officers had one of her feet frozen while at her work.

To illustrate similar conditions at Fort Assiniboine, the post surgeon reported that ice formed in a sleeping room within 4 feet of a coal stove which was kept heated with burning coal during the night. The medical officer at this post took exception to the fuel in use, and particularly to its use in hospital. He reported it as of an inferior quality of lignite, crumbling on exposure, and in burning leaving a large residue of ash, slate-like masses, and slag. Its fires required constant attention and gave origin to clouds of fine dust, which floated in the atmosphere of the rooms and settled on everything, doing much harm in diseases of the respiratory organs, which are the usual cases in hospital in severe weather. A return to the use of hard coal was recommended and effected. Capt. Clendenin, at Fort Brady, also reported on the inadequacy of the allowance of fuel, and referred to the injustice of the present laws governing the sale of fuel to officers. An officer exposed to all the rigors of a severe winter by his assignment to duty at such a post as Fort Brady has to expend from $12 to $18 per month for fuel to keep his quarters comfortably warm, while his more fortunate comrade, stationed in an equable climate, is exposed to neither the inclemencies of the season nor the expense of endeavoring to protect himself and family against them. I commend this subject to the consideration of higher authority, giving herewith an extract from Capt. Clendenin's report:

I gave my personal attention to the economical use of fuel both in my own house and at the hospital, and I was astonished at the amount of fuel necessary to warm the buildings. In my opinion the quarters occupied by officers should be properly heated at the Government expense. At present there is too great a discrimination between officers serving North and those serving South in the way of necessary expenses. To make my meaning plain, permit me to allude to my own experiences: While serving in the Department of Texas my fuel expense amounted to about 75 cents per month for the trifle of wood consumed in cooking and an occasional heating fire; since serving in this department it has been with the closest economy that my total allowance has sufficed. It seems to me to be unjust that while an officer serving in Texas can pass the winter in comfort on an expense of 75 cents or $1 per month, one serving at this post should be compelled to spend $12 or more to keep warm. During the past month there was burned in my quarters over 10,000 pounds of anthracite coal, and none was wasted, for I appreciated the difficulty of warming the men's quarters and kept an eye on the consumption of coal. So that I burned in my quarters last month $18 worth of coal as against 75 cents or $1 in Texas. Had I not had a supply of coal purchased in former months, in anticipation of this increased consumption in the new quarters, and had I paid for the coal used in excess of my allowance at current market prices, my coal bill would have been $22. You will pardon the personality of this in referring to my own affairs, but I can speak with greater exactness. Every officer at this post has exceeded his allowance in the amount of fuel the past month, and it seems to me a hardship that it should be so. If it is not deemed expedient to make such issue of fuel to officers as I have suggested, it seems to me no more than fair that officers should be allowed to purchase at present rates all the fuel necessary for use in their quarters upon their certificate that it is for their own use, in precisely the same manner that commissary stores are purchased and with no more limitation.

Some medical officers in their reports call attention to the practice of flushing the floors of quarters, dormitories, dining halls, and other occupied rooms. At many posts this method of cleaning up is regarded as an indispensable preliminary to inspection of quarters. It has long since been given up in the Navy on the sanitary principle that a damp ship is an unhealthy one. The same principle applies to barrack rooms. It is important that the soil beneath the flooring should be kept as dry as possible, and this can not be effected if water is flushed on the floors and permitted to run through open seams or broomed into knot holes or auger holes specially bored to permit of this method of disposing of the wash water. One medical officer, in view of such practices, felt called upon to report to his commanding officer that—

> The barracks having been for the most part newly floored during the month, I recommend that positive orders be given that no auger holes be bored through these floors for the purpose of allowing water that has been used for cleansing purposes to escape beneath them.

Another medical officer states that he has served at posts where the men had the alternative of staying in quarters with a thoroughly wet floor or going out of doors with two feet of snow on the ground and the thermometer at zero. As catarrhal and rheumatic affections are prone to be developed by flushing, commanding officers should prohibit the practice. Floors when lightly stained and waxed can easily be kept clean, dry, and wholesome.

The mosquito was reported at one post—Key West Barracks—as a pest, against which the protection of wire screens was recommended. The post commander indorsed the recommendation of the post surgeon in these terms:

> If the men can neither sleep in peace nor eat in even comparative comfort their poor ration they are apt to grow reckless and seek relief, or rather oblivion, in drink, regardless of the consequences that may ensue as to health. The mosquito is always here from New Year's Day to St. Sylvester's. He is always active, always an annoyance; but if he continues during the coming four months as during the past one, especially the past week, we will scarcely care to guard against yellow fever; there is some credit in having to deal with that.

The house fly at certain western posts is almost as much of a pest as the mosquito appears to be at Key West. Wire screens were recommended as a protection at Yellowstone. The following is from the report of the post surgeon for the month of March:

> I am informed that among the many improvements embodied in his annual estimate by the post quartermaster is an item for door and window screens for barracks and quarters. I would heartily recommend the approval of this item, not as a luxury but from a sanitary point of view. Never have I seen flies in greater number than at this post during my one summer here. In my own kitchen meat has more than once been fly-blown after having been taken from the ice box and before it could be prepared for cooking. It has long been known that the bite of a fly was capable of innoculating with the virus of malignant pustule, and recent experiments tend to prove what has long been suspected, that the insect in question is capable of conveying the germs of cholera and other diseases.

The quarters provided for the Indian companies were in some instances only makeshift accommodations. At Fort Sidney their barrack room was so crowded as to call for the recommendation of tents to relieve the dormitories. At Fort Omaha the tents in use were represented as old, torn, worthless, all dirty, and some filthy. At Fort Snelling an old, unventilated, and disused prison was fitted up for their occupancy. The crowding in barracks no doubt increased the consumptive tendency to which the Indians are so prone when they give up their wild life for a semicivilized mode of living. All the re-

ports refer to the difficulty of keeping them clean and to their habits of intoxication. The occurrence of injuries and deaths in drunken quarrels at Forts Wingate and Bowie has already been mentioned. The following extracts give an idea of the quarters and habits of these men:

FORT SIDNEY, NEBR.—*Capt. L. S. Tesson*—January: I invite attention to the crowded condition of I Company quarters and recommend that the number of beds in the main dormitory be reduced to 20. With the present number of occupants no man has sufficient floor space for comfort and less cubic air space than is accorded in any well-regulated lodging. The Indians occupying these quarters being accustomed to an out-of-door life, and to sleeping either under tentage or in the open air require more air space than their more civilized brethren, and must necessarily be much incommoded as far as their health is concerned by this cramped condition. Moreover, the race being much afflicted with diseases of the lungs, a given quantity of air would much sooner become contaminated through them than if breathed and exhaled by men of different constitutions.

As the ventilation of the room can not be improved upon for the present it would be the part of wisdom and economy to so increase the amount of air space per man as to diminish as far as possible the contamination due to exhalation from the bodies of the occupants, and I therefore recommend that, if no other building is available in which a portion of the company can be quartered, one, or, if necessary, two hospital tents be pitched in close proximity to the said quarters, framed and floored, and such number of men as will reduce the occupancy of the main dormitory to 20 be ordered to quarters in the tents.

The small dormitory in its dimensions allows of a fair amount of air space per man, but as there is no ventilation except through two windows it would be well if the occupancy of this room were reduced to 4.

The little room off the kitchen now accommodates 2 men with sleeping quarters. One of these men should be removed, as the room lacks ventilation except through one window.

February: The recent death of one of the Indians from consumption and the indisposition of a number of others with chest troubles would seem to emphasize the necessity of the changes advocated in report of January last, and as I am informed by the post quartermaster that the material for completing the changes resolved upon has not yet all arrived, I would recommend that such representations be made to headquarters as will expedite the shipment of the material still needed to render that company comfortable from a sanitary point of view.

FORT OMAHA, NEBR.—*Maj. A. Hartsuff:* I found several families of Indian soldiers who are permitted to live at this post in a deplorable condition. Their habitations are old worn out tents, so full of holes that they do not protect from the storms. There is no flooring to their tents and no boards inside nor about them. Each family of man, wife, and children is supposed to have one tent, such as it is, but in one case the tent is so old, torn, and worthless that the family to which it was assigned is generously taken in by another family. Their water-closet is a pit covered by an old "A" tent, and is so nearly full that a new pit should be dug at once. All of the tents are dirty and some are filthy. I refer to the tents as habitations, and as the married Indian soldiers are permitted to live with their families the tents are their authorized quarters. As several of the occupants of the tents are now being treated, and as all must be cared for if sick, I respectfully recommend that if they are allowed to remain at this post suitable quarters and accommodations be provided for them, after which they should be required to keep themselves and their surroundings clean and in good hygienic condition.

Lieut. Col. Dallas Bache, medical director: Respectfully returned to the Adjutant-General of the department, calling special attention to the condition of the Indian families as reported by the post surgeon. The houses and grounds at Fort Omaha should be put into as good a sanitary condition as possible during the present and ensuing month, and if it is necessary there should be an allowance of funds for that purpose. Whether Asiatic cholera will be introduced into this country this summer we do not know, but the relation of this post to this city is so intimate that every effort should be made to secure an unproductive soil at this post.

FORT SNELLING, MINN.—*Maj. C. K. Winne:* Attention is respectfully invited to the barrack accommodation of the Indian company. The police of the men and of the building is excellent, but the conditions under which this company lives are in every way as inconvenient and bad as I have ever seen. When the old prison now occupied by this company was abandoned it was considered that one source of disease was done away with. The building is not adapted to its present use; the rooms are badly lighted; no ventilation except through windows, and no provision for the escape of foul air, while the number of men in each squad room results in overcrowd-

ing. The ventilation would be improved by introducing ventilators in the ceiling, but these should connect with shafts running above the roof and not into a common roof space, because, besides "producing down drafts, openings of this kind, communicating with one reservoir of stagnant air common to a number of rooms, may, by the irregular action of the fires, supply the rooms with each other's foul air." Boxes were fitted up in an old wooden building as temporary earth closets, but seepage has commenced and the arrangement is only of the most makeshift kind. The facilities for bathing are very crude. Water heated on a stove has to be carried to the temporary bath tub, which is again emptied into pails, carried away, and thrown on the ground near by. No sinks can be dug here now, and none should be, as the old ones, which were in use when the former garrison suffered from typhoid fever, have been done away with, and there is no sewer system in this part of the garrison for water carriage. Unless proper quarters can be furnished for this company I earnestly recommend that it be transferred to some other post where it can be placed in better sanitary condition, or if that can not be done, the men had better be put into permanent camp in the upper garrison, with the use of the bathroom, and especially the use of the water-closets of one of the white companies.

Assistant Surg. Gen. C. H. Alden, medical director: It is recommended that unless some other disposition is made of this company estimates be prepared for such alterations in the barracks as will secure freedom from overcrowding, ample light and ventilation, and for proper bathing facilities and good water or earth closets.

FORT NIOBRARA, NEBR.—*Capt. Benj. Munday:* On the 18th of April a case of facial erysipelas occurred in the barracks occupied by Troop L, Sixth Cavalry (Indians). This was followed by three other cases. The first, second, and fourth cases were superficial and easily yielded to treatment, the average duration being eighteen days. Case third assumed a phlegmonous form from the beginning, and extended over the entire trunk, with œdema of the glottis, causing great difficulty in breathing and swallowing. It progressed favorably till May 17, when pneumonia supervened, involving the whole of the left lung and upper lobe of the right lung. Death occurred on May 20. After a thorough investigation it was supposed that the outbreak was due solely to the naturally filthy condition of the Indian for no case occurred amongst the white soldiers, although they occupied barracks in every way similar to those used by the Indians. The troop was put in tents and the entire barrack disinfected and whitewashed. Since that there has been no other case.

FORT BOWIE, ARIZ.—*Capt. R. W. Johnson:* The habits of the men belonging to the Indian company at this post are not satisfactory. There has been entirely too much drinking the past two months; but this is not surprising, as liquor in unlimited quantities can readily be obtained from a few neighboring ranches. As a consequence intoxication is common. Brawls are frequent, and if they were only allowed to retain possession of their arms it would be but a short while before their number would be materially decreased. The presence at this post of nineteen squaws, who are filthy beyond description, seriously militates against any progress towards civilization that might otherwise be made by the members of the company. It would certainly be no detriment to the service or to these men if their squaws and families were sent back to the reservation at San Carlos.

Another feature which calls for earnest criticism is their lack of cleanliness. Proximity even to these men makes this fact very apparent. The odor emanating from them is sickening, and arises from a neglect of personal acquaintance with frequent bathing. Strict orders were issued by their company commander that each man should bathe at least twice a week; but this order is evidently disregarded. Previous to enlistment it was not customary for these Indians to bathe during the winter season, and it is not surprising that difficulty is experienced in endeavoring to make such a radical change in their habits. In making an inspection yesterday of the bathroom of this company a large hole was seen in the bottom of one of the tubs, which appeared as though made by the sharp edge of a hatchet. From the well-known dislike to water manifested by these Indians it is fair to presume that this injury was not the result of accident.

Maj. D. L. Huntington, medical director: Great difficulty has been experienced in keeping the Indian soldiers clean and free from vermin. Their habits are not good, and they are hard to control.

FORT WINGATE, N. MEX.—*Maj. W. Matthews*—July: The habits of the men, particularly the members of the Indian organizations, have not been good. One homicide and one death from accident, both results of intoxication, have occurred among the Indians during the month.

December: The habits of the men have not been good. Five members of the Indian troop suffer from wounds received during the month resulting from drunkenness,

DRAINAGE, SEWERAGE, DISPOSAL OF GARBAGE, ETC.

Drainage.—Few of the sanitary reports from our military posts enter into details of the drainage; and as a matter of fact there is at many of them little to be said on the subject, as the inclination of the surface in some direction suffices to carry off the rainfall, or the superficial beds of sand and gravel are so deep that surface water does not lie and the level of the subsoil water is too low to be regarded as an insanitary factor. At some posts the natural drainage is aided by shallow ditches, covered or uncovered, leading into neighboring ravines. Where such ditches exist kitchen sinks, bathrooms, and urinals are generally connected with them in the absence of a systematic sewerage system for the proper disposal of these liquid wastes. At many of the Northern posts the frosts of winter seal the ground and put a stop to all surface and subsoil drainage. Heavy snowfalls cover up garbage and other refuse that may be thrown out and prevent any systematic policing of the surface for four or five months. When the snows melt in the mild weather of returning spring the accumulated foulness is brought to view and the post, if inspected at this particular time, would not show to advantage. The usual remedy in this case is to turn out the whole strength of the garrison for thorough general police from day to day until this spring cleaning has been effected.

The following report by Capt. Paul Clendenin, Fort Brady, Mich., gives a view of a Northern military post during the period of spring thaws:

The drainage is by means of underground sewers and is efficient. At present the rapidly melting snow is causing the collection in places of a great deal of surface water, but this is being remedied as far as possible by trenches cut through the snow banks by the police parties to carry the water off. Many of the collections of water are due to depressions in the surface as well as by being shut in by the unmelted snow. A great deal of the ground has been graded artificially, and this new earth has settled unequally. This can easily be corrected when the snow disappears. The snow banks along the sidewalks are still shoulder high in places, and occasionally these banks act as dams, though for the most part the water is passing off under the snow. In a few of the cellars a little water has appeared, coming in through the walls. The ash pits of the barracks and the hospital, being lower than the tile drains around the foundation walls, require bailing several times daily whenever there is thawing weather. The strong winds for the past few days have done much to rot the snow, as it is termed in this country. Dry winds, with a temperature a trifle above freezing, honeycomb the snow banks and cause them to sink very rapidly. The consequent saturation of the atmosphere with moisture renders this a most fertile season of the year for colds, neuralgia, and rheumatism. The colds resemble those seen in a malarial district and yield, if taken in time, to moderate doses of quinine. There is the general lassitude, soreness all over, injected eyes and stuffiness of the head, that the laity are so fond of calling "grippe," accompanied usually with some febrile reaction. In my opinion this condition of the system is due to breathing air saturated with moisture that has carried off mechanically decomposing organic matter. During the winter in this country there is no drainage save the house drainage into sewers buried deeply in the ground. Everything on or near the surface remains frozen up for at least five months of the year. All filth thrown out of the houses and the droppings of animals in the streets and all the impurities washed out of the atmosphere by the almost daily fall of snow are buried by the snow more or less mingled with it. In this condition the impurities are practically harmless during the winter months, but in spring this accumulation is exposed as the snow melts; some of it runs off in solution with the surface water and some is carried off mechanically with the evaporating moisture, but the greater part of the remainder putrifies as the weather becomes warmer, unless removed by scavengers. The drainage of the new post is so excellent and the police has been so efficient that there will be but a small residue to be removed when the snow has disappeared. At the old post it will be necessary to remove the snow and ice near the buildings by shovels and carts. It is all impregnated with refuse matter, and the buildings shade the snow in their immediate vicinity so effectually that, except on

the south side, it is late in melting. This is especially true where it has drifted against the buildings in the narrow spaces between the barracks and mess rooms and bathrooms and in rear of the old hospital and the officers' quarters.

During the past year special notes were made of the drainage of only four posts. At Fort Assiniboine exception was taken to the drainage in the immediate vicinity of the barracks and underdraining into a cesspool was recommended, but this was overruled by the medical director, who considered that the object could be better accomplished by grading and surface drains. At Fort Du Chesne the drainage from the surface is upheld in the subsoil by an impervious stratum at the depth of 10 or 15 feet, so that the site of the post is practically a huge cesspool, which receives the leachings from a vast number of privy pits disused and in use. This cesspool is said to have only two outflows, one on the bank of the river near the hospital and the other in the cellar of the subsistence storehouse. Capt. S. Q. Robinson's report of this singular condition of subsoil drainage is worded as follows:

In a previous report attention was invited to the fact that the post is underlaid to a depth of 10 or 15 feet by a stratum impervious to water, and that the evils of soil occupancy would sooner or later be felt. The increased vigilance rendered necessary by the possibility of cholera leads me to recur to this subject. Tons and tons of stable manure have been carted on to the parade and the road surrounding. Outside of the buildings which inclose this area is a cordon of privy vaults, 33 in number. Liquids drain rapidly away from these. The stable manure is leached to some extent by the infrequent rains, and very thoroughly by the free supply of water from the numerous irrigating ditches, the passage downward of the resulting solution being arrested at the depth above stated. This gigantic cesspool at present has two outlets, one on the bluff bank of the river near the hospital, the other in the commissary cellar. At this season, when the ditches are frozen up, the cellar does not have to be pumped out very often, but in the irrigating season, *i. e.*, when water will run, the floor is frequently covered to a depth of 3 or 4 inches. Without irrigation and manuring the post would become the desert that it was originally. Regarding these as necessary evils, the problem is to limit their power for harm. I respectfully recommend that, if the cellar can not be kept water-free by cementing the floor and walls, its use be discontinued. An inconvenient, although otherwise unobjectionable, site can be found near the vegetable cellar. A year or more ago, when the spring near the hospital was first noticed, it was thought that its source was in the privy vault. This was thoroughly disinfected and closed, an earth closet being substituted therefor without affecting the flow. When the ditches are running full the leachings have other points of escape. They then bubble up under the little footbridge at the head of the branch that runs between the bench on which the post proper is located and the "interval" where the married enlisted men have put up their habitations. They appear also in an abandoned cellar 50 yards above the hospital, and probably at numerous undiscovered points in the channel of the branch, which closely follows the line where the bench breaks off. The lower three-fourths of this branch is slack water, except in floods. Last fall it became so offensive that it had to be flushed. Neither stagnancy nor surface drainage sufficiently accounts for its condition, leaving the inference that it is fouled through subterranean channels. It will require attention in June at the latest. The construction of a wing dam to divert part of the water of the larger branch at its head through it is respectfully suggested as a remedy. Sergeant Johnson's quarters are the nearest to this branch. The front door is 10 or 15 feet distant from the edge. He uses the water only for gardening. In this house a boy of 12 is now convalescing after being six weeks ill with continued fever. These quarters are the best of their kind, and are neatly kept, although they have been banked up with stable manure for warmth. The circumstances certainly do not justify a positive statement that this was a case of typhoid caused by foul water, but the facts may be properly presented without discussing their relations to each other.

At Fort Barrancas a marsh 600 by 200 yards, situated between the hospital and the water line, is regarded by the post surgeon as the cause of malarial diseases, which affect particularly the inmates of the hospital. His recommendation to tile-drain this piece of ground into a well in its lower part and pump the water by windmill into the main sewer was not approved, as the insalubrity of the marsh was not clearly

defined in the medical history of the post, and the practicability of draining it was doubted, liable as it is to tidal inflow. At Fort Ontario certain low grounds about 300 yards east of the hospital became converted in April into a pond 200 feet in area and 2 to 3 feet deep, in which the drainage of Schuyler street, from Fourth to Ninth streets, accumulated, and which became a depository for dead animals and other organic refuse. Provision had been made to prevent accumulation of water at this point by a culvert, but this had become obstructed. The attention of the local board of health was called to this unsanitary state of affairs and prompt remedial measures were instituted.

Sewerage.—As regards the disposal of excreta and liquid wastes our posts may be divided into classes somewhat as follows: A few still in the primitive sanitary condition of privy pit conservancy, with no provision for liquids but the absorbing soil of their sites; a few in which earth closets have been substituted for the pit; a few in which, with either the pit or closet, some effort is made to carry off liquid wastes; a few in which the drains for these liquid wastes form the rudiment of a sewerage system by having connected with them the outflows from certain lately introduced water-closets; and, lastly, the majority now provided with thoughtfully planned, carefully built, and thoroughly efficient systems of sewerage.

Privy pits continued in existence during the year at Forts Du Chesne, Keogh, Meade, and Sidney, Camp Pilot Butte, and Benicia Barracks. Reference is made above (page 106) to the pits at Fort Du Chesne. The medical director in his last report on the condition of Fort Keogh included a system of sewerage, with water-closets and baths, as one of the sanitary requirements of this post if its continuance is intended. Privy pits are still in use at the large and important post of Fort Meade. A recommendation to substitute the pail system for the pits at Fort Sidney was disapproved on account of the probable speedy abandonment of that station. The following from a report by Capt. George McCreary gives a view of the conditions of Fort Sidney:

> I have the honor to report that the sanitary condition of the post is good with the exception of the method of disposal of the night soil. For this purpose pits are used, and behind each set of barracks there are three or more rows of depressions in the soil marking ancient sites of privy vaults. When the vault becomes filled with fecal matter the building is moved over a new pit and the old one covered with earth. This custom has existed so long that the available space for the pits has become exhausted, and ground that has been appropriated for other purposes has been encroached upon. The houses at present in use are old and reeking with the emanations of countless pits. The best-directed efforts of the troops can only keep them surface-clean. The absence of any system of sewerage makes the water disposal of the night soil impossible, but the earth-closet system is available. I earnestly recommend that this system be at once inaugurated, and that the old houses be destroyed and replaced by brick houses with concrete floors. At the same time the old pits should be reopened and their contents removed. The excavations should then be thoroughly limed and filled with clean earth. This should be done at once, before the hot weather sets in.

The pits at Camp Pilot Butte, with a dry ravine for garbage, the parade ground covered with cinders, the surrounding country barren, and the only green spots in sight small patches of garden in front of the officers' quarters, carefully nursed on soil imported from a distance, suggest a survival in Wyoming of the conditions of some of the Arizona posts of twenty-five years ago, only that Pilot Butte enjoys a plentiful supply of water and ice, which those sun-dried desert stations did not possess. The privy pits at Benicia Barracks are associated with some more modern improvements. Kitchen and other waste waters are led from each building into two 4-inch mains which open

outside the reservation on lower ground, one on the surface, the other into a cesspool. These carry also the excreta from the officers' quarters. Estimates for sewers for this post have been considered on several occasions, but favorable action has been delayed on the ground, so it is understood, that it would be best to have one general system, especially as to outfall, for the arsenal and post, and that it would be well to wait for a decision as to the location of the gun foundry for the Pacific coast which, if in favor of Benicia, would cause some modification of the sewerage plan.

Dry-earth closets were substituted for privy pits during the year at Fort Buford and Boisé Barracks.

Besides those already mentioned the following posts are yet without systematic sewerage: Camp at Eagle Pass, Key West, Omaha, and Mount Vernon Barracks, and Forts Assiniboine, Bayard, Clark, Custer, Hancock, Marcy, McIntosh, McKinney, Missoula, Pembina, Ringgold, Sherman, Sill, Stanton, Sully, Walla Walla, Washakie, and Yates. At a number of these some provision is made, as at Fort Sully, to carry off bath and barrack room waste water through covered drains into cesspools or ravines. At others, as at Fort Yates, the waste water runs into the subsoil or collects in frozen pools on the surface. At Omaha Barracks drains from officers' quarters open on the surface of the parade ground 40 to 60 paces in front of the quarters. Remedial measures for this condition were suggested, but no action was taken on the recommendation, in view of the speedy abandonment of the barracks as a military station. At Fort Bayard waste water is removed from the officers' quarters and the hospital by a 6-inch tile sewer, with 4-inch connections, all at right angles, with running traps. The rain leaders were originally connected with this drain, and were arranged as ventilators for it, but a prevalence of throat troubles in 1891 led to their disconnection. Waste water from the barracks is piped about 30 feet into an open ditch, which receives the output of the 6-inch drain and spreads the whole upon the post garden.

The dry-earth system is used at most of these posts for the disposal of excreta. This method, which answers excellently for small civil communities, is open to several objections as carried out in practice at our military posts. For its efficient accomplishment there should be stored for use a sufficiency of dry pulverized earth, which should be properly distributed over the excreta; the troughs should not be permitted to become so full as to be unwieldy, and each post should be provided with two sets, one to undergo cleaning and deodorizing while the other is in use. If the troughs were mounted on low trucks much of the heavy handling would be avoided. The practical objections to the system are to be found in the want of dry earth, its negligent use, and the labor of handling the troughs. At some posts, as at Walla Walla, where the work of scavengering is done by civilians under contract, the system answers well. The following by Capt. James E. Pilcher, shows the methods in use at Fort Ringgold.

The sewerage system.—The term "sewerage system," for the purpose of this report, is assumed to include all appliances for the removal of solid and liquid waste from the post. The rainfall is so small that the rain is quickly absorbed to a large degree. What is not taken up by the soil and its products is carried off all too quickly by natural surface drainage. In considering the question of sewerage in this locality, then, the disposal of adventitious superficial fluid waste is a silent factor not to be considered. But few of the roofs are provided with gutters, and there are, consequently, but few rain leaders; these empty upon the surface.

There remain, then, for disposal the solid waste—excrement and solid refuse—and the liquid waste from the urinals, kitchens, bath rooms, and laundries. The burial system is in use for the former, and a system of water carriage for the latter.

The earth closet method is employed for the disposal of night soil. Each set of quarters is provided with one or two earth closets; the hospital has two, and the large sink for enlisted men contains twelve. Under each seat stands a galvanized iron pan 18 by 24 by 16 inches, into which the dejections fall. Boxes of dry earth, with scoops, are provided in the closets and the excrement is kept covered and practically inodorous. No urine separator is employed, sufficient earth being used to take up the fluid. Observing that the urinary excretion of the men was thrown forward against the front of the seat instead of into the pan, the post surgeon in February, 1893, secured the introduction under each aperture of tin urinary deflectors to turn the urine back into the pans. The pans are washed, deodorized, and disinfected at frequent intervals as required. A civilian scavenger removes their contents nightly and carts them to a pit about a mile from the post, where he dumps them. When one pit is filled a new one is prepared.

Solid refuse from the kitchen is removed with the ashes by the labor of prisoners to a point near the dump for night soil.

Stable refuse is carried to a convenient point half a mile from the post. The piles of manure are allowed to dry here until they are readily inflammable, when they are ignited and reduced to ashes.

Liquid refuse is carried off by a system of pipes opening into the Rio Grande River at a point just above low-water mark, and 200 yards below the post. The sewers thus formed are composed of cylindrical salt-glazed vitrified earthenware tiles, with socket and spigot ends. All connections are made by angular junctions to facilitate the passage of the sewage. The joints are tightly calked with oakum and sealed with Portland cement.

The system consists of a main sewer composed of 6-inch tiles, and two principal and several minor branches composed of 4-inch tiles. The longer branch begins at the hospital and passes in front of the barracks which front on the parade ground, receiving branches from the other barracks and from the enlisted men's sink, and ends at a manhole in the rear of the guardhouse, where it is joined by a branch from the married soldiers' quarters. The second principal branch begins at a urinal in the rear of the quartermaster's storehouse, whence it goes to join the pipe running in the rear of the officers' quarters and emptying into the main sewer at a manhole situated on a line with the rear of the officers' quarters. A third branch begins at the quarters of the quartermaster-sergeant, and runs thence parallel with the preceding branch, connecting with the other non commissioned officers' quarters and the commissary storehouse. These branches contain 6,197 feet of 4-inch pipe.

The main sewer runs at an angle of 20° to the officers' quarters, from the manhole in the rear of the guardhouse to a manhole near the rear of the hay corral, whence it passes into the river in a direct line. The main sewer consists of 1,594 feet of 6-inch pipe.

The fall of the sewer is 6 inches to each 50 feet.

There are five manholes in the system, each 3 by 4 feet, and of a depth ranging according to the depth of the sewer at that point. They are located (1) at a point halfway between the hospital and the barracks, (2) at the southeast end of the barracks; (3) in the rear of the guardhouse; (4) 50 yards beyond the southeast end of the officers' line, and (5) near the eastern corner of the hay corral. They are simply rectangular pits with brick walls faced with Portland cement, with which they are also floored. The sewer pipes open into them at the level of the floor. They are covered with heavy iron gratings, which permit them to act as ventilators, excepting the second one, which is covered with a plank platform.

The entire system of pipes is flushed weekly by plugging the ingress pipes in each manhole in succession, and playing into the manhole with a 2-inch hose. The flushing thus obtained is very inefficient and the post surgeon has recommended the introduction into each manhole of a tumbler-flushing tank with automatic action. The arrangement is simple and inexpensive. The tank is so balanced that, when filled, it will automatically empty itself into the sewer, returning to its original position to be filled again. By varying the amount of the flow from the water pipe, the time required for filling the tank can be regulated to occur at any interval desired, each discharge throwing thirty gallons of water into the manhole, completely filling and scouring out the pipe emerging from it.

At the hospital, besides the kitchen sinks and the bathrooms, one urinal empties into the sewer. At each set of barracks it receives the waste from the kitchen sinks and bathrooms. At the soldiers' water-closet it receives the contents of six urinals. At the guardhouse it receives the waste from the bathroom, and later, the guardhouse urinal. Each set of officers' quarters discharges into the sewer three pipes, one from the bathroom, one from the kitchen sink, and one from a urinal in the extreme rear. At the noncommissioned staff officers' quarters the sewer receives the waste from the kitchen sinks and bathrooms.

The urinals in the closets of the officers, enlisted men, and the hospital are the Demarest patent, porcelain flat back, lipped urinals with non automatic flushers.

In a few places there remain the old Mott flat back, lipped, enameled iron urinals. All connections with the sewer are made by means of 1½-inch pipes intercepted by simple S traps. There are no grease traps.

The waste of the engine house is discharged, not into the general sewerage system, but through its own pipes into the river.

The cost of the material and labor required for the construction of the system of fluid sewerage was approximately $3,275.

By the combined methods described all the waste products of the post are promptly, inoffensively, and hygienically removed. The system works smoothly and satisfactorily, and may be said to be an unquestionable success.

The subject of sewerage at Forts Clark and Washakie is under consideration. A contour map of the former post has been made by the engineer officer of the department, and the Quartermaster's Department is engaged in planning a system of sewers. Meanwhile the open drains are kept in good condition by flushing and the occasional use of sulphate of iron. At Fort Washakie an adequate provision for the disposal of sewage has been urged with more or less earnestness for many years. At the present time this is regarded as the greatest sanitary need of the garrison. The Major-General Commanding is of the opinion that the troops can not be withdrawn from this place for many years to come, and that the post should be put into condition for indefinite occupation. It is hoped, therefore, that favorable action will be taken in this case. In March the post surgeon of Fort McIntosh urged the introduction of a system of sewerage to be disposed of by intermittent filtration to purify it in part before turning it into the river. In the future, when Laredo has a sewerage system, it would be well to sewer this post connecting with the city outfall, but it is unlikely that the sewage could be run into the river now above the intake of the city's water supply. Estimates are understood to have been forwarded by the post quartermaster. Capt. B. D. Taylor has made several efforts to have favorable consideration given to the need for sewerage at Fort Sill. This post is built in the form of a hollow square on a square plateau 50 to 80 feet high, with Medicine Bluff Creek at its base on the north. The officers' quarters on this side and two sets on the east have a sewer which enters the creek below the post. The other buildings on the east, those on the south, and the barracks and hospital on the west, have sewers which run into a main at the southwest angle, having its outfall in a cesspool in a swampy hollow. The main in the last 200 yards of its course is an open drain. There are besides from certain houses four other drains which issue on the surface. All this system is for waste water; but the 4-inch drain tiles are too small; they are badly cemented and have no traps nor manholes. Moreover, the fall is insufficient, only 4 inches in 100 feet. As a result of attempts to flush the water backs out into some one's yard or the pipes burst and there is a constant necessity for digging up and repairing. Capt. Taylor's recommendation for a new sewer system was approved last year by the Surgeon-General. On inquiry at the present time it is found that the subject is under consideration in the office of the Quartermaster-General awaiting a decision of certain points which will settle the question of improvements as between Fort Sill and Fort Reno.

Attention was called to defects or insufficiency of the sewerage system by the medical officers of a few posts. Among the faults noted by Maj. T. E. Wilcox in the new system at Fort Huachuca were imperfect cementing of joints, sections not strictly on grade, and small pipe inserted between joints of larger size. Extensive repairs were made to this system, the grades corrected, and new pipes laid. As the reports

from Fort Wingate characterized the sewers as defective, a letter was sent to the post surgeon calling for a report in full on the subject, with specific recommendations for improvement where such in his opinion were called for. Meanwhile it appears that instructions had been sent from the office of the Quartermaster-General to have plans and estimates prepared, giving careful consideration to the latest information relating to the condition of the sewerage system. These were forwarded, and having been approved the funds necessary to effect the improvements were allotted. At Angel Island a line of earthenware sewer pipe runs along each side of the parade ground and, uniting at the foot of the slope, is continued by an iron pipe into the bay below low-water mark. These carry off rain and all wastes, including discharges from the water-closets of the post. Ventilation is by the rain leaders, which are untrapped at their junction with the sewers. The men's privy is a deep vault or cesspool, which can not be kept free from odor by flushing. The department commander directed the commanding officer of the post to present an estimate for what would be necessary to remedy the defects of the system. The following is from the report of Capt. W. R. Hall from this post:

The drainage during the rainy season is somewhat defective. There are some open cement drains, but not nearly enough, and more attention should be paid to running off the water from numerous springs situated near the stable and between the hospital and officers' quarters. A ditch should be constructed to drain the two upper sets of barracks. The sewerage system, a most faulty one, may be described as follows: There is a double line of earthenware pipes, one beginning back of the bakehouse and the other in the neighborhood of the stable, both of these points being toward the summit of the ascent upon which the post is situated. The sewers, one running on each side of the parade ground, unite at the foot of the hill to empty, by means of an iron pipe, into the bay below low-water line. They carry off all sewage from water-closets and kitchen sinks, also waste water of every description, including the rain water from the roofs. The only ventilation of these sewer pipes, as far as I have been able to discover, is through the rain-water pipes, which empty directly into the main sewer without any trapping, and of course any accumulation of gases escapes from the open ends of these pipes, or, in other words, the sewers are directly ventilated onto the roofs of the dwellings. Undesirable as this may seem it has in reality proved a safeguard, for without these outlets any unusual pressure in the sewers would force gas through the badly trapped or untrapped house drains into the various buildings. In this connection attention is invited to the men's privy. This is practically a large cesspool. There is a deep vault into which sewerage pipes empty, and out of which runs a drainpipe into the main sewer. Into this vault, more or less filled with water, are discharged the excrement and urine of nearly 300 soldiers. The air in the building is always contaminated by the foul gases emanating from this unventilated cesspool, and at times the odor of it is perceptible from the road. Attempts are made to clean this vault by flushing it with water several times a day. The accuracy of the foregoing statements may seem incompatible with the acknowledged good health of the command, but this apparent inconsistency is readily explained by the superb climate of Angel Island, which encourages a life out of doors and tends to keep open both doors and windows, so that the fresh air blows freely through the dwellings.

A new sewerage system was provided for Fort Barrancas during the year. The details of the system are thus reported by Lieut. R. S. Woodson, assistant surgeon on duty at that post:

The sewer system is composed of 6 and 8 inch cylindrical vitrified glazed earthenware pipes, with hub and spigot joints closed with mortar cement. The pipes are laid, hubs up, in straight trenches 3 feet deep in true alignment. All changes in direction are effected by means of large manholes built of brick, with tight-fitting ventilated iron covers. Three manholes are placed near the three single hydrant nozzles mentioned above for flushing purposes, one in rear of hospital, one in rear of noncommissioned staff quarters, and one in rear of officers' quarters No. 13. The flushing is accomplished by means of a 4-inch rubber hose connected with the fire hydrants. Besides these three are numerous manholes placed at suitable intervals for purposes of inspection. The lines are so run as to produce the greatest possible fall. The three 6-inch sewer mains converge to a common manhole (6 feet deep) situated

at the lowest level obtainable on the plateau upon which the post is built. The gradient of these mains is about 1–100. From this point commences the 8-inch main, which for the first 100 yards has a gradient of 1–20, and from there on to the outlet below the water line, a distance of 1,300 feet, it has a gradient of only 1–200. This deficiency in grade is overcome by the excellent arrangements for flushing and the carefulness with which the pipes were laid. The outlet of the main from the last manhole is composed of 8-inch iron pipe, and extends out into the water, supported upon iron cylindrical piles a distance of 30 feet.

The plumbing and fixtures in officers' quarters No. 7 to 17, inclusive, are as follows: Each bathroom contains water-closet, wash basin, and bath tub. These rooms are built as an addition to the main building with three exceptions, and are consequently well lighted and ventilated and to some extent isolated. The water-closet is a washout hopper, constructed of stoneware, with a basin so shaped that a small quantity of water remains in it to receive the excreta, which are flushed out over the edge of the basin into a siphon trap below by means of a strong, straight current as well as a rim flush. The closet is provided with a siphon action, water-waste-preventing cistern, which discharges several gallons of water into the hopper by means of a 1-inch lead service pipe. The siphon trap empties into a 4-inch soil pipe of drawn lead, flanged over the floor entrance. The siphon trap is ventilated from its sewer end by connection into the 2-inch ventilating pipe. The lead soil pipe (3 feet long) is soldered to a small section of iron pipe, which in turn empties into the 4-inch iron soil pipe by means of a Y joint calked with hemp and lead. This 4-inch iron pipe continues down and connects with a 6-inch house drain of vitrified glazed pipe without a disconnecting trap and fresh-air inlet. The 4-inch pipe continues the same size through the roof and above to the height of 4 feet. On the way up it receives the 2-inch ventilation pipe by means of a Y joint. The bath tubs are of wood lined with tin; they are supplied with hot and cold water by ½-inch lead supply pipes. The waste pipe is 1¼-inch lead, with a siphon trap ventilated by a connection with the ventilation pipe and with a screw-cap opening for cleaning. An overflow pipe empties into the waste pipe below the trap. The wash basins are plumbed in a similar manner. The old dry-earth closets in rear of the officers' quarters have been converted into servants' closets. They are supplied with a straight back short hopper with rim flush and siphon traps. The hopper is flushed by a water waste-preventing siphon-acting cistern. The plumbing of this closet is similar to that of the officers' closets, except that the siphon traps are not ventilated, nor is this necessary, for the closet is isolated from the main building.

The kitchens of the officers' quarters are each furnished with a sink of galvanized iron and supplied with hot and cold water by ½-inch lead supply pipes. The waste pipe, 1¼-inch lead, of this sink contains a siphon trap with a screw-cap opening beneath for cleansing; it empties into a 2-inch cast-iron soil pipe by means of a Y joint, which in turn empties into the 6-inch house drain by means of a T joint. This 2-inch soil pipe continues up 3 feet above the roof. The hot water is obtained by running the water through a range and then into a boiler, from which it is supplied to the house by ½-inch lead service pipe. A drip cock is placed at the lowest level under each house to let the water out of the lead pipes after it has been turned off to prevent freezing.

The kitchen sinks, bath tubs and wash basins of the barracks are plumbed in exactly the same manner as those in the officers' quarters. There are two sinks in each kitchen, six wash basins in each of the three bathrooms, and three bath tubs in each of two bathrooms. Each fixture has its own siphon trap, which is ventilated, and an overflow pipe. They are supplied with hot and cold water. The lavatories are composed of colored marble with stoneware basins. The bath tubs are of iron.

The guardhouse has a bathroom with bath tub, wash basin, and washout hopper closet. It is plumbed in a similar manner to that described in connection with the officers' quarters.

The old dry-earth closet has been moved forward to a position just in rear of the barrack kitchens. It has been enlarged to such a capacity as to contain twenty partitioned closets, each supplied with a short hopper. It has eight slate stalled urinals. The bowls of the hoppers are in separated pieces from the siphon trap, to which they are connected by a flange joint; the bowl is cone-shaped. The water seal does not rise to any extent in the bowl. It is supplied with a rim flush connected by a 1¼-inch lead pipe with a waste-preventing siphon-acting cistern above operated by a cord attached to a lever. Each hopper is covered by a rough plank with a hole cut in it to fit over the bowl.

The urinals are of stoneware set in slate stalls and floors, eight in number; they are flushed by means of four automatic flush tanks of the same size as the cisterns over the hoppers. The cisterns and tanks are supplied by a ¾-inch iron gas pipe connected with the water main and giving off lead branch pipes to each cistern.

Underneath the floor on each side of the building runs a 4-inch cast-iron soil pipe into which empties the 4-inch drawn-lead soil pipe of the hoppers by means of a wiped and gasket joint; also the soil pipe from the urinals.

At each corner of the building is placed an upright 4-inch cast-iron soil pipe running up through the roof. These are connected with the two horizontal soil pipes under the floor. The two horizontal pipes are connected across the building, and from the point of intersection a 4-inch cast-iron pipe leads off to the 6-inch sewer in front. The urinals are emptied by 1¼-inch lead pipe into a common soil pipe 4-inch cast iron situated behind the fourth and fifth stall, each four being supplied with a ventilating siphon trap on either side of the upright soil pipe. Each water-closet trap is ventilated into a 2-inch cast-iron ventilating pipe, running around the walls of the building just above the hoppers, connection being made with T joints.

The noncommissioned officers' quarters have their bathrooms built on the rear porch. They are furnished with a straight back, short hopper, with rim flush, similar to servants' closets. They are not supplied with hot water; with these exceptions the plumbing is exactly similar to that of the officers' quarters.

The hospital and steward's quarters have not been plumbed, in view of the fact that a new hospital is expected to be built later on.

The whole system above ground was carefully tested by the post surgeon with oil of peppermint and hot water, and all joints were found air-tight.

The water from the pipes is loaded with iron rust, which becomes thickly deposited on all basins, bath tubs, hoppers and urinals. This would indicate a careless coating of coal-tar composition. The water has an odor of tar, and is slightly contaminated with grease from the packing. This, it is thought, will disappear in course of time. There seems to be a multiplication of pipes and fixtures beneath the barrack lavatories, but if an error it is on the side of safety.

All plumbing has been done in a scientific and workmanlike manner by competent plumbers from Cincinnati, Ohio.

The carpenter work, done by a local workman, is bad. Large, irregular holes have been left in the floors and ceilings of houses; the bath tubs have been boxed in with pieces of dry-goods boxes, etc.

The men's closet is the only bad pattern of the whole work, the hoppers (twenty in number) being cone-shaped with a rim flush, the water seal extending no further than the apex of the cone; it has, though short, all the fault of the old-fashioned long hopper. Excreta deposited on the sides are not swept away by the weak rim flush. When it is remembered that 180 men have to use this closet it will easily be seen that without due care it will develop into a nuisance. It has been inspected four times, and each time all the hoppers were found in a filthy condition, not due to carelessness in flushing. A long trough closet, with separate compartments and an automatic flush tank, would have been much more suitable. With this exception the work is considered excellent in every detail, and will greatly increase the healthfulness of the post.

Improvements to the sewerage system were planned at Fort Grant and Madison Barracks. According to the medical officer on duty at the former post changes are now in progress which, when completed in accordance with the plans, will be serviceable and effective. At the latter station a new sewer was laid in rear of the officers' quarters; bath tubs and water-closets properly trapped and vented were put into the houses, and means provided for flushing thoroughly the water-closets and urinals of the barracks. During the year the sewers of Fort Niagara were extended to an outfall below the source of the water supply. A new sewerage system at Fort Niobrara was completed in November, but a lack of water available to flush it prevented any benefit from its use. The springs are amply sufficient and the pumps fully adequate for the work, but the storage tanks and mains are too small, the latter consisting of 1½ and 3-inch pipes indiscriminately continuous. These defects of the water system are under consideration by the Quartermaster's Department.

Faulty plumbing was reported from Jefferson Barracks and Alcatraz. In some of the buildings at the recruiting depot, particularly the mess hall, there are defects in plan, materials, construction and repair. The ventilation of this system is into the kitchen, and the rain leaders open directly into the sewers. An allotment was made by the Quartermaster-General to remedy these defects. Clogging, leaks, siphonage, and want of traps and vents are noted in the report of the inspection

of the sewerage of Alcatraz Island by Lieut. Ogden Rafferty, assistant surgeon, U. S. Army:

The island has three sewers. All are of the combined system taking in a portion of the drainage; in the ditch at the northeastern end of the "citadel" are two flushing barrels placed over the ends of two 8-inch pipes; these pipes run down the center of the ditch below ground. One passes under the eastern tower, then down the center of the ditch to near the south corner of the ditch, and then passes out to a Y-shaped branch of the brick sewer which runs nearly south to the sea. The pipe from the other barrel, after running around the northwestern face of the building, passes under the west tower and crosses the ditch three times on itself at right angles, and joins the head of the brick sewer at the southwestern end of the building (near the drawbridge to the old main hallway). This sewer, of oval shape, about 3 feet by 2 feet, runs along the southwestern wall of the ditch and beyond, till it is joined by the branch from the other pipe; then it runs rapidly down the hill in a southern direction under the road, out on the other side, and again disappears under the road at the corner of the ordnance storehouse. Here it disappears, running under the earthworks and coming out at the water's edge, some 60 yards beyond, where, at the edge of the rock, it drops 60 feet in a mason-work column to the water's edge.

The hospital steward's quarters and the noncommissioned staff quarters and bakery are connected with a combined sewer that begins at a water-closet a few feet from the bakery, runs 15 yards northeast to the road bank, drops down 6 feet, and crosses the road to the corner of the noncommissioned staff row, then runs directly back of this line in a direction northwest for its entire length, curves around the far corner, crosses the road, and, before emerging through the stone wall to dip under the hospital, is joined by a surface drain (that drains the front and rear of the noncommissioned staff row of quarters); increasing in size at this point from a 4-inch stone to a 6-inch stone pipe, it continues in a northeasterly direction under the hospital. The 4-inch stone pipe from the hospital steward's quarters, after passing diagonally under the whole length of the hospital, and receiving the various branch pipes from it, connects with the sewer in a mason-work box, from the lower end of which emerges a 6-inch stone pipe that runs 50 feet down the steep hill and empties into an open mason's trap; this trap also receives the drainage of the hill and slope near the prison, and the recently laid 2-inch iron soil pipe from the blacksmith shop and plumbers' quarters; from this point a brick sewer has been built diagonally across the road and underneath the prison dining room, emptying into the bay, 15 feet above the water, through a drilled hole in the rock.

At the adjutant's office begins a sewer which also receives the roof water of the building as it passes; it runs back of and near the foundation walls of the officers' row of quarters to the northwest corner of the commanding officer's quarters; at this point it is joined by an elbow with the drain pipe from the third set of quarters on that line; from this point it drops nearly vertically for 32 feet to the roadway beneath, passes beneath this and continues under ground till it emerges on the water's brink at a point near high-water mark. At the point where the sewer begins its vertical descent, a small break recently occurred at its junction with the drain from the third set of quarters. This was due to a small landslide, caused by the rains; at the present time it is undergoing repairs. This sewer, with all its connections in the houses contributing, is of modern structure and has given satisfaction, with the exception of the water-closet beneath the adjutant's office, which has a ventilating pipe stopping at the ground level, and the exception mentioned in describing the buildings.

The light-house sewer or drain begins, without a ventilating pipe, at a closet in the yard, receives the water from the kitchen sink, which, by the way, passes through the top of the cistern connected with the light-house, joins the above-mentioned drain, and curves down and around the hill in a southern direction and joins the large sewer from the "citadel" near the ordnance storehouse, by a connection in the top, so that the sewerage drops vertically into the large sewer.

The "citadel" connections with the sewer are in the main good, but are faulty in arrangement; the fixtures are all of modern design, with the exception of the pan-closet in the ditch at the rear of the middle set of quarters; in all the bathrooms the bath tubs and stationary basins join directly with their small-caliber lead pipes to the larger iron water-closet soil pipe. Frequently when these bowls are freely flushed, they siphon off the seal from the stationary washbowl and washtub, leaving by this means an outlet for sewer air into the bathrooms. Recommendation has been made and concurred in by the commanding officer, to have these stationary bowls and bath tubs disconnected from their direct connection with the sewer and to connect with it through means of the open hoppers that have already been placed outside each set of quarters, and which at present are only used, with one exception, to carry off the water from the kitchen sinks. The soil pipes, with the exception of those

for the bathrooms, built over the ditch, all end at the level of the upper windows, making it possible for sewer air to drift into the second-story windows when the upper sash is lowered. These should be carried above the roof, as recommended in July, 1892.

The sewer starting at the bakery has a pan closet at its beginning which does not maintain its seal. At the point where the sewer bends over the rock to reach the rear of the noncommissioned staff row, its construction is very bad; it frequently clogs and cracks at the joints, leaking down the side of the rock and emitting foul odors. At the noncommissioned staff row the closets are of the long, straight, hopper style, and are placed in small houses on the porches between and at the ends of the buildings. Some of these closets are used as storerooms. The kitchen pipes empty straight into the sewer by small pipes, as do also the pipes from the bath tubs; some of these fixtures are occasionally syphoned. In September, 1892, the "peppermint test" was applied to this row of quarters; every fixture was placed in its most favorable condition. It was then found that every fixture in the central house was defective, and that the ventilating pipes were carried but a short distance from the ground instead of above the roof in all the houses. This section of the sewer for the past seven months has frequently clogged, and the sewer water coming to the surface has followed the surface drain around the end of the row, occasionally overflowing and soaking through the roadway, to come out through the stone wall at the ground floor of the hospital, which is 15 feet below the level of the roadbed. Recommendation for taking up of this section of the sewer and overhauling every one of its connections has been made and approved of, but as yet no money has been made available for its accomplishment. The stone pipe drain from the hospital steward's quarters, after passing diagonally under the full length of the hospital, and receiving each of its connections, empties into the mason's box under the floor of the new portion of the hospital. This is not a desirable arrangement, but could hardly be averted without considerable expense. From the free ventilation beneath the building, which is high enough to admit of inspection, no evil results have been made apparent.

The water-closet at the men's barracks is a house situated at the edge of the wall near the kitchen and above the commissary building. It contains two urinals and a trough of automatic flushing design, over which are accommodating holes for six. The 6-inch soil pipe, within a yard of its origin, turns twice at right angles to get over the wall. It then turns down the wall and runs by a steep decline to the wharf, beneath which it empties. This pipe has been frequently clogged, and at the present time has been closed for two months. A recommendation was made to move this building back over the wall far enough to admit of the pipe running directly to the wharf without any sharp bends. This was not, however, concurred in by the commanding officer, and a scheme is now under consideration to erect a privy over the water to take the place of the old one of similar type under the carpenter's shop, which is now all the men have.

Sewage at a few posts, as Forts Bayard, Bidwell, Stanton, and Logan, is utilized for purposes of irrigation. The system at Fort Stanton, which carries off waste water only, consists of earthenware pipes. The main, 12 inches in diameter, discharges into two settling tanks 9 feet in diameter and 10 feet deep, 600 yards below the post. From these the liquid is siphoned off and in part used to irrigate the company gardens. The pipes are unevenly laid, and hence liable to choking and foul odors. Rectangular instead of Y branches are used, and flushing is imperfect, from defective arrangements and want of water.

The surface drainage at this post is very good and is accomplished by narrow ditches (acequias) of a depth from 1 to 2 feet, through which, at all seasons of the year when possible (winter and the dry season excepted), water from the Rio Bonito is conducted. The fall being considerable, 1 foot to 100 yards, no stagnation occurs.

The sewerage system as at present constructed is incomplete, faulty and insufficient. It is of the "water carriage" variety, and aims to remove only the liquid sewage and waste water from kitchens, bathrooms, and laundries. The pipes, which are round, are of vitrified earthenware, with cemented joints, and are in size from 3 to 12 inches in diameter. The main sewer, of 12-inch pipe, begins at a point about 50 yards beyond the hospital, and is continued parallel with the front of that building for 500 feet. It then makes a half turn to the left, crossing the parade ground diagonally. From the northeast corner of the parade ground it is carried, with several changes of direction, to a point 600 yards below, where the sewage is emptied into two settling tanks, each 8¾ feet in diameter and about 10 feet deep. By means of

automatic siphons these are constantly emptied of their fluids, which are allowed to flow over a considerable area of porous soil and in part irrigate a company garden. The solids are removed once in 12 months, or oftener if necessary.

The main sewer in its passage through the post receives the flow from the larger drains, into which in turn the waste pipes empty. The sewers are flushed in two ways: (1) The main sewer at its origin above the hospital has an open mouth, into which the water from an acequia is daily turned at seasons when the acequia contains water; (2) three flush tanks have recently been placed at various points on the medium-sized sewers. These are supposed to be automatic and to flush intermittently, but they are worthless unless worked by hand. At present they are untrapped and emit foul odors. As is evident, both these methods fail in the dry season for lack of water, and, as a result, sewer gases are freely generated, which, escaping, pollute the atmosphere and constitute a menace to health.

When the system was first inaugurated ventilators were placed at intervals along the larger sewers, but probably owing to insufficient flushing they speedily became such a nuisance as to render their closure necessary. At the present time there are no ventilators along the main sewers. The kitchen waste pipes, as they leave the buildings, are ventilated by grease traps (very recently placed) having a 4-inch iron pipe run several feet above the roof. Into these traps empty also, whenever practicable, the waste pipes from bathrooms.

The fall is ample, being over 3 feet in 100 yards on the parade. The defects of the system are several: The sewers and drains are too small for the amount of liquid they are at times required to convey. Many of the smaller pipes turn at a right angle or are entered by T-branches instead of Y-branches or curves. The pipes, instead of having an even and steady fall, are laid according to the uneven conformation of the ground, thus facilitating breaking of joints and permitting settling of solids, which results in choking of pipes and excessive generation of gases. These gases at times break the seals of drain traps and enter the houses. There is no provision for the removal of solid sewage, notably human excreta.

A difficulty with which we have to contend is the formation of an extremely hard cement resulting from the mixture of grease in the sewage and the hard water. This thickly coats the interior of the pipes, sometimes nearly occluding them.

Human excreta are disposed of by the dry-earth system. Wooden draw boxes are placed beneath the privy seats and their contents are removed every morning by the scavenger, a civilian in the employ of the Quartermaster's Department. While the system is perhaps the best possible in the absence of water carriage, it, of course, offers many objections which could not be urged against the latter. The draw boxes are unlined, permitting saturation of the boards and ground beneath with urine.

Garbage is placed in covered zinc barrels and is removed each morning by the scavenger.

Contents of privy draw boxes, garbage, and ashes are deposited a half mile or more below the post in the direction opposite to that from which the prevailing winds come.

As reported last year, the disposal of the sewage of Fort Logan, by irrigation on a neighboring ranch, has so far given satisfaction to all concerned; but the ranch, in the progress of improvements, is open for sale for building purposes, and some other method of sewage disposal must soon be considered. The difficulties that may hereafter attend the disposal of sewage at this post show the necessity for a thorough consideration of this point in the selection of sites for military posts. The present method at Fort Logan is liable to be abruptly terminated by causes beyond the control of the military power, and it is safe to say that the 50,000 or 60,000 gallons of liquid waste daily thrown out from this post will not be permitted to flow into either of the streams in the vicinity.

Early in the year the post surgeon at Fort Schuyler invited attention to the open frame structure projecting over tide water and used as a water-closet by the men, characterizing it as a disgrace to any garrison in the Army. As a result of this the Quartermaster's Department approved a contract for a suitable building and fixtures for water-closets, wash rooms and bathrooms between the beach and barracks, and for a sewer from the noncommissioned officers' quarters to the beach. Similar recommendations were made by the medical officers stationed at Fort McHenry, and with similarly favorable results as regards the construction of water-closets and better bathing facilities for the men.

Several years ago the necessity for a sewerage system for the important post of Fort Monroe and the rapidly growing civil community at Old Point Comfort, Va., was strongly urged. A plan submitted by Col. Haines, U. S. Engineers, of pumping the sewage into the outgoing tide was approved by the Surgeon-General as likely to prove true economy in the end, notwithstanding its first cost. As a result of the efforts of that time the sum of $25,000 was appropriated by Congress March 2, 1890. In his subsequent reports the post surgeon continued to refer to the insanitary condition of the post and its surroundings, and in May, 1891, he cited, as special nuisances, the methods of sewage disposal at the hotels on the Point, the Hygeia throwing out the excreta of 1,000 persons on the beach above low-water mark, and the hotel near the main gate of the post accummulating the excreta of 100 people in a foul cesspool. From the papers on file it appears that the work of the Engineer Department, under the appropriation for sewerage, was delayed with a view to make an efficient system for the whole of the Point by getting the civilian community to construct their sewers in accordance with the Governmental plans. Col. Waring, of Rhode Island, devised a system on behalf of the property owners to be used by them conjointly with the Government. This plan was considered unobjectionable in its general features by the Secretary of War, but before giving it his approval certain alterations of detail were insisted upon, as, for instance, that the capacity of the reservoir be increased from 130,000 to 180,000 gallons; that provision should be made for maintenance; that the property owners should keep on hand an efficient outfit of machinery, in duplicate, and that the outlet of the force main should extend into the bay not less than 600 feet beyond low-water mark, etc. However, no progress was made, and in May, 1892, in view of the danger of cholera from Europe, the post surgeon called attention to the insanitary conditions of the post and its surroundings, urging that the hotels be required to begin their sewerage system, and that work on the Governmental system be no longer delayed. Col. Frank, the post commander, recommended that the hotels be required to construct their system within a limited time or close their houses. The Surgeon-General forwarded this paper to the Secretary of War, inviting his attention to what he characterized as the gravest sanitary error of the day. "The Medical Department," he said "has unceasingly endeavored to have it rectified, but so far without success. Great as is the necessity for this work in the fort it is as nothing compared with that for the hotels, whose population, drawn from all parts of the country, the bearers of all varieties of disease germs, and under no sanitary control, is an ever-present menace to its own health as well as to that of the garrison that is compelled to be its neighbor. The lodgment of disease germs under conditions so favorable to their cultivation will result in disaster from which there can be no relief, and I join in earnest concurrence with the recommendations of the post surgeon and post commander that the hotel people be compelled to construct the needed sewerage at once or that their houses be closed." In June, it appears from the reports, that the proprietor of the Hygeia Hotel took steps to extend the sewer pipes of his establishment, concerning which Col. Frank reported:

> This will, however, only mitigate to a limited extent the evil complained of, as the sewage will continue to be thrown on the beach. What is needed is a complete system which will meet the wants of all the hotels and will correct other and equally serious faults.

On July 30 the Surgeon-General again urged that the hotels be closed unless the parties interested commenced their sewerage system and

had it completed within a specified time. Again, on September 5 he addressed the Secretary of War on the subject, asking that the evils be remedied at once. The files of the Surgeon-General's office show that the last-mentioned communication was referred by the Secretary to the Chief of Engineers with the remarks—

It is understood that the Chief of Engineers has abandoned the idea of having a common system for the Government and private parties, and has determined that there should be one system for the Government and another for private parties. If such is the plan to be carried out it would seem that there ought to be no delay in carrying it out and in constructing and putting in operation the Government system at least to the full extent of the appropriation.

The Chief of Engineers explained that work had not been commenced as the act appropriating $25,000 stipulated for a complete system, which could not be constructed for less than $45,000. At the close of the fiscal year the status is understood to be that an estimate will be submitted by the Chief of Engineers for funds necessary for the construction of a sewerage system for all the buildings at the post.

Meanwhile, as shown by the following extract from the sanitary report for the last month of the fiscal year, the conditions continue to call for immediate remedial measures:

The buildings and grounds of the post have been kept as clean as possible during the month. Some heavy falls of rain, aided by high tides and easterly winds, backing up the sea water outside and retarding the flow from the drains, have flooded the parade ground and kept it flooded for several days at a time. These shallow ponds of water evaporating slowly cause foul smells from decaying vegetation, and would be sure, if this condition of things was repeated during the summer, to bring on much malarial disease. The level surface of the parade and its slight elevation of only a few feet above the water outside makes it very difficult to drain it properly, but something should be done either by cleaning out the present drains or cutting some open ones for temporary use, or by any means that would be found advisable to have this flood water carried off more promptly.

The sewerage of the fort and of the buildings outside on the reservation remains in the same defective and dangerous sanitary condition as stated in the sanitary report for April and former months.

The addition of grease tráps to kitchen sinks or house drains was recommended by two or three medical officers during the year. These traps, when suitably arranged and carefully attended to, are theoretically of use in connection with the waste-water pipes of large messes, particularly where there is an insufficient fall. Practically they are so liable to become a nuisance when the necessary care is intermitted that it is questionable whether their use in any case can be recommended. They are certainly needless in the kitchens of officers' quarters, as care on the part of the cook and an occasional flushing with lye will keep the pipes clean. The following is from the report for June last of the post surgeon, Fort Thomas, Ky:

In view of the remarks of the post quartermaster in an indorsement dated May 12, 1893, and the opinions stated in a letter dated Surgeon-General's Office, Washington, May 26, 1893, and my personal observations during the summer of 1892 and the past month, I am now of the opinion that the grease traps provided on the kitchen drains of the general mess and of a number of officers' quarters at this post are little better than cesspools, and are of no use and are a menace to the health of the command. They require constant attention and a considerable expense in the way of disinfectants and water for flushing, and yet it is impracticable to keep them as pure as they should be to prevent bad odors arising from them. No obstruction of any drain at this post ever appears to have resulted from the absence of grease traps from the drains of the hospital or the nine sets of officers' quarters mentioned in the indorsement of the post quartermaster above mentioned. As they can serve no other useful purpose than to prevent such obstruction and are unnecessary for that purpose and are otherwise objectionable, it is respectfully recommended that all kitchen drains be connected directly with the sewer or special drain into which they now discharge and that the grease-trap tanks be filled up.

Disposal of garbage, etc.—The usual method is to collect in closed barrels or galvanized iron pails and transport to a dumping ground in the vicinity of the post. For convenience, ground near the inhabited area is selected, and the accumulations of years become so extensive as to be a nuisance and a reproach. Ashes and cinders may be utilized on roads or in filling, and if not required for such purposes their deposit is not injurious. Stable manure also can generally be used upon gardens; but there is at every post much unavoidable solid waste that should be destroyed, and a crematory of moderate size should be built at all the modern and permanent posts. Where the reservation is small and surrounded by civil communities it is imperative to dispose of the wastes in this way. A crematory was built at Fort Columbus in 1885, and rebuilt on a larger scale two years ago on plans of Lieut. H. J. Reilly, Fifth Artillery. It consists of a fire-brick chamber divided into three spaces by iron gratings which support the garbage. A tall chimney gives a powerful draft and the combustion is almost perfect. There is no offensive odor and the smoke is ordinarily scarcely perceptible. No special provision is made for consuming the products of combustion, but those living on the island have experienced no inconvenience from them. A furnace was built at the dumping ground at Columbus Barracks several years ago, but it proved inefficient and was disused. Now, however, there need be no uncertainty as to the efficiency of a garbage crematory. They have proved successful in many instances. It is understood that one will be built soon at Davids Island and another at Madison Barracks. One, having a capacity of 35 cubic yards, has been erected at Fort Sam Houston and one, of 8 cubic yards' capacity, at Fort Sheridan; Fort McPherson also has a crematory.

WATER SUPPLIES.

The subject of water supply has been agitated earnestly during the past year at many of the posts, with the result in most instances of carrying out or instituting improvements. The water wagon is now practically a thing of the past. It exists only at Fort Du Chesne and Eagle Pass. At the former it brings water from the Uintah River; at the latter from the hydrants of the neighboring town. In the east the analogue of the water wagon is found at only one post, Fort Wood, where, when the cistern supply of rain water becomes exhausted, purchases are made from the Croton Water Works Company and transported to the island in boats; similar conditions are found at Alcatraz Island in San Francisco Harbor.

At many of the posts no recommendations were made during the year, the water supply being understood to be satisfactory both as to quantity and quality. Among these were posts supplied from various sources, as rain-water cisterns, springs, ponds, running streams, wells, artesian wells, and city supplies, as follows:

From cisterns.—Jackson Barracks, Key West Barracks, and Fort Wood, just mentioned. Jackson Barracks has also a supply for police, fire, and other general purposes from the Mississippi River.

From springs.—Angel Island, Forts Huachuca and Mackinac, Mount Vernon Barracks and Forts Niobrara, Robinson, Sherman, Snelling, Supply, Townsend, and Walla Walla.

From ponds.—West Point.

From running streams.—Forts Assinniboine, Bidwell, Brown, Buford, Canby, D. A. Russell, McKinney, Missoula, Pembina, Ringgold, Sill,

and Spokane. At the first-mentioned post an effort is in progress to find artesian water. At Forts Brown and Ringgold the drinking water used is obtained from a condensing coil attached to the ice machine of the medical department. The remarkable change in the malarial sick rates of the former post since the condensed water was substituted for the impure water of the Rio Grande has already been pointed out.* The post surgeon at Fort Ringgold is of opinion that all the malarial fevers that occur in his command are contracted while the troops are on service away from the post. The value, he says, of the use of distilled water as a prophylactic against malarial and typhoid affections was first observed in connection with the employment of the condensed water produced in the process of manufacturing ice. When this fact was recognized a large condenser, yielding 2,000 gallons per day, was procured. The water is hauled to the quarters in a tank cart and kept for use in 24-gallon galvanized-iron cans.

From wells, mostly in river bottoms.—Forts Bayard, Hancock, Keogh, McIntosh, Riley, Sidney, Sully, Vancouver, Yates, and Whipple Barracks. Condensed water from the ice machine is used also at Fort McIntosh.

From artesian wells.—Forts Logan, McPherson, and St. Francis Barracks. The first-mentioned has also a connection with the mains of the city of Denver.

From city supplies.—Boisé Barracks, Fort Brady, Columbus Barracks and Fort Columbus, Davids Island, and Forts McHenry, Marcy, Mason, Niagara, Ontario, Plattsburg, Pilot Butte, Porter, Preble, Schuyler, Thomas, Trumbull, Wayne, and Willets Point.

The following extracts from the reports of Lieut. William F. Lippitt, at Eagle Pass, and Capt. James E. Pilcher, at Fort Ringgold, show the advance made in the past few years by the substitution of a piped supply for the water wagon and its barrels, usually old vinegar barrels obtained by courtesy from the Subsistence Department:

Camp at Eagle Pass.—The sanitary condition of the buildings at the camp is as good as possible in their present dilapidated condition. The drainage is surface, and efficient in this dry weather. The dry-earth system for the removal of excreta is well kept up and is efficient. During the past month the quality of the water has been bad, the water being very much discolored and at times showing traces of organic matter due to deficient filtration of the river water. The water company from which the water is obtained has promised to remedy this. The present system of water supply is a very bad one, especially for this place. It is impossible to prevent the dust from the town of Eagle Pass being blown into the barrels, and no matter what care is taken the water becomes offensive both as to taste and smell. Eagle Pass is a very dirty town, the authorities of which do not make the least attempt at keeping it in sanitary condition. The strong north winds, so prevalent here during the winter months, blow directly from the town, and carry with them large quantities of this dirt, which find their way into the water barrels and houses, and can not but be injurious. There have recently been several cases of malarial fevers here, which I can ascribe to no other cause. The post itself is kept in good sanitary condition, but beyond this no attention whatever is paid to such matters. The water has been sufficient in quantity, but the summer is approaching, when it is very difficult to keep a sufficient supply by the present system. I would, therefore, recommend that the water be brought by pipes connected with the town system.

Fort Ringgold.—The water supply is derived from the Rio Grande River. The pumping apparatus consists of two boilers, one of 35 and one of 50-horse power, two engines, two settling tanks and four storage tanks, together with their connecting pipes and water mains.

The engine house is situated upon the banks of the river. The engine drawing the water from the river is a Dean pump with double plunger, of 15-horse power and a capacity of 18,000 gallons an hour. It is located in a well 16 feet deep and 11 by 16 feet at the bottom, which is 13 feet above the level of low water. In this well is located also a Blake pump of 12-horse power as a reserve in case of breakage.

* See *supra*, p. 61; also Report Surgeon-General, 1892, p. 74.

The turbidity of the river water, due to the suspension of a large amount of inorganic matter, is extreme, and it can hardly be used with advantage in its natural condition. In order to permit the subsidence of the suspended matter, two settling tanks have been provided. These are situated upon the side of a small hill, respectively 18 and 27 feet above the level of the Dean pump, and 410 and 348 feet, respectively, from it. The settling tanks are 35 feet square and 9 feet deep and have a capacity of 83,560 gallons each. The water from the river is pumped directly into the upper settling tank through a 3-inch pipe. After the suspended matter has subsided, a process requiring from half an hour to eight hours, the clarified water is decanted through two 4-inch pipes into the lower settling tank. There it remains until it is needed for the storage tank, such silt as may still be present being meanwhile precipitated.

The distributing machinery consists of a Worthington duplex pump of 24-horse power, with a capacity of 20,000 gallons an hour, and four storage tanks, at a sufficient height to distribute the water by gravity. The clarified water flows by gravity through a 4-inch pipe to the Worthington pump, which stands on the floor of the engine house, and is forced through a 3-inch pipe into the storage tanks. These tanks are tub-shaped, with staves of Louisiana cypress, strongly banded by wrought-iron hoops, and each mounted upon a pier of solid masonry; they are 16 feet in diameter, 12 feet high, and have a capacity of 16,000 gallons each. A circulation throughout the four tanks is obtained by connecting pipes of 3 or 6 inch caliber, rendering them equivalent then to a single tank of 64,000 gallons capacity.

The hill upon the summit of which the storage tanks are located is 25 feet above the level of the parade ground, and they are further elevated by masonry piers to a height of 35 feet above the mean level of the garrison. At this mean level the pressure obtained is 45 pounds per square inch.

The water is carried from the storage tanks by one 6-inch and two 2-inch iron mains. The 6-inch main passes from the northeast side of the tanks down the hill 250 feet, on a line perpendicular to that of the officers' quarters, to a point 30 feet in the rear of the quarters, where it meets a line of 6-inch pipe 1,000 feet long, running parallel to the officers' line. Upon this main are situated five fire plugs, from which any of the officers' quarters, the hospital, and the quartermaster and commissary storehouses may be reached by a moderate length of hose. From this main pass off two 2 inch iron pipes, from which 1-inch pipes pass to small hydrants between the officers' quarters for watering the grass and trees, and to each set of officers' quarters supplying faucets in the kitchen and urinals on the first floor, and the bathroom on the second floor. These 2-inch pipes connect with another set of the same caliber, which completely encircle the parade ground, and send off a branch to the hospital. Upon this circle are situated four fire plugs for the fire protection of the barracks, guardhouse, and bakery, and the officers' quarters. The circle gives off in 1-inch iron pipes the water supply of the hospital, the barracks, and company bathhouses, the enlisted men's water-closet, the bakery, and guardhouse, the married soldiers' quarters, and contributes two hydrants to the post garden.

A 2 inch main, passing from the southeast side of the storage tanks, goes to the hay corral and to the commissary storehouse, supplying a fire plug to each, and to the engine house, supplying the boilers and the apparatus for the distillation of water. It gives off a 1-inch pipe for the supply of the noncommissioned staff officers' quarters.

A 2-inch main passing off from the northeast side of the storage tanks goes to the quartermaster and troop stables, supplying a fire plug there and at the quartermaster's storehouse. By 1-inch pipes it supplies the blacksmith shops and the water troughs of the stables.

Connected with the kitchen range of the hospital, barracks, and officers' quarters are water backs, with boilers of a capacity ranging from 60 to 30 gallons, by which hot water is supplied in kitchens for cooking purposes, and in bathrooms for bathing.

The hospital is fitted with an exceptionally satisfactory bathroom, containing two porcelain-lined tubs, with hot and cold water, and a shower bath, which will leave nothing to be desired when the repairs, for which estimate has just been made, are completed.

Each company occupies a small building in the rear of its barracks as a bath house. They are rather rudely fitted, each with two zinc-lined tubs, a shower bath, and a trough for washing the hands and face. Hot water is obtained in small quantities from the kitchen boiler, connections with which have been made during the past year; but the amount is altogether insufficient for the large number of men who should use it. A larger bath house, with ample boilers and efficient fixtures, at a point central to all the barracks, is proposed, but the plans have not been submitted to the medical department as yet.

The guardhouse has during the present year been supplied with a bathroom, containing a washing trough and a bath tub. It is hoped that a shower bath will soon be added as being altogether the most suitable apparatus for the locality.

Each set of officers' quarters has at the rear end of the second story hall a bath room supplied with a zinc-lined bath tub, with hot and cold water connections.

The garrison, with the exception of one set of officers' quarters, still lacks stationary washtubs, which are recommended to be introduced at an early date.

There is at the post a Hyatt patent water filter, with a capacity of about 15,000 gallons per day. This apparatus, however, has never been set up, the settling tanks supplying the clear water demanded for the ordinary needs of the garrison. But in the summer, when a larger amount is required, it is impossible always to supply clear water from the settling tanks. It is recommended that, to meet this emergency, the filter in question be put up.

All of the pipes used in distributing water are of iron, some of them plain and others galvanized, the character varying apparently according to the fancy of the purchasing officer.

The water obtained by the foregoing system is ample in amount for all purposes, but experience has shown that it contains a greater or less quantity of septic organic matter, rendering it unsuitable for drinking purposes except when boiled. The presence of a small percentage of alkali and other inorganic matter contributes to render it still less potable. This post was for many years a nidus for affections of a malarial and typhoid type, which were properly attributed to the drinking water. Distilled water is now supplied in ample quantities for drinking purposes, as a result of which these affections are eliminated from our records except as they are brought here from other localities. The value of the use of distilled water as a prophylactic against malarial and typhoid affections was first observed in connection with the employment of the condensed water produced in the process of manufacturing ice at the post. When this fact was recognized a large condenser was obtained, by the use of which 2,000 gallons of distilled water per day are obtained. This water is hauled to the quarters in a tank cart and kept for use in 24-gallon galvanized iron cans.

The heat was formerly a fruitful source of disease, but this is now very largely neutralized by the product of the ice machine, one of the most important features of the water system of the post. The machine is a Schuehle engine of 8 horse power, operating two freezing tanks, producing 42 bars of ice each, with a capacity of 2,940 pounds of ice per day, or over 1,000,000 pounds per year.

There are still at the post six cisterns, of a capacity varying from 30,000 to 100,000 gallons each. These were used for the accommodation of rain water at a period prior to the introduction of the settling tanks, and when the turbid river water was the only other resource for drinking water. These cisterns are useless now, and the post surgeon, recognizing a source of infection in their stagnant contents, has recommended that they be emptied and kept clean until they are needed again. They are located one at each side of the space between the two barracks fronting on the parade ground and at each end of the hospital, one in the rear of quarters No. 5, and one at the end of quartermaster's storehouse No. 34.

The cost of the pipes and fittings contained in the water system was approximately $2,780. The expense of maintaining the water system, including the ice machine, is about $215 per month.

The water supply of so many posts formed the subject of so much consideration, discussion, and recommendation during the year that it seems impossible to invite attention in a general way to the various points involved. The simplest method of dealing with the matter will be to refer briefly to the defects reported, the recommendations made, and the improvements accomplished or in progress at each of the posts, under their respective names, arranged alphabetically for convenience of reference.

Fort Adams, R. I.—The subject of water supply at this post is one of considerable difficulty. In 1888 well water was used, but this having been found to be of bad quality the water of the Newport Water Company was introduced. This water, however, speedily failed to give satisfaction. It is a surface or pond water, largely charged with vegetable impurity, and has been reported upon unfavorably by many public analysts and sanitary chemists. During the year the post surgeon invited attention to the matter and the well water and city water were again examined, the result in both instances being unsatisfactory. Suggestion was made of artesian borings, but the U. S. Geological Survey entirely disapproved of any effort in this direction. Thereupon the medical department recommended the use of a condenser capable of providing 2,000 gallons of drinking water daily. An estimate of

$1,850 for this purpose is understood to have been forwarded for consideration.

Alcatraz Island, Cal., is supplied with fresh water for drinking, cooking, etc., and salt water for baths, flushing of sewers, and use in case of fire. The latter is pumped from near the wharf to distributing tanks on top of the citadel. The former is brought by steamer from the pipes of the Spring Valley Water Company and forced by the pumps of the vessel into a series of twenty-one cisterns under the flower gardens of the citadel and also into tanks on its summit, to which it is raised by means of a windmill. The tanks supply the citadel, light-house, adjutant's office, hospital, etc., on the high ground, and the cisterns distribute to the buildings on the lower levels. The cisterns contain over 230,000 gallons, and are connected with each other at top and bottom so as to form but one reservoir. Each, however, if necessary, may be disconnected from the others. Question was raised during the year as to the purity of the water furnished by the Spring Valley Water Company. (See below, page 128.)

Fort Apache, Ariz.—The water supply of this post was taken from the East Fork of White River, about 3 miles above the post, and was led along the high ground bordering the river bottom in an acequia, which was often broken by cattle and in winter by frost. At the establishment of this military station the water thus obtained was pure, but in the progress of years it became more and more fouled by Indian settlements and the irrigation of farms in the river bottom above the intake. During the year there was dug in the bottom land a well 22 feet deep, which yields an abundant supply of cool, clear, and pure water. The ditch, however, is still kept open for general purposes and in case of need. The details of the water system from the acequia is given in Capt. N. S. Jarvis's report on the high sick rates prevailing at his post. See page 32.

Fort Barrancas, Fla.—The cistern supplies of rain water at this post will hereafter be disused in favor of water from two deep wells,* which are thus described by the post surgeon:

The water is supplied from two wells a few feet apart in front of the engine house. They are respectively 200 and 300 feet deep, both furnishing an abundant supply of potable water of good quality. The geological formation, as given from the borings, are, first, 56 feet of clean white sand; second, a stratum of blue clay or marl, 12 feet thick. At a depth of 260 feet another stratum of the same description is penetrated. Between these two are a number of small strata (2 feet) of yellow sand and clay, with layers of fine sand varying in color from white to a dirty gray.

The water is laden with iron rust from the pipes, due to an insufficient coating of coal-tar compound; it is also impregnated with grease from the packing of the joints. This, however, is a temporary disadvantage, which will disappear in the course of time. The water from the cisterns is still used for drinking purposes. * * *

The boiler is spoken of in the specifications as "the economic return tubular portable." It is of 50-horse power capacity, 44 inches diameter, 13 feet length, and made of $\frac{5}{16}$-inch steel, of 60,000 pounds tensile strength for square inch of section. The furnace beneath is 44 inches wide by 50 inches long. The whole structure stands 9½ feet high, 13 feet long, and 4 feet wide. The boiler has been tested under high pressure, and is considered perfectly safe under 80 pounds. It is usually operated under a pressure of 60 pounds steam. In the boiler room, and connected with the boiler by a 2-inch steam supply pipe, is a duplex water-supply pump with 10-inch steam and 6-inch water cylinders, 10-inch stroke. The pump is connected with the two wells by a 4½-inch suction pipe, and to the 4-inch cast-iron water-supply pipe by a wrought-iron discharge pipe of the same size. To utilize excess of power an engine has been constructed to run a cross-cut saw for sawing fire wood.

Connected with the discharge pipe, as mentioned above, is a system of 4-inch cast-iron smooth-bore water-supply pipes, hub and spigot joints, well calked with hemp yarn and lead; the pipes are laid 2 and 3 feet under surface; each pipe is 4

*See analysis of water, p. 528.

inches diameter, one-half inch thickness, 12 feet length, 3¼ inches depth of socket, 264 pounds weight. The pipes were cleaned and coated with coal-tar composition before laying, and were found free from sand holes and other defects. Thirteen double-nozzle fire hydrants and three single-nozzle, all with gate valves, valve boxes, and covers, are connected by 4-inch T branches, with the water main at appropriate places. Three of the single-nozzle hydrants, from their proximity to manholes of the sewer system, are used for flushing the sewer. In addition to the above there are three yard hydrants, and opposite each house the water main is tapped by a brass stop-cock ferrule with box and cover.

The standpipe in rear of quarters No. 13 consists of a covered steel tank 20 feet in diameter, 15 feet high, supported on a truss 40 feet high. The plates used in the tank are one-fourth and three-sixteenths of an inch thick, well riveted, and joints well calked, so that it is perfectly water-tight. The truss is of wrought iron and perfectly substantial; it rests upon foundation piers of brick and stone anchored to the same with iron rods. A wrought-iron ladder is in place; lower half removable. The roof of the tank is constructed of iron rafters covered with corrugated iron. The 4-inch cast-iron supply pipe is connected with the water main by a gate valve at a point south of the standpipe. The 6-inch wrought-iron overflow pipe runs from a point in the tank near the top down through the bottom of the tank into the ground, where it connects with a 6-inch sewer pipe leading off about 60 feet. The tank has a capacity of about 15,000 gallons. When full its subjects the pipes to a strain of 40 pounds pressure, which is well borne.

Benicia Barracks, Cal.—The chief dependence of this post for drinking and kitchen supplies is on rain water, collected in eight large cisterns under the principal buildings. It has also two wells, from which water is pumped by windmills into tanks, and distributed by pipes to the houses. This water contains alkaline earthy salts, and although used chiefly for washing and baths, is not objectionable as drinking water. The quantity, however, of both of these supplies is liable to be deficient in summer, when recourse is had to the city supply, with which there is a connection; but this consists of surface drainage charged with alkaline and earthy salts and more or less of organic matter.

Fort Bliss, Tex.—Two deep wells have been drilled at the new post, the first 236 feet deep, the second 309 feet. The water is somewhat hard, and presents the anomaly sometimes exhibited by deep-well waters of containing nitrites with no concomitant indications of the presence of organic matter. Its temperature is about 70° F. The supply is limited only by the capacity of the pumps, and is believed to be practically inexhaustable.

Fort Bowie, Ariz.—The water supply is from Bear Spring, 1 mile east of the post. The water flows by gravity through pipes to a storage reservoir, whence it is pumped into distributing tanks. Formerly this supply was amply sufficent for the wants of the post; but during the past two years, which have been unusually dry, it has been needful to supplement it by hauling from another spring on a lower level. The post surgeon recommended a pump for this lower spring, but the post commander objected that this would necessitate a new water plant or the moving of the engine house and machinery and the building of new reservoirs at great expense in either case. Recently the unusual and continued dryness has caused Bear Spring to dry up, and the lower spring, which formerly yielded fourteen wagon loads per day, yields only six loads or 3,800 gallons. There is a third spring in the vicinity, but it is in a gulch into which enters all the drainage from the earth pits and sewers of the post. It is hoped that the summer rains will speedily replenish the water supply, otherwise the post will have to be abandoned.

Fort Clark, Tex.—The water supply of this post is from Las Moras Spring, which rises in the center of a pool one-eighth of an acre in superficies and 2 to 15 feet deep. This pool is filled with vegetation

and is subject to inflow of surface washings during rains. Malarial fevers have been attributed to its use.* The medical director was of opinion that this spring is connected by underground channels with the drainage of the town of Brackettville, but an analysis of the water did not sustain this theory of its origin. Chemical investigation showed that the water issuing from the spring was of a much purer character than that taken from the surrounding pool. It was therefore suggested by the post quartermaster to protect the spring water by confining it within an iron cylinder, 15 feet in diameter and 18 feet high, embedded in a base of cement on the surface of the rock. The latest reports from this post represent the project of sinking a cylinder on the plans drawn by the quartermaster as at a standstill, and the spring flooded with storm water. The spring water is used for general purposes, but is boiled before use in the barrack rooms. Condensed water has been issued, but is disliked by the men on account of a taint of iron rust and machine grease. An estimate has been forwarded for material and labor to perfect the condenser.

Fort Custer, Mont.—The water at this post is pumped from the Little Horn River into distributing tanks. Offal from the slaughter-house of the Crow Agency, some miles above the post, is thrown into the river and is seen floating past the intake of the supply. Efforts are being made to prevent this contamination.

Fort Douglas, Utah.—The water of this post, from the creek in Red Butte Canyon, was examined at the instance of the post surgeon and found to be of excellent quality.†

Fort Grant, Ariz.—This post has suffered from a scarcity of water for several years back. Last year the piping was extended 13,500 feet farther up the canyon under the impression that a permanent supply would thus be procured. The expectation, however, was not realized, for recently the water supply again gave out, and it is now understood that plans and estimates for a well are under consideration.

Jefferson Barracks, Mo.—In view of a somewhat notable prevalence of typhoid fever in the city of St. Louis the depot surgeon recommended that the water supply be boiled and filtered. This supply is derived from the city mains, but before its distribution it is passed through two filters—cast iron tanks filled with broken stone, gravel, and sand—in the water tower. One of these became unserviceable and an estimate for a new one was disapproved on the ground that the object could be accomplished by the repair of the old one. Prior to 1888 the river water was pumped directly into the post, and much sickness was attributed to its use; but in reporting the changes effected during that year the depot surgeon stated that—

> The connection with the St. Louis mains has been a crowning success, for from the delivery of that water supply dates the great change in the sick report of the depot.

The admissions per thousand of strength in 1885 were 3,115; in 1886, 3,008; and in 1887, 2,133. The continuance of these high rates called imperatively for action, and the connection with the St. Louis mains was effected, with the result that in 1888, the year in which the change was made, the rate began to decline, and in 1889 it fell to 966, and in 1890, 1891, and 1892 it was, respectively, 1,000, 1,008, and 875. The water of the Mississippi River is decidedly unfit for the supply of a great city like St. Louis or for that of an important military post, as it is always liable to convey the infection of typhoid fever from the sewage of settlements higher up; nevertheless it is at present the best

* See p. 449. † See analysis p. 528.

available both for the city and the recruiting depot. It is at times muddy, as are most of the supplies taken from large rivers. Sedimenting the water or filtering it improves its appearance and tends to remove any malarial element that may be present; and to the sedimentation in the St. Louis basins, and the filtration in the water tower of the depot, must be attributed the great diminution of malarial diseases that lowered the admission rates as above stated. Neither of these processes, however, can be depended upon to remove typhoid infection. This can be readily understood when it is remembered how often typhoid fever has been propagated by well waters that have undergone a thorough natural filtration.

Leavenworth Prison.—The river supply at Fort Leavenworth and the Military Prison has repeatedly been pronounced unsafe by sanitary authorities, and suggestion has been made of experiment to determine the possibility of obtaining a supply by well-driving. The occurrence of four cases of typhoid fever last autumn led the prison surgeon to renew this suggestion, indicating a valley northwest of the prison as a proper site for the experiment. This was authorized by the major-general commanding, and borings are now in progress to determine the practicability of such a system.

Madison Barracks, N. Y.—The water supply of Madison Barracks is obtained from Black River Bay in front of the post and a short distance below the outfall of the sewers. The water on analysis gave no indication of the presence of sewage from the local sewers nor from the settlements on the river above the post. Nevertheless, as the direction of the currents showed the possibility of sewage being carried to the intake, it was decided to extend the inflow pipe 450 feet into the bay. While this was in progress typhoid fever, introduced from Binghamton, N. Y., gave rise to twenty-seven cases with two deaths.* Samples of water from the existing intake and from the proposed position were found to give no indications of the presence of sewage; but the spread of the fever among the troops brought fully to mind the dangers attending a polluted supply, and led to the condemnation of the proposed intake as being not sufficiently out of the line of sewage contamination. Henderson's Bay, on the south side of Horse Island, furnishes lake water without admixture of the dark colored water of the river. This water has been analyzed with satisfactory results and has been recommended for the supply of the post.

Fort Meade, S. Dak., is on the south bank of Bear Butte Creek, about a mile below, or to the eastward, of the town of Sturgis. For several miles above Sturgis the creek is dry; but at the east end of the town, where the creek bed is confined by a rocky canyon, the water comes to the surface and flows past the post to the Belle Fourche and Cheyenne rivers, 20 miles below, sinking and reappearing several times on its way. On the north side of the bed of the creek, a short distance above its entrance into the canyon, are three springs purchased in 1888 for $3,000 for the supply of the post. A 2-inch wrought-iron pipe connects two of the springs; a 4-inch pipe unites the conjoined springs to the third one, and a 6-inch main leads the water to the suction valve of a pump at a level 27 feet below that of the springs. The pump forces the water through a 4-inch pipe into a reservoir, from which it descends for the supply of the post.

There appears to be no doubt as to the sufficiency of the supply nor as to its present quality. It is organically pure; but its hardness de-

* See page 439.

tracts from its value from an economic point of view. In November last the department commander instituted an inquiry into the character of this supply on account of the suggested likelihood of its becoming contaminated by the sewage of Sturgis, as that town was introducing a water supply from Warren's Creek in the mountains, 3¾ miles south of the town site, and its waste water would find its way into Bear Butte Creek about 800 yards above the springs. A board of officers failed to agree on the subject, the point at issue being whether the springs are independent springs or merely the bedrock flow of the creek brought to the surface by the shallowness of its overlying gravel. In the latter case there would be every likelihood of future contamination. If on the other hand, the springs are independent of the creek water, the question of contamination might be dismissed. A full consideration of the evidence indicates that the water comes from the limestone strata of the adjacent hills rather than from the creek. Floods affecting the creek do not correspondingly alter the flow of the springs. In any event, the protection of the springs from contamination by cattle, camps, or surface inflow, with the occasional testing of the water for organic impurity, is all that is at present deemed needful. A softer water for the post is desirable and could be had from the Sturgis supply, but the price asked, $27,500 for five years, is considered exorbitant. It is understood that the water company has recently submitted another proposition for the consideration of the authorities. After the new sewer system of Sturgis was put in operation samples of water from the creek, the springs, and the supply pipes of the post were examined, the result* showing that the sewage in no way affected the water supply of the garrison.

Fort Myer, Va.—The water supply of Fort Myer, Va., is derived from three wells, each about 25 feet deep, 10 feet in diameter, brick-lined, and suitably covered. It is pumped from these into three elevated tanks having a combined capacity of 40,000 gallons. This quantity constitutes a full daily supply for the present garrison, but during the past summer and autumn, which were unusually dry, the wells were not so productive, yielding at one time only about 5,000 gallons a day. Coincident with this deficiency in the supply was the development of remittent fevers,† and there is no doubt that the one was causally related to the other. At the site of the wells there was originally a spring, but the spring water is now lost in the preponderance of subsoil water, which drains into the wells from the elevated plateau on which the post is built. The water is essentially a rain water which has flowed over a soil rich in decaying vegetation, and which, in passing through the loose sand in which the wells are sunk, has not undergone a natural filtration sufficient to purify it. Its organic matter is in excess, and although the presence of nitrates shows that the filtration has been partially useful as a purifying measure, the associated presence of nitrites indicates that the source of the impurity is so near to the wells that the process of change is still in progress when the water is distributed for use. Such wells are especially prone to disseminate remittent fevers, and to become infected with typhoid, particularly when their waters are low. As a remedy for this condition the supply of the post by connection with the mains of Washington, D. C., was suggested. During the dangerous season of low water in the wells, boiling the water to be used as a drinking supply was recommended. Freedom from disease caused by the use of the well water could also be assured by dis-

* See page 528. † See page 450.

tilling it. It is as yet not at all certain that filtration effected by artificial means can be relied upon to free a water from the causes of remittent fever, although no fact in sanitary science has been so fully demonstrated as the purifying influence in this respect of the natural filtration into deep wells. Congress, however, failed to authorize connection with the mains of Washington, D. C., whereupon, to prevent a water famine such as existed last summer the Quartermaster's Department made arrangements for pumping from the Potomac River near the Aqueduct Bridge into newly-constructed tanks for police, stable, and fire uses. To provide a supply of wholesome drinking water an artesian well will be bored.

Presidio of San Francisco, Cal.—The water supply of the Presidio is from the flume of the Spring Valley Water Company, which takes its water from Lobos Creek, in the southwest part of the reservation. It furnishes over 2,000,000 gallons daily to the city, 140,000 to the post, and 25,000 to Fort Point. The post supply costs nothing to the United States. Analysis, October, 1892, showed the water to be of excellent quality.

It is claimed by some that the extension of the city along the Presidio Heights to the south of the post will contaminate this supply at an early day, and that in consequence provision should be made for an independent supply for the post. The post commander therefore recommended that wells be sunk west of the post and near the road to Fort Point to procure a supply from the watershed of 125 acres west and south of the road referred to. The area is bare and easily protected from trespass. The rainfall of 20½ inches would amount to 70,000,000 gallons, from which the proposed wells would draw about 50,000,000. The water is or would be merely surface water. It has been tapped at 55 feet depth at the National Cemetery, near by. This well is worked by a windmill and gives 3 to 5 gallons a minute.* This recommendation having been referred by the Major-General Commanding to the Surgeon-General, the latter remarked as follows:

> It is probable, as represented in these papers, that a plentiful supply of good water can be obtained by sinking the wells on the reservation. At this time, however, the water of Lobos Creek seems to be exceptionally good. Precautions, however, should be taken to keep the flume in good order and free from dirt and impurities. I am informed it is now considerably out of repair. The proposed sewer runs across the southeast corner of the reservation and will not affect the water supply. In regard to the future disposal of the sewage of Pacific, Jackson, and Washington avenues, as they in the future will become occupied by dwellings, I am informed that it can be safely carried off, without infecting Lobos Creek, by sewers constructed of vitrified pipe and emptying either into the bay or the ocean. Aside from these sewers, danger of contamination of Lobos Creek exists from the watershed on the south side of the reservation. It is believed that it can be made little or none by properly constructed drainage, depending, of course, on the depth, now unknown, at which the subsoil water flows to the creek after soaking into the soil. Taking into view a possible contamination of the Lobos Creek water, it is recommended that a well be dug as a matter of experiment.

During the past year the post commander communicated with the surgeon in charge of the marine hospital on the reservation to effect a discontinuance of the cultivation of vegetable gardens at the hospital. These gardens, covering 40 acres, are heavily manured and irrigated, the drainage being into Mountain Lake. They are cultivated by persons unconnected with the hospital, who supply the small amount required by it for the privilege of selling the surplus for their own profit. By the terms of the consent given by the War Department to the Treasury Department to occupy a part of the Presidio Reservation

* See analysis, p. 528.

for a marine hospital, the control of both Mountain Lake and Lobos Creek was expressly reserved by the War Department, the evident object being to insure control of the water supply of the post. The water supply of the Presidio has been much discussed during the past twenty years. The following extract from a report by Col. Joseph R. Smith shows the character of the criticisms:

January 18, 1878, Surg. J. C. Baily reported that the drainage from truck gardens on north side of ground from which Spring Valley flume received its supply "is almost entirely into water sources. * * * A large garden south of Marine Hospital, as well as hospital stable, drains indirectly into the spring. A small garden at north end of lake and one on west side also drains into it. * * * The drainage of the Marine Hospital is almost entirely into the lake."

October 26, 1882, a board was ordered to examine and report the facts as to the drainage from gardens on Lobos Creek into the spring supplying Presidio, etc., with drinking water, and to what extent the wholesomeness of the water will be affected thereby, and to recommend the necessary action. The board consisted of the present Surgeon-General Sutherland, of Surg. J. C. Baily, and Maj. Randol, First Artillery. It examined the ground and reported that "One of these gardens is situated on the Marine Hospital reservation and the other on the Presidio reservation. Both of them border on Lobos Creek and the springs that feed it. The one on the Marine Hospital reservation is the most objectionable, as the entire ground drains into the creek, while a small portion of the garden on the Presidio reservation is on higher land and slopes slightly from the creek. Both of these gardens are covered with hundreds of tons of manure from which an infusion drains into the water of the creek, which must even now affect its wholesomeness, and during the rainy season will make it very impure and unfit for use. The board therefore recommends that both of these gardens be vacated as soon as practicable; that from this date no manure be put on the ground, all cultivation of the gardens cease, and that when vacated the sites be sown with grass seeds," and that "the houses used by the gardeners as a dwelling, stable, cow sheds, etc., be removed when the gardens are vacated."

Action as recommended was opposed by the authorities of the Marine Hospital and not carried out.

January 29, 1883, the board made a further report that "it adheres to the opinion expressed in its report for October 26, 1882, that the infusion from hundreds of tons of manure which drains into the creek must even now affect its wholesomeness, and during the rainy season make it very impure and unfit for use; and it respectfully renews the recommendation made in that report."

March 18, 1883, Maj. W. A. Jones, U. S. Engineers, addressed a letter to the adjutant-general of the department which so well covers some facts and considerations that I can not do better than quote a portion: "I have made a minute examination of the catchwater basin that drains into the sea through Lobos Creek, and find it to be substantially as shown on the map herewith, which also shows the gardens along said creek. The area of this basin is about 3.35 square miles. The escape of water from it has been largely modified by drifting sand, which now covers nearly the whole of it. This sand holds the water in a subterranean basin which has its outlet in the springs along Lobos Creek. On the borders of this basin are the Chinese, and portions of the Odd Fellows, Calvary, and Laurel Hill cemeteries. On the flats are extensive vegetable gardens and a few milk and hog ranches. The Marine Hospital and its gardens along the creek on the Presidio reservation are entirely on this watershed. Furthermore, the city is rapidly spreading toward it, and the day is not far distant when it will be extensively built upon. "There are now considerable settlements upon it. The discharge from Mountain Lake is through Lobos Creek, the water flowing subterraneously through the sand, first to the southward, and thence bending around to the northward into the creek. The deflection is caused by a sandstone ridge which runs along the western border of the lake. This ridge has been tunneled by the water company with a view of using the water from the lake in case the creek supply falls short. Water is now drawn through this tunnel to supply the flume from which the gardens on the Presidio reservation are irrigated.

"To what extent or distance the propagating poison of zymotic diseases can be transported by water after it gets into the ground can not, in my judgment, be estimated. In the present instance it is probable that the subterranean reservoir is so large that any organic pollution it may receive is either oxidized or diluted to such an extent as to be harmless by the time the water emerges at Lobos Creek. This can not be said, however, of the drainage water from the Marine Hospital and Presidio gardens along Lobos Creek. Here the contamination is immediate, and in times of considerable rainfall quite apparent to sight, taste, and smell. There are

at present enormous quantities of manure spread over these gardens, and should a short season of considerable rainfall occur the water would certainly be rendered offensive from it. The supposition that a stream of water flowing 2,000,000 gallons a day through a small flume of redwood boards may, once in a while, be turned to a coffee-brown color from the coloring matter in the redwood is at variance not only with common sense, but with sound chemical judgment. It should be remembered that in ordinary circumstances the Lobos Creek water has, to all appearances, been of a superior quality It has been used by three military posts and a portion of the city with considerable satisfaction, and in times when it has not been satisfactory the trouble has been directly and reasonably traced to the manure on these gardens. The position taken by the Marine Hospital authorities is therefore substantially that because this water supply may possibly be contaminated from outside sources they may certainly contaminate it for the sake of getting some vegetables for nothing. I am satisfied that when it shall reasonably appear that for a paltry saving of $150 per month to a Government hospital the lives and health of a great many people are imperiled, or even by any remote possibility imperiled, the honorable Secretary of the Treasury will concur in the views of the military authorities, which are that all gardens draining immediately into Lobos Creek should be abolished. The policy of the military authorities should be undoubtedly to peremptorily stop all pollution of this water supply that is immediate and apparent, and whenever it shall reasonably appear that the water is polluted from sources beyond their reach the use of it for drinking and cooking purposes should be stopped and the supply for this purpose drawn from the immediate watershed of Mountain Lake, an area that is entirely within their control, and whose system can be kept clean and wholesome.

"This brings me to some general considerations that deserve attention. The day is rapidly approaching when the expensive system of keeping up a great many small military posts can be changed, and the cost of the military establishment very much reduced by concentrating the Army at a few important points; not only the economical administration but the discipline, efficiency, and general good of the Army would be very much improved by such a change in this direction. In such event the city of San Francisco would unquestionably be a point where a considerable number of troops could be effectively stationed, and they could be most economically kept here by concentrating the whole garrison at one post. (Of course the military prison at Alcatraz Island would require separate treatment.) The obvious place for such a post would be the Presidio reservation. As the future transcontinental railroads will have to go either through or alongside this reservation, supplies could be landed here in bulk from both ship and car, and a great saving in transportation effected. The site is not only advantageous for quarters but roomy for military maneuvers of all kinds. Troops of all arms can be instructed here with very great advantage to both officers and men, and in time of need can be easily distributed among the harbor forts or rapidly sent to any points in the Pacific coast region. In time of peace to dilute the small garrison of a city among a number of small posts makes the establishment unnecessarily expensive, and at the same time cripples the possibilities in the way of instruction, discipline, and general efficiency.

"It thus becomes apparent that it will not be long before the whole of the water in Mountain Lake will be required for the use of the Presidio garrison, and as it will then be necessary to keep the watershed that supplies it clean, the presence upon it of such an establishment as a marine hospital, wherein are collected and treated the diseases of all creation, will not be compatible with the best interests of the Government."

What action, if any, was taken in consequence of the foregoing I do not know, but whatever was done, the nuisance was not abated, and December 28, 1889, the commanding officer, Fort Mason, reported that "the manifest condition of the water supply at this post, derived from stream on the Presidio reservation at a point within the marine hospital grounds, and the frequent reports of the post surgeon as to its poor quality for domestic uses, led to recommendations for the improvement by filtration." He also calls attention "to a certain and prolific source of contamination by the Chinese gardeners and others in the marine hospital gardens which surround the source of water supply of the Presidio, Fort Mason, and a considerable portion of the inhabitants of the city of San Francisco."

I am constrained to add that examination of official reports in the office of the medical director shows no disease to have occurred since then at the Presidio which was due to the use of the drinking water in question.

The constantly increasing population of the watershed furnishing the drinking water must be accompanied with a proportionate increase of contamination.

The probable approach of cholera demands prompt attention to the water supply, the water being a frequent means of spreading the disease, and therefore a prudent foresight demands that the recommendations made by the board and engineer officer heretofore quoted, be carried into effect or that a new source of supply of water be found for the Presidio.

Fort Reno, Okla.—The water supply of this post has been a cause of much anxiety to medical officers for many years back. The main source, North Fork of the Canadian, was supplemented at first by wells and water wagoned from Caddo Springs, 4 miles distant. For three or four years back only one well has been used; the others were closed on the recommendation of various medical officers. Some of the disused wells have been converted into cesspools. The river water has been condemned by repeated analyses and the well regarded doubtfully. Caddo Spring water was used at first only by officers. The prevalence of sickness among the men, as compared with the good health of the officers and their families, has frequently been a subject of observation in connection with the fact that the latter do not use the river water, but have their supplies wagoned in kegs from Caddo Springs. The number of cases of sickness among the men at one period led Capt. J. Van R. Hoff, then post surgeon, to urge the introduction of the spring water for general use. Nevertheless an allotment was made to sink an artesian well to the water shed which has its outlet at the springs. The well was bored to a depth of 400 feet, when an accident put a stop to further work at that point. The medical officer then on duty urged the piping of the water from the springs as being feasible and not expensive, and the construction of cisterns to utilize the rainfall, in both of which recommendations he was sustained by the medical director, but the contractors meanwhile recommenced drilling at another point. Meanwhile also, on account of sickness at the post, attributed to the well water, a communication was sent by the Surgeon-General to the Secretary of War recommending that steps be taken to secure a continuous supply from Caddo Springs. The post commander directed the closure of the well. This officer, it may be stated, agrees with the post surgeon and medical director that a good supply of pure water can be had from Caddo Springs.

In February of this year it was learned that the artesian boring had reached a depth of 1,220 feet, and that, as the director of the Geological Survey had officially stated there was a possibility of getting water at this point, the necessary expenditure for sinking 500 feet deeper was authorized. This boring appears to have been a great mistake. It would have been much better to have piped from Caddo Springs, or even to have dug a well in the river bottom above the post.

San Carlos, Ariz.—The supply is from a well 8 by 8 by 34 feet in the river bottom. It gives a daily flow of 144,000 gallons in winter and 45,000 gallons in summer. It is pumped into a 19,000-gallon tank and distributed by gravity. The quantity used daily equals the summer capacity of the well, so that every day in that season it is pumped dry. The wooden tank is rotting and warping below, and so shrunken above that it can not be filled; the water runs out through the seams. The analysis of this water is given on page 134.

Fort Sheridan, Ill.—Some trouble was experienced during the winter by the blocking of the intake by ice. The post surgeon urged this as another argument in favor of carrying the intake further into the lake. Water drawn in March from one of the faucets in the hospital was decidedly impure.*

Fort Stanton, N. Mex.—The water is derived from a well 23 feet deep and 3 feet in diameter, situated only 20 yards from the Rio Bonito, a small stream subject to floods in certain seasons, but dry during late summer and autumn. It is pumped into a distributing reservoir at the

* See analysis, p. 528.

rate of 4,000 gallons an hour at one time without making any change in the water level, while at another the supply becomes inadequate for the needs of the post. The water is hard, and has on several occasions been accused of occasioning dysenteric troubles. Two years ago a well was sunk to the depth of 93 feet, when the attempt was given up, as the supply obtained was not worth pumping. Subsequently, in 1892, it was proposed to dig another well of larger diameter, and money was allotted for this purpose; but in the mean time a proposition by a citizen of the neighborhood to drill a well not less than 150 feet deep, which would give 15,000 gallons every twelve hours, was accepted. Work is now in progress on this well.

Fort Warren, Mass.—The deficiency of water at this post will soon be remedied by connection with the system of Boston by an extension of the 6-inch main which now supplies Gallope's Island.

Fort Washakie, Wyo.—Complaint was made of the quality of the water supply from the South Fork of Little Wind River; but on examination the water was found to be that of a pure mountain stream.*

Fort Wingate, N. Mex.—The water of the Ojo del Oso at this post was examined during the year.* Maj. W. Matthews reports as follows concerning it:

This spring has long been a noted locality in New Mexico, and before the establishment of a garrison here the beautiful grove that surrounded it was a favorite camping ground for freighters and travelers. Its existence determined the location of this important garrison.

The spring gushes from the foot of the Zuñi Mountains, 140 yards behind and south of the rear of the line of officers' quarters at Fort Wingate; it is shaded by oak, cedar, and willow trees of unusual size and undoubtedly of great age. Its altitude above the sea is almost exactly 7,000 feet. It discharges water at the rate of about 170 gallons per minute. This supply is not only ample for all the domestic and hygienic needs of the post with its system of pipe supply and sewerage, but it keeps green many lawns in front of the hospital and officers' quarters and serves to irrigate the post garden of about 20 acres. No doubt if it were necessary to cultivate a larger garden here the water could be made to cover more ground. The vegetables raised in this garden by means of the abundant water draw first prizes every year at the Territorial agricultural fair.

This spring is but one of several springs of similar character which surround the Zuñi Mountains and make agricultural settlements possible at different places around their base. It probably draws its supply originally from the rains and snows of these mountains, which rise to heights of 8,000 and 9,000 feet, are covered with heavy pine forests, and receive abundant precipitation both in summer and winter. But it is reasonable to suppose that the spring finds its more immediate source in very deep strata of these mountains, for the volume of its water is invariable from month to month and from year to year—the wettest seasons do not increase and the dryest seasons do not diminish it.

There is a core of granite in the center of the Zuñi Mountains, but the outer slopes consist largely of limestone and calcareous sandstone, the latter often highly colored and showing evidences of the plentiful presence of iron. These stratified rocks no doubt part with much of their substance to the water and load it with its notably abundant earthy constituents.

It is very hard water. It deposits in a short time deep incrustations on the inside of all vessels in which it is boiled. It is unfavorable to the uses of the laundry and tends to roughen the skin of those who wash in it.

For most persons I believe it to be a healthy water to drink; but I have had some cases of lithiasis and irritable bladder which seemed to be aggravated by it and were ameliorated by the use of distilled water or of Bethesda water or other waters imported from the East.

There is no reason to suppose that in its underground course this water can be subject to any important organic contamination, and the portion used here for drinking purposes is well protected after it issues from the ground. The natural outlet is covered by a house, which is locked. From this the water passes through an iron pipe to a small stone reservoir, which is also housed and kept under lock and key. Close to the reservoir is the steam pump which forces the water up to the top of a

* See page 528.

neighboring hill high above all the buildings in the garrison. Here the water is stored in a large stone reservoir, which is thoroughly protected with a substantial and well-ventilated house. The pipes of the post are supplied from this large reservoir. The overflow from the smaller reservoir near the spring passes into the irrigating ditches to water lawns and gardens.

There is only one house—a set of officers' quarters—at the post built at a higher level than the spring; but this house is about 125 yards from the spring, and is separated from it by a prairie.

Fort Yellowstone, Wyo.—Capt. C. M. Gandy reports, concerning the new supply at this post, as follows:

The "new post" is supplied with water from Clematis Creek, a mountain stream, a reservoir being formed by a dam thrown across it shortly before its emergence from the ravine down which it flows. Extending from this reservoir to the northwest corner of the post is a cast-iron 4-inch main, boxed and laid 6 feet below the surface. This main has a fall of 128 feet between the points named. At the corner of the post the main branches, each branch retaining the original diameter of the main. The branch in front of the quarters and storehouses is for fire purposes, having no connection with any buildings, but having on it six 3-inch fire hydrants, from one of which the sewer is flushed through the medium of a 3-inch hose and the first manhole. On a line with the rear of the officers' quarters the northern branch is tapped by a 3-inch iron galvanized service pipe from which individual set of quarters receives a branch, each house pipe being provided with a "stop and waste cock." In the same manner the barracks washroom and men's closets are supplied and the like pipe taps the main to supply a trough in rear of the cavalry stables. There is no water in either of the barracks kitchens or noncommissioned staff quarters, the former drawing its supply from the cock in the washroom and the latter from an outdoor hydrant near the dead end of the main. On this branch are three fire hydrants in apposition, respectively, to the barracks, the stables, and the noncommissioned staff quarters. There is no record of any analysis of the water, and while possessing considerable hardness, both temporary and permanent, it is believed to be of good quality. It probably produces mild intestinal disorders in persons unaccustomed to its use. The reservoir being unprotected by a fence, it is possible that its use as a drinking place by animals, both wild and domestic, may become a source of contamination; it is not believed that this has occurred to any great extent thus far. Both the amount of supply and storage capacity are ample.

Camp Lamont, Jackson Park, Chicago.—The medical officer at this camp invited attention to the impure water supply derived from Lake Michigan, the sewage contamination of which is notorious. The representation was made that a large sewer emptied into the lake at each end of the fair grounds, and the sewage of the park itself was returned to the lake after only 60 per cent of its organic matter had been removed. The intake was 1 mile from the shore, but sewage had been traced as far as the crib. The water as supplied contained 500 to 1,200 bacterial colonies to the cubic centimeter. As the rules of the World's Fair authorities against fire did not permit of sterilization by boiling, and as the methods of filtration in use on the grounds could not be trusted to remove infection from the water, another source of water supply was imperative, particularly as it was understood that the military cadets were to form part of the garrison. Typhoid fever would have been as prone to occur among them under the conditions of their encampment on the fair grounds as among a regiment of raw troops during time of war. Outbreaks of this fever were of too frequent occurrence during the war of the rebellion; but enough is now known concerning their causation to enable us in many instances to prevent them. The proposition of the commanding officer to introduce a supply of Hygeia water was therefore earnestly indorsed by this office.

Tabulation of analytical notes.

Water sample.	Total solids.	Chlorine.	Ammonia.		Oxygen by permanganate.	Nitrites.	Nitrates.	Remarks.
			Free.	Albuminoid.				
Fort Adams, R. I.:								
East well		2.24	.021	.017	.324	Present.	Present.	Use not authorized.
West well		2.2	.005	.0075	.104	Traces.	Present.	
Newport supply		2.7	.003	.020	.500	None.	Trace.	
Fort Barrancas, Fla.:								
Spring	10.0	1.0	.006	.003		None.	None.	Coloration on ignition slight and evanescent.
Artesian well	3.0	1.4	.016	.002		None.	None.	
Fort Bliss, Tex.:								
East well	34.4	2.4	.002	.002	.028	Present.	Trace.	Total hardness, 14°; permanent, 10°.
West well	44.4	3.3	.002	.002	.024	Present.	None.	Total hardness, 21.5°; permanent, 12.5°.
Fort Clark, Tex.:								
Distributing pipes		1.3	.001	.002	.048	Trace.	Present.	The traces of nitrous acid reported as very faint.
Center of pool		1.3	.009	.005	.064	Trace.	Present.	
Margin of pool		1.3	.010	.0055	.084	Trace.	Present.	
Brackettville wells	60.0	6.5	None.	.003	.072	Trace.	Present.	
Fort Douglas, Utah:								
Reservoir	38.0	1.7	None.	.002	.018	None.	None.	Organically pure.
Hospital delivery	42.0	1.7	None.	.0025	.016	None.	None.	
Madison Barracks, N. Y.:								
Barrack tap		.17	.0037	.018	.74		.01	Use not authorized.
		.22	.0039	.019	.70		.01	
Intake well		.16	.006	.034			.01	
Proposed intake	12.2	.5	None.	.007	.324	None.	None.	
Henderson Bay	13.0	.5	None.	.007	.240	None.	None.	
Fort Meade, S. Dak:								
Spring nearest creek	46.6	.4	.0145	.005	.180	None.	None.	Total hardness, 28°; permanent, 21°.
Hospital supply	46.6	.4	.015	.005	.112	None.	None.	Total hardness, 30°; permanent, 22°.
Creek below sewer	11.7	.4	.0095	.012	.68	None.	Present.	Total hardness, 11.5°; permanent, 10°.
Presidio of San Francisco, Cal.:								
Lobos Creek supply	27.0	2.4	.002	.004				
Cemetery well	40.9	6.7	.004	None.		None.	None.	
San Carlos, Ariz.:								
Well	65.0	17.2	.003	.0025		None.	None.	Total hardness, 42°; permanent, 17°.
Hospital delivery	64.5	17.2	Trace.	.0045		None.	None.	
Fort Sheridan, Ill	11.0	.4	.0055	.0035	.340	Present.	Traces.	
Fort Washakie, Wyo:								
River water		1.1	.003	.0055	.128	None.	None.	Use of this water not authorized.
Well at Trader's store		1.3	.0055	.0105	.132	None.	None.	
		1.3	.007	.017	.132	None.	None.	
Fort Wingate, N. Mex:								
Ojo del Oso	58.0	1.0	.002	.005	.076	None.	None.	Total hardness, 31.5°; permanent, 29°. Mineral constituents in grains per gallon: lime, 11.954; magnesia, 2.915; sulphuric acid, 12.529; carbonic acid, 5.240.

FOOD.

The food supply has been reported ample in quantity and of excellent quality. The few exceptional cases in which some article of the supply is made the subject of unfavorable criticism serve merely to emphasize the excellence of this provision for the well being of the soldier. Moreover, it will be seen that most of the references to inferior quality have their origin in the naturally poor condition of western beef cattle at certain seasons. Fort Grant, Ariz., is the only post from which any general complaint was received. Three medical officers were successively in charge during the year, and each felt called upon to invite attention to faults in the food supply. One in July and another in August took exception in strong terms to the butter on hand for sale. Some accidental contamination in storage appears to have been the occasion of these complaints, as the butter is said to have been so strongly flavored with kerosene oil as to be unfit for use. The post commissary of subsistence made suitable recommendation in the case, and as no further unfavorable mention was made it is assumed that the evil was remedied. The quality of the flour was challenged in August, and it was stated that there was a general outcry against the bread. To this the officer on duty as post treasurer replied that a different grade of flour would be received soon, and that the bread had been spoiled in only one instance, and this from careless handling after issue and not from any fault of the baker or defect in the flour. In February the potatoes were represented as so fungus spotted as to involve great waste and consequent shortage in preparing them for the table; in April they were reported as sprouting, and in May as small, shriveled, and of inferior quality. The onions issued in May shared in this adverse criticism.

The chief complaint, however, at this post was against the beef, which was repeatedly reported tough, lean, and with an undue proportion of bone. Similar reports came from other posts in the West, as Whipple Barracks and Forts Bowie, Buford, Clark, and Niobrara, Camp Poplar River, and Forts Ringgold, Stanton, and Supply. The sterile ranges in the vicinity of these posts fail, particularly at certain seasons, to afford the grazing needful to the production of good beef. While characterized as lean, tough and stringy, the meat is usually acknowledged to be as good as is afforded by the neighboring ranges. Beef cattle killed by contractors have ordinarily not dressed more than 350 pounds, and cattle of that size necessarily have a larger proportion of bone than animals in good condition. Contracts provide specifically for good beef, and for procuring it in the open market if the contractor fails to furnish what the contract requires; but the open market usually offers only the same range-fed beef. At Forts Supply and Clark recommendation was made that the contract should provide for stall-fed cattle, at least during certain months of the year, but it is understood that this did not meet with the approval of the Commissary-General of Subsistence. At Whipple Barracks and Fort Niobrara purchases of beef had to be made by the companies to supplement their ration.

The flour issued at Whipple Barracks was reported in April as dark in color and apparently deficient in gluten. At Fort Myer, in the same month, the bread was bad on account of inferior flour. Three samples examined by the post surgeon contained only from 5¾ to 7 per cent of gluten; a fourth sample yielded 12¾ per cent. The flour in the barrels from which the poor samples were taken had a musty odor and sour

taste. Bread made during the following month was of better quality as the use of the defective flour was avoided. Bread of inferior quality at Fort Bayard in September, Fort Thomas in January, and Fort Ringgold in February, was apparently due to faults in baking.

The potatoes issued in September at Fort Clark, and in December and January at Alcatraz Island, were of inferior quality, watery, and decaying. At Forts Stanton and Supply they were soft and shrunken, evidently as a result of frost. The intention of the commanding officer at Fort Columbus, as expressed in the sanitary report for May, to place the potatoes furnished for issue before a board of survey unless there was an immediate improvement in the quality of those furnished by the contractor, appears to have sufficed to secure potatoes, "good and wholesome in quality and condition," in conformity with the terms of the contract.

The post surgeon of St. Francis Barracks represented that in the warm season a ration consisting of 80 per cent Irish potatoes was unsatisfactory and wasteful, as these tubers became waxy or decayed. At the same time an abundance of cheap and wholesome vegetables of local growth was to be found in the markets. In view of these representations, authority was given for the issue at this post, during the period from March 1 to August 31, of 40 per cent of common potatoes, 30 of sweet potatoes, and 30 of other vegetables of wholesome quality procurable in the neighborhood, such as onions, carrots, beets, turnips, cabbages, squashes, and string beans.

The following suggestions by Capt. P. Clendenin, Fort Brady, Mich., are of interest:

> There is a point about the consolidated mess that is very unsatisfactory, and which, it seems to me, should be remedied, and that is the serving of the food. In many instances it is cold before being placed before the men; the distance it is carried is considerable, and by the time the meat, for instance, is carved and distributed, it is cold. This difficulty could be obviated by using a hot carving table such as is frequently seen in city restaurants and hotels. If it is not thought feasible to purchase one, it seems to me one could be made at the post. A table could be made with a top of steam pipes, connected with the steam-heating plant; this would be simply a sort of horizontal radiator. The objection to this would be that it would only be serviceable during the winter months, when steam was on in the building, still steam will no doubt be used during eight months of the year; but, on the other hand, the apparatus should be in working order the year around. I had thought to recommend this scheme, to be supplemented by an arrangement for heating the table by oil or other burning fluid, but all these make odors or are unsafe.
>
> A most practicable scheme has seemed to me to be the use of hot water from the separate heater in the kitchen; the circulation can be kept up by return pipes placed in the same manner that the circulating pipes are arranged between the reservoirs and the bath rooms in the officers' quarters here. If this is not desirable, a table could be constructed with a top which is a closed reservoir of 6 inches depth and the requisite length and width, like an immense oyster can, and let this be filled with water at near the boiling point; this could be filled simply by turning a faucet if the water were piped from the heater, and the water could afterwards be used for dish washing or scrubbing if desired. Whatever scheme is thought best should be arranged before any more men are messed here. There is another suggestion I have to make in this connection, and that is, that rubber-tired wheel carts to carry the food in from the kitchen would be a very great convenience, as with them it would be possible to serve the food much more quickly and in better condition than at present. These carts might be large trays with a tin cover, or might be something similar to the ovens used by caterers in cities; they would not require any means of heating, however, if they were heated before the food was introduced.

CLOTHING.

Medical officers generally appear to be satisfied with the clothing of the men, as unfavorable criticism has been exceedingly rare. Those stationed at Camp Eagle Pass and Key West Barracks desire a lighter quality of woolen underwear for the men. J. Y. Porter, M. D., attend-

ing physician at the latter station, holds that his long professional experience in that climate has demonstrated the necessity for wool as a texture for underwear; but the articles should be of light weight, otherwise they will be uncomfortable and irritating. He considers that "feather-weight" all-wool undershirts and drawers would not be any more expensive of purchase than those now furnished, and would more decidedly conduce to the health and comfort of the men. He thinks it likely that if light woolen articles are not provided the men will purchase for themselves the cheap gauze stuff which does not possess the property of preventing rapid evaporation from the body when bathed with perspiration, and which, consequently, tends to the production of those diseases that arise from chilling of the surface.

On the other hand, the post surgeons at Forts McPherson and Brady take exception to the drawers issued as lacking in the necessary warmth for winter wear. Col. B. J. D. Irwin, Assistant Surgeon-General, characterizes the issue at Fort Brady as unsuitable, inasmuch as it is too light for winter and too rough for summer wear, the drawers and undershirts especially so; and Capt. P. Clendenin protests against the use of cotton drawers at this post. "The underclothing should be of wool and of good quality to protect a man on guard duty when the temperature falls at night to—30° Fahr." It is understood that thick woolen drawers are now supplied to the troops in northern Dakota.

One medical officer compared the weight of the officers' helmet with trimmings (11¾ ounces), with that of the enlisted men (5 ounces), and suggested the use of the latter by everyone as a sanitary measure in hot climates.

A few medical officers have reported that the cloth of the dark blue trousers furnished to the men of the Hospital Corps loses its color, wears white, and soon looks shabby; and one officer criticises in like manner the coats of the men of the companies, stating that they fade on the right breast where the rifle bears in the position of right shoulder arms.

I have already recommended the use of white linen or cotton duck for men of the Hospital Corps on ward, dispensary, and other indoor duties.*

HABITS, CLEANLINESS, ATHLETIC EXERCISES, ETC.

The habits of the men are generally reported good. At some posts, as Fort Grant, reference is made to the evil influence of low resorts bordering on the reservation, where drunkenness and prostitution impair the morals of the men. Similar resorts in cities near military stations do equal harm to the troops. The remarks submitted in presenting the data relating to the prevalence of venereal diseases and alcoholism give a statistical expression to the habits of the men in this view of the question. The bad habits of the Indian companies have already been reported, pages 63 and 103.

With these exceptions the habits of the men must be regarded as good. They are clean in person and clothing and soldierly in bearing. At a few posts the facilities for bathing continue to be somewhat defective, but much has been effected of late in bettering them. The poorest arrangements are probably to be found at Camp Eagle Pass, where the bath house, a hospital tent pitched in an arroya, is furnished with only one tub. Some barrels are arranged to give a shower, and this is

* See page 413.

preferred by the men to the tub. In summer scarcity of water, and in winter the coldness of the weather, prevent regular bathing at this post. Some of the men are therefore wanting in respect to cleanliness of person, and skin diseases are said to have resulted.

The laundry work of the men is usually carried on by the wives of married soldiers living in or near the garrison, or by laundrymen in the neighboring civil communities. At Fort Logan some Chinamen occupy an old wooden building and do the greater part of the washing for the companies. They have a boiler of 40 gallons capacity, a stove, and a few tubs; but the water has to be hauled in barrels and there is no sewer connection, waste water flowing along an open ditch into a neighboring ravine. At Jefferson Barracks laundry work is done by a force of 5 men and 8 women at a steam laundry having an engine of 36-horse power, with tubs, mangles, wringers, etc. This laundry is managed by the depot quartermaster, and its charges fixed by the council of administration of the station. This method of doing the work deserves attention, particularly in view of danger from cholera or specific febrile diseases. Maj. J. Van R. Hoff urged the establishment of a post laundry at Fort Riley to render the post independent of the civilian community of Junction City. He reported in September:

A most intimate connection with the neighboring town and great source of danger arises from the necessity this command labors under of having its laundry work done there. Referring to this in its relation to cases of scarlet fever occurring here, I had the honor to state in my sanitary report for April, 1892, as follows: "These germs (scarlatina) are invited into the garrison chiefly through the instrumentality of the clothing of the command, which is sent to Junction City to be laundered. So long as the necessity for this remains, and it is now a necessity, so long will a gate continue wide open for the entrance of any infectious diseases which may manifest themselves in the neighborhood. There is but one remedy for this condition, the establishment of a laundry at the post." This recommendation gains importance in connection with the approach of cholera, and no steps should be left untaken to carry it out.

Little has been said on the subject of the post exchange during the year, but all the reports concerning it indicate a change of views. Medical opinion, at first generally in favor of the institution as tending to lessen the frequency of intoxication, appears of late to doubt the soundness of its earlier conclusions. Many medical officers now consider that the comparative infrequency of absolute intoxication is offset by the facilities afforded to young men to indulge in beer drinking. They are of opinion that old men habituated to the use of distilled liquors will not be satisfied with beer, but will get whisky at other places than the post exchange, while young men who would not leave their barracks for intoxicants of any kind are led into bad habits by the ease with which beer may be obtained and the official sanction given to its use. In the following paragraphs Maj. C. K. Winne gives excellent expression to this view of the influence of the post exchange as now conducted:

The original idea of the canteen, based upon analogous institutions in some European armies, was an excellent one; that is, to open to men off duty a pleasant, warm, lighted room away from the barracks where they could read, smoke, play cards, or purchase little necessaries or light refreshments, though the latter is not such an essential in this service as it is abroad. There the men have small pay and as a rule an insufficient ration which they are obliged to supplement by purchase. Here, on the contrary, the pay is comparatively large, the ration is ample, and the Subsistence Department now has for sale various extra toilet and other articles, which at one time could only be purchased at the post trader's, while the environment and conditions of the American soldier are in every respect far better than that of any class of men who rely upon manual labor for their subsistence.

But the canteen as originally proposed, and which had much to commend it, has gradually been modified so that it is for all intents and purposes simply an author-

ized beer saloon kept open under the auspices and with the approval of the Government.

The old iniquities of the post-trader's system, with its extortion and intoxication kept under control, have happily passed away, and the question is: Is it desirable to take a retrograde step and continue the intoxication under control in another way? To substitute the quiet narcotism of beer for the active delirium of alcohol is merely to change the action of one poison for another; the use of either one or the other is followed by certain pathological sequences, more rapid and marked in the one case than in the other, but inevitable in both. It is a well-known surgical fact that those men whose bodies to a greater or less extent have undergone the physical degeneration induced by these agents are the most unsatisfactory and uncertain patients; they take anæsthetics badly, recover less rapidly from shock, respond less readily to stimulants when required, while the percentage of those who recover after operations or compound fractures is much less in this class of patients than it is among abstainers.

It seems an anomaly that while on the one hand soldiers are retained in the condition of trained athletes, and their equipments and arms are those which least unfit them from being professional pedestrians, yet on the other hand they are furnished within the post limits with the most fruitful cause of bodily decay, the one thing that will unstring the muscles and befog their brains the soonest and most irretrievably.

While it may not be possible to ascertain accurately whether or not offenses against discipline and courts martial have increased or decreased since the canteen system was established, and on this point there is a wide difference of opinion, yet there can be no doubt as to the fact that the present system, like the old, does encourage, foster, and often initiates the habit of frequent tippling. There is no doubt that many men, particularly the young men, who would either abstain or drink very seldom if to do so they had to leave the post, form the habit of early drinking, and steady all-day drinking, when the opportunities are so freely offered them in immediate proximity to their barracks, with the added association of their comrades. From the canteen the transition is easy to other places outside the limits of the garrison, where stronger drink and other temptations are offered.

Many company commanders will dissent emphatically from the above statement, not only because the canteen profits swell the company funds and are expended in providing the company messes, but also because they consider it better for discipline to control their alcoholics by yielding somewhat to their tastes within the limits of the post; this reasoning, however, it may be submitted, is most fallacious.

The Army ration is considered ample, and with the extra vegetables furnished by the Subsistence Department should supply all the needs of healthy men with good appetites; but if it is insufficient, then the lacking constituents of a good dietary should be supplied by the Government, and not be taken from the pockets of one-half the command in beer money to fill the stomachs of the other half. As these intoxicants are not needed as accessory foods it is neither good morals nor good physiology to permit or encourage their use. If it is desirable to permit the indulgence of or to supervise one vice to a certain extent, then it naturally follows that other vices should be placed in the same category; and there is no logical reason why every post should not be provided with a detachment similar in kind to that famous corps which Brantome describes as accompanying the picked column of the Duke of Alva in his celebrated march to invade the Netherlands: "De plus il y avoit quatre cens courtezanes à cheval, belles et braves comme princesses, et huit cens à pied bien à point aussi."

An idea may be formed of the influence of the post exchange on the messing of the men from the statement that at Columbus Barracks, during the period June 1, 1892, to March 31, 1893, the exchange contributed the sum of $3,005.65 to the mess fund. This was expended chiefly for potatoes, meats, sausages, and dried fruits. The average number of men in the mess was 500.

The following remarks of Dr. J. Y. Porter, on the influence of individual habits on health, although written for the benefit of the garrison of Key West Barracks, are equally applicable to troops at any station:

Having no special comments to make on the sanitary condition of the post and the health of the command (which has been good) for the past month, the thought suggests itself that some recommendations indicating how to keep well, particularly during the hot months, might prove serviceable. Excluding the causes which produce the contagious epidemic diseases, and from which there seems no occasion to fear, owing to the stringent regulations of the State health authorities, the maintenance of health depends mainly upon the ability and inclination of the individual,

and particularly at a military post where the hygiene and sanitary environments are kept as nearly as possible to a required standard. Without that cooperation of the individual the authorities are powerless to prevent the evils which invariably follow the violation of natural laws.

No one can indulge in excesses of any kind—eating, drinking, and abuse of the person—without lowering the vital force, and by vital force is meant that indispensable agency through which life is maintained, and which is begotten through the medium of the stomach and brain. The human animal requires a certain amount of food, drink, and nervous activity to keep him in a normal condition of health; vary that above or below the standard and disease ensues. It therefore seems apparent that individual habits play an important factor in maintaining a healthy life. Thoughtlessness and indifference to the laws of hygiene beget many ailments, which, trivial at the beginning, lay the foundation for graver troubles and chronic diseases. The enlisted man, accustomed to the paternal care of thoughtful authorities in matters of food, clothing, and exercise, is apt to fall into indifferent habits of personal hygiene and to be neglectful in observance of the ordinary means of keeping well. Relieved from the restraint of the garrison, permission to leave the post is too frequently construed into license to indulge freely in alcoholic drinks and in the gratification of the animal passions. While overindulgence in the pleasures of the table is usually followed by indigestion and gastric disturbances, the abuse of alcohol and of the person invariably result in a profound derangement of the nervous centers, making the offender particularly inviting to the inroads of fever and neurotic troubles. Enough has been said it is thought to show that each member of the military family of Key West Barracks is in a great measure responsible to his own personal habits for his health or sickness. The post itself has no inherent causes productive of disease. Fresh air, pure water, and healthy food are supplied, and it is believed in ample quantity to maintain normal health, and it is confidently expected, if each member of the command will give that thoughtful attention to his personal habits by avoiding excesses of eating, drinking, and exposure to the direct rays of the sun and the night air, and by paying due care to the digestive organs, the cessation of the hot season will find the garrison enjoying, as now, good health.

A very general call has been made by medical officers during the year for the fitting up of a room for gymnastic exercises at their posts. The small size of the reservation at some posts and the absence of an open space in the vicinity prevent the men from indulging in base ball or other athletic sports. At St. Francis Barracks, for instance, swimming in the bay is the only exercise available for athletic development other than the usual setting up drill of the soldier. The long-continued rainy season at some stations, as at Fort Canby, interferes with outdoor exercise, and at most of our northern posts the winter is a season of little healthful exercise. The post surgeon of Fort Buford reports of the men that "in winter police duty, shoveling snow, and delivering fuel constitute their principal opportunities for exercise."

The academic gymnasium at West Point is a handsome building completed last year and fitted up with every desirable appliance for gymnastic exercise or physical training, containing also a large and well-lighted natatorium, four bowling alleys, an improved running track, a shooting pit, and a fence hall. Fourth class men only are obliged to attend, but members of the upper classes receive every encouragement to make use of the building, and many do so. The fourth class receives instruction three times a week, from October to June, each lesson forty minutes in duration. On alternate days fencing with foils, sabers, and bayonets is taught, and during summer instruction in swimming is added. Measurements of the cadets are made at the beginning of the course, and from time to time during its progress, to discover the existence of deficiencies, that exercises may be adopted for their correction. The training is based on the German system, with such modifications and additions from other systems as seem advisable, the aim being to develop activity, agility, and grace rather than to turn out expert gymnasts. The results, under the supervision of Mr. H. J. Koender, the master of the sword, have been highly satisfactory.

Plans and estimates, $10,000, for a building at Fort Columbus to be used as a gymnasium, drill room, and lecture hall, 75 by 30 feet, with an 8-foot piazza along its front, hat and wash room, etc., on the first floor, platform and dressing rooms on the second, and furnace for hot air in basement, were forwarded in connection with the sanitary report for March. The department commander considered that such a building would be of great advantage in every way. "The post is so near the city and so limited in area that some attractions are needed, particularly in winter, to keep the men at home and away from evil resorts, as well as to promote physical development and encourage manly exercises." As the Quartermaster's Department had no funds for the construction of gymnasiums the application was disapproved.

At Jefferson Barracks the post surgeon represented the necessity for a riding hall, gymnasium, and general bath house, that athletic exercises might be practiced with system throughout the year. Three and a half hours daily for five days of the week are devoted to these exercises when the weather permits, but the training for cavalry service is often interrupted by meteorological conditions. The present gymnasium is a room on the second floor of the guardhouse, 48 by 28 by 12 feet, furnished with 1 trapeze, 2 horizontal bars, 1 pair of flying rings, 1 ladder, 4 parallel bars, 4 vaulting bucks, 4 chest machines, 24 pairs of clubs, and 36 of dumb bells. Climbing, running, and jumping in the open air are also practiced. A comparison of the physical measurements of men on arrival and at departure is made, but the data gathered are considered insufficient to satisfactorily define the effects.

The gymnasium at the recruiting depot at Columbus Barracks is fully equipped. Each company is drilled one hour daily, except on Saturdays and Sundays. An old barrack building has been converted to use as a gymnasium at the Davids Island Depot; and at several posts, as Forts Bayard, DuChesne, Hancock, Marcy, Mackinac, Camp Pilot Butte, and Vancouver Barracks, vacant squad rooms, mess halls, sheds, etc., have been converted similarly. That at the first-named post is said to be but little used. At Camp Pilot Butte, on the other hand, the men are said to enjoy the exercises; "there are few of the men that are not above the average in strength and activity, and some of them are first class athletes."

Alcatraz Island, Fort Bidwell, Boise Barracks, and Forts Leavenworth, Trumbull, and Washakie are each provided with a gymnasium. At Fort Trumbull a casemate is fitted up; at Washakie a room in the amusement hall building, and at Alcatraz and Boise a hall attached to the post exchange.

RECOMMENDATIONS.

In conclusion I desire to invite attention to the recommendations made in this report, as follows:

The introduction of electric light into the Army and Navy General Hospital, Hot Springs, Ark., and an increase of the accommodations for officers at the hospital. (See page 13.)

White linen or cotton duck as the most suitable wear for men occupied in ward or dispensary duties. (Page 19.)

The reference of all plans for the construction or alteration of buildings or for sanitary improvements at military posts to a board of officers, in which the Medical Department shall be represented. (Page 96.)

The disuse of casemates as living and sleeping rooms. (Page 99.)

A return so far to former methods as to provide public quarters for a limited number of married enlisted men. (Page 100.)

A consideration of the want of equity in the present method of heating the quarters of officers. (Page 101.)

A prohibition of the practice of flushing barrack floors with water for the purpose of cleaning them. (Page 102.)

The construction of crematories for garbage at all permanent posts, particularly when the reservation is small and surrounded by civil communities. (Page 119.)

The establishment of post laundries at large posts to obviate the necessity of sending clothes to various localities in neighboring cities or other civil settlements. (Page 138.)

APPENDED PAPERS.

Appended are certain statistical tables which give in detail the data on which the statements of this report are based. They are:

I. A numerical view of the effects of disease and injury on the Army during the calendar year 1892 as compared with the corresponding data of the year 1891 and of the decade ending December 31, 1890.

II. The relative sickness of the troops (white, colored, and Indian) in the various military departments.

III. The military posts in each department, alphabetically arranged, with mean strength, admissions for disease and injury; also deaths and discharges, with ratios per thousand of strength for admissions and noneffectiveness, the averages of daily sickness, and the meteorological data for the year 1892.

IV. A general view of the results of disease and injury at each of the various military stations, arranged in the order of their mean strength.

V. Twenty posts having the highest rates of admission for the year; the said rates compared with those of 1887–'91, inclusive.

VI. Twenty posts having the highest rates of noneffectiveness during the year; the said rates compared with those of 1887–'91, inclusive.

VII. Twenty posts having the highest admission rates for disease, excluding venereal diseases, vaccina, and alcoholism, together with their ratios for deaths, discharges, and constant noneffectiveness; also the corresponding average rates of the Army.

VIII. Twenty posts having the highest noneffective rates for disease, excluding venereal diseases, vaccina, and alcoholism, together with the average number sick daily, and average duration of each case; also the corresponding average rates of the Army.

IX. The military posts in each department, showing the rates of admission, death, discharge and noneffectiveness for disease, not including venereal diseases, vaccina, nor alcoholism.

X. The monthly prevalence of disease among the white, colored and Indian troops of the Army.

XI. The rates per thousand of strength of admission, death, discharge and noneffectiveness of the Army and of the troops in the several departments for the year, as compared with those of the decade 1881–'90, and of certain foreign armies.

XII. Admission rates for specific febrile diseases in various armies.

XIII. Distribution of specific febrile diseases at United States military posts during the year.

XIV. The distribution of pneumonia at United States military posts during the year.

XV. Twenty posts giving the largest admission rates for malarial diseases, rheumatism, diarrheal and venereal diseases, respectively.

XVI. Twenty posts giving the highest noneffective rates for malarial diseases, rheumatism, diarrheal and venereal diseases, respectively.

XVII. The prevalence of alcoholism at the various posts and its influence on the effective force of the garrison.

XVIII. The relation of certain classes of disease to arms of service and ages of individuals.

XIX. The relation of certain classes of disease to nativities and lengths of service.

XX. The relation of certain specified diseases to arms of service and ages of individuals.

XXI. The relation of certain specified diseases to nativities and lengths of service.

XXII. Number of applicants for enlistment examined during the year, with the number accepted, rejected on primary examination, and declined; also ratios per thousand examined.

XXIII. Causes of rejection among 25,012 recruits examined, with corresponding rates per thousand of each race examined.

XXIV. Nativity of accepted recruits.

XXV. Average height, weight, and chest measurements of accepted recruits.

XXVI. Occupations of accepted recruits.

Respectfully submitted.

GEO. M. STERNBERG,
Surgeon-General.

HON. DANIEL S. LAMONT,
Secretary of War.

APPENDED PAPERS.

STATISTICAL TABLES.

TABLE I.—*A numerical view of the effects of disease and injury on the Army during the calendar year 1892, as compared with the corresponding data for 1891 and for the decade 1881–'90.*

United States Army.	White.	Colored.	Indians.	Total.
Average strength as shown by returns of the Adjutant-General	*23,877	*2,201	*783	*26,861
as shown by reports of the Medical Department	†21,437	†2,036	†730	†24,203
All admissions to sick report during the year	27,299	2,561	888	30,748
treated in hospital	13,664	1,403	348	15,415
treated in quarters	12,938	982	525	14,445
treated in field	697	176	15	888
Ratios of all admissions per 1,000 of mean strength	1,273.45	1,257.86	1,216.44	1,270.42
for the previous year	1,337.70	1,577.03	1,797.30	1,364.78
for the preceding decade	1,442.02	1,625.16	----------	1,459.65
Admissions for disease	22,011	1,967	653	24,631
ratios per 1,000 of mean strength	1,026.78	966.11	894.52	1,017.68
for the previous year	1,096.23	1,266.47	1,452.70	1,115.86
for the preceding decade	1,201.83	1,333.36	----------	1,214.49
Admissions for injury	5,288	594	235	6,117
ratios per 1,000 of mean strength	246.68	291.75	321.92	252.74
for the previous year	241.47	310.56	344.59	248.91
for the preceding decade	240.19	291.80	----------	245.16
Ratios per 1,000 of mean strength of cases treated in hospital	637.41	689.10	476.70	636.86
of cases treated in quarters	603.54	482.32	719.18	596.83
of cases treated in field	32.51	86.45	20.55	36.69
Number constantly noneffective during the year	850.84	78.49	29.17	958.51
ratios per 1,000 of mean strength	39.69	38.55	39.97	39.60
ratios for the previous year	41.65	44.12	52.36	42.01
ratios for the preceding decade	43.31	44.35	----------	43.41
Number of days lost on account of sickness during the year	311,409	28,728	10,678	350,815
average for each man of the Army	14.5	14.1	14.6	14.5
for the previous year	15.2	16.1	19.1	15.3
for the preceding decade	15.8	16.2	----------	15.9
Average number of days each case was treated	11.4	11.2	12.0	11.4
for the previous year	11.4	10.2	10.6	11.2
for the preceding decade	11.0	10.0	----------	10.9
Average days treatment for patients discharged for disability	87.9	90.8	64.6	86.8
who died	31.8	44.8	33.6	32.9
Number of discharges for disability	436	32	25	493
ratios per 1,000 of mean strength	18.26	14.54	31.93	18.35
for the previous year	17.24	19.10	3.19	17.23
for the preceding decade	30.62	31.37	----------	30.70
Number of discharges for disease	383	30	22	435
ratios per 1,000 of mean strength	16.04	13.63	28.09	16.20
for the previous year	14.23	18.66	3.19	14.47
for the preceding decade	27.23	26.87	----------	27.20
Number of discharges for injury	53	2	3	58
ratios per 1,000 of mean strength	2.22	.91	3.83	2.16
for the previous year	3.01	.44	----------	2.76
for the preceding decade	3.39	4.50	----------	3.50
Number of deaths from all causes	146	11	16	173
ratios per 1,000 of mean strength	6.11	5.00	20.43	6.44
for the previous year	5.16	7.11	6.39	8.05
for the preceding decade	8.57	10.42	----------	8.75

* Used in computing the ratios of deaths and discharges for the whole Army.
† Used in computing all ratios for the Army except those of deaths and discharges

TABLE I.—*A numerical view of the effects of disease and injury on the Army during the calendar year 1892, etc.*—Continued.

United States Army.	White.	Colored.	Indians.	Total.
Number of deaths from disease	101	7	9	117
ratios per 1,000 of mean strength	4.23	3.18	11.49	4.36
for the previous year.	4.98	5.78	3.19	5.03
for the preceding decade	5.66	7.26	.....	5.81
Number of deaths from injury	45	4	7	56
ratios per 1,000 of mean strength	1.88	1.82	8.94	2.08
for the previous year.	3.18	1.33	3.19	3.02
for the preceding decade	2.91	3.16	.....	2.93

TABLE II.—*The relative sickness among the troops, white, colored and Indian, in the various military departments during the year 1892.*

Army, by departments.		Mean strength of command.	Admissions. Quarters.	Hospital.	Field.	Disease.	Injury.	Total.	Admission rate per 1,000 of mean strength.	Troops per 1,000 of mean strength constantly noneffective from sickness.
East	W	6,399	4,952	4,706	43	8,181	1,520	9,701	1,516.02	42.42
	C	149	84	152	.....	193	43	236	1,583.89	47.62
	I	65	36	49	.....	55	30	85	1,307.69	45.44
	T	6,613	5,072	4,907	43	8,429	1,593	10,022	1,515.50	42.56
Missouri	W	3,982	2,465	2,481	48	4,027	967	4,994	1,254.14	35.63
	C	136	29	130	.....	117	42	159	1,169.12	41.81
	I	60	64	10	.....	65	9	74	1,083.33	35.98
	T	4,178	2,558	2,621	48	4,209	1,018	5,227	1,251.08	35.84
Dakota	W	2,340	1,739	1,191	65	2,325	670	2,995	1,279.91	40.24
	C	698	418	451	5	674	200	874	1,252.15	36.06
	I	195	170	89	.....	185	74	259	1,328.20	56.14
	T	3,233	2,327	1,731	70	3,184	944	4,128	1,276.83	40.29
Platte	W	2,919	1,154	1,673	213	2,360	680	3,040	1,041.45	31.92
	C	429	116	305	133	401	153	554	1,291.38	28.77
	I	223	122	127	11	214	46	260	1,165.92	35.02
	T	3,571	1,392	2,105	357	2,975	879	3,854	1,079.25	31.74
Texas	W	1,477	751	1,293	116	1,739	421	2,160	1,462.42	54.38
	C	4	.....	3	.....	3	.....	3	750.00	8.88
	T	1,481	751	1,296	116	1,742	421	2,163	1,460.51	54.25
Arizona	W	1,651	1,085	972	75	1,681	451	2,132	1,291.34	42.54
	C	617	335	361	38	578	156	734	1,189.63	42.58
	I	162	121	50	4	112	63	175	1,080.25	27.44
	T	2,430	1,541	1,383	117	2,371	670	3,041	1,251.44	41.55
California	W	1,300	404	756	79	919	320	1,239	953.07	32.16
	T	1,300	404	756	79	919	320	1,239	953.07	32.16
Columbia	W	1,339	388	573	58	760	259	1,019	761.02	27.75
	I	25	12	23	.....	22	13	35	1,400.00	34.75
	T	1,364	400	596	58	782	272	1,054	772.73	27.88
Hot Springs, Ark.	W	30	.....	19	.....	19	.....	19	.....	.....
	C	3	.....	1	.....	1	.....	1	.....	.....
	T	33	.....	20	.....	20	.....	20	.....	.....
At large: Miscellaneous deaths and discharges.	W	.....	.....	.....	.....	.....	.....	.....	.....	.....
	T	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total for the Army.	W	21,437	12,938	13,664	697	22,011	5,288	27,299	1,273.45	39.69
	C	2,036	982	1,403	176	1,967	594	2,561	1,257.86	38.55
	I	730	525	348	15	653	235	888	1,216.44	39.97
	T	24,203	14,445	15,415	888	24,631	6,117	30,748	1,270.42	39.60

TABLE II.—*The relative sickness among the troops, white, colored and Indian, in the various military departments during the year 1892*—Continued.

Army, by departments.		Deaths.	Annual death rate per 1,000 of mean strength.	Discharged for disability.	Annual discharge rate per 1,000 of mean strength.	Average duration of treatment among patients.		Death rate per 1,000 of admissions.	Discharge rate per 1,000 of admissions.	Recoveries per 1,000 of admissions.	Average sick daily.	Average duration of treatment among all admissions.
						Who died.	Who were discharged for disability.					
East	W	48	7.50	116	18.13	21.8	73.2	4.95	11.96	971.24	271.39	10.24
	C	1	6.71	5	33.56	.....	45.2	4.24	21.19	966.10	7.10	11.00
	I	5	76.92	.....	.....	41.0	.....	58.83	.....	953.00	2.95	12.72
	T	54	8.17	121	18.30	23.6	72.2	5.39	12.07	972.10	281.44	10.28
Missouri	W	23	5.78	62	15.75	23.8	79.9	4.61	12.41	972.17	141.90	10.40
	C	.....	.....	.....	.....	.....	.....	.....	.....	949.69	5.69	13.09
	I	1	16.67	3	50.00	57.0	70.3	13.51	40.54	891.89	2.16	10.67
	T	24	5.74	65	15.56	26.6	79.4	4.59	12.43	970.34	149.75	10.48
Dakota	W	14	5.98	43	18.37	26.2	81.0	4.67	14.36	969.62	94.16	11.51
	C	3	4.30	11	15.76	47.3	81.1	3.43	12.59	980.55	25.17	10.54
	I	1	5.13	11	56.41	77.0	57.5	3.86	42.47	969.11	10.94	15.46
	T	18	5.57	65	20.10	34.3	76.8	4.36	15.74	971.90	130.27	11.55
Platte	W	14	4.80	31	10.62	68.7	119.9	4.61	10.12	972.70	93.16	11.22
	C	4	9.32	2	4.66	17.0	48.0	7.22	3.61	994.58	12.34	8.15
	I	4	17.94	11	49.33	2.0	70.8	15.38	42.31	926.92	7.81	10.99
	T	22	6.16	44	12.32	50.2	105.8	5.71	11.42	972.76	113.32	10.76
Texas	W	17	11.51	41	27.76	60.9	73.1	7.87	18.98	946.30	80.32	13.61
	C	.....	.....	.....	.....	.....	.....	.....	.....	666.67	.04	4.33
	T	17	11.48	41	27.68	60.9	73.1	7.86	18.96	945.91	80.35	13.60
Arizona	W	12	7.27	41	24.83	12.9	66.2	5.63	19.23	950.28	70.24	12.06
	C	3	4.86	12	19.45	70.0	88.7	4.13	16.35	989.10	26.27	13.10
	I	5	30.86	.....	.....	12.0	.....	28.57	.....	948.57	4.45	9.30
	T	20	8.23	53	21.81	23.4	72.1	6.58	17.43	959.55	100.95	12.15
California	W	5	3.85	21	16.15	5.7	51.4	4.04	16.95	954.00	40.23	11.88
	T	5	3.85	21	16.15	5.7	51.4	4.04	16.95	954.00	40.23	11.88
Columbia	W	5	3.73	25	18.67	11.3	128.4	4.91	24.53	963.69	37.16	13.35
	I	.....	.....	.....	.....	.....	.....	.....	.....	885.70	.87	9.09
	T	5	3.67	25	18.33	11.3	128.4	4.74	23.72	966.79	38.03	13.20
Hot Springs, Ark	W	1	.....	21	.....	219.0	203.8	.....	.....	.....	.....	.....
	C	.....	.....	2	.....	.....	264.5	.....	.....	.....	.....	.....
	T	1	.....	23	.....	219.0	209.0	.....	.....	.....	.....	.....
At large: Miscellaneous deaths and discharges.	W	7	.....	35	.....	25.5	.....	.....	.....	.....	.....	.....
	T	7	.....	35	.....	25.5	.....	.....	.....	.....	.....	.....
Total for the Army.	W	146	6.11	436	18.26	31.8	87.9	5.35	15.97	967.51	850.84	11.41
	C	11	5.00	32	14.54	44.8	90.8	4.30	12.49	989.07	78.48	11.22
	I	16	20.43	25	31.93	33.6	64.6	18.02	28.15	948.20	29.18	12.02
	T	173	6.44	493	18.35	32.9	86.8	5.63	16.03	968.74	958.51	11.41

TABLE III.—*Military posts in each department, alphabetically arranged, with mean strength, admissions for disease and injury, also deaths and discharges, with ratios per thousand of strength for admissions, and noneffectiveness, the averages of daily sickness, and meteorological data for 1892.*

DEPARTMENT OF THE EAST.

Names of stations.	Mean strength.	Cases.			Admission rate per 1,000 of mean strength.	Average number of sick daily.	Constantly noneffective per 1,000 of mean strength.	Discharges for disability.	Deaths.	Altitude of stations.	Temperature.			Total precipitation.
		Disease.	Injury.	Total.							Mean.	Maximum.	Minimum.	
										Feet.				*In*
Fort Adams, R. I	248	207	73	280	1,129.03	8.09	32.62	2	3	30	49.3	93	— 1	43.95
Allegheny Arsenal, Pa	32	36	7	43	1,343.75	1.79	56.01	1	1	704	52.1	96	2	32.66
Augusta Arsenal, Ga	27	10	.....	10	370.37	.46	17.20	.....	1	600	63.0	97	23	39.27
Fort Barrancas, Fla	75	122	27	149	1,986.67	5.30	70.64	2	.....	30	67.0	94	28	44.02
Columbia Arsenal, Tenn	19	47	3	50	2,631.58	1.62	85.42	.....	1	.....	.....	.....	.....	.....
Columbus Barracks, Ohio	591	1,103	114	1,217	2,059.23	42.54	71.98	8	7	740	51.3	97	— 5	33.54
Fort Columbus, N. Y	244	170	29	199	815.57	9.35	38.31	3	1	25	.....	.....	.....	.....
Davids Island, N. Y	555	975	199	1,174	2,115.32	25.71	46.31	6	2	30	.....	.....	.....	.....
Frankford Arsenal, Pa	40	27	1	28	700.00	1.30	32.51	.....	2	50	53.5	101	10	34.78
Fort Hamilton, N. Y	262	521	96	617	2,354.96	12.57	48.04	5	1	47	.....	.....	.....	.....
Jackson Barracks, La	106	154	21	175	1,650.94	6.10	57.51	8	1	10	68.1	93	23	56.91
Kennebec Arsenal, Me	15	20	3	23	1,533.33	.32	21.13	.....	.....	200	43.7	93	—13	33.53
Madison Barracks, N. Y	333	296	73	369	1,108.10	11.46	34.40	9	4	262	.....	.....	—31	40.71
Fort McHenry, Md	160	173	36	209	1,306.25	8.05	50.33	8	1	36	54.1	99	12	45.05
Fort McPherson, Ga	399	571	81	652	1,634.09	23.16	58.04	7	3	1,078	59.6	94	13	46.87
Fort Monroe, Va	375	595	79	674	1,797.33	17.02	45.38	7	1	8	58.4	99	19	49.24
Mount Vernon Barracks, Ala	181	267	62	329	1,817.68	9.02	49.81	6	8	155	.....	.....	.....	.....
Fort Myer, Va	236	278	104	382	1,618.64	9.57	40.55	6	3	200	54.1	97	4	46.10
Newport Barracks, Ky	60	60	12	72	1,200.00	2.02	33.70	.....	1	588	53.3	98	2	31.95
Fort Niagara, N. Y	188	102	24	126	670.21	5.52	29.37	3	1	271	48.4	94	— 2	.....
Fort Ontario, N. Y	61	49	10	59	967.21	2.03	33.33	2	1	282	.....	.....	.....	.....
Plattsburg Barracks, N. Y	61	60	13	73	1,196.72	1.56	25.62	.....	.....	186	42.7	98	—14	40.16
Fort Porter, N. Y	105	100	19	119	1,133.33	3.77	35.91	1	.....	600	46.3	88	— 2	45.87
Fort Preble, Me	57	55	15	70	1,228.07	2.85	49.94	3	.....	38	45.1	95	— 5	39.15
St. Francis Barracks, Fla	123	209	33	242	1,967.48	5.61	45.60	8	1	15	68.2	94	29	39.93
Sandy Hook, N. J	52	87	11	98	1,884.62	.99	19.13	1	.....	.....	.....	.....	.....	.....
Fort Schuyler, N. Y	98	95	28	123	1,255.10	3.30	33.68	1	3	25	.....	.....	.....	.....
Springfield Armory, Mass	24	8	3	12	500.00	.39	16.05	.....	.....	250	48.5	95	— 2	45.29
Fort Thomas, Ky	268	246	55	301	1,123.13	11.31	42.19	9	.....	.....	.....	.....	.....	.....
Fort Trumbull, Conn	62	56	9	65	1,048.39	2.30	36.93	1	.....	25	48.8	92	— 2	34.75
Fort Wadsworth, N. Y	175	152	42	194	1,108.57	3.59	20.50	.....	1	140	.....	.....	.....	.....
Fort Warren, Mass	115	56	14	70	608.70	2.55	22.14	2	.....	38	49.4	96	0	37.02
Washington Barracks, D. C	332	595	63	658	1,981.93	14.35	43.22	4	1	106	54.0	99	4	42.34
Watertown Arsenal, Mass	31	28	.....	28	903.23	.52	16.75	.....	.....	100	.....	.....	.....	.....
Watervliet Arsenal, N. Y	55	70	11	81	1,472.73	3.35	60.96	1	.....	50	.....	.....	.....	.....
West Point, N. Y	375	415	119	534	1,424.00	9.60	25.59	4	2	167	.....	99	— 2	42.21
Willets Point, N. Y	376	353	84	437	1,162.23	11.78	31.33	3	2	80	51.2	98	5	39.65
Fort Wood, N. Y	54	28	9	37	685.19	.25	4.55	.....	1	.....	.....	.....	.....	.....
Field	43	32	11	43	1,000.00	.39	9.15	.....	.....	.....	.....	.....	.....	.....
Total	6,613	8,429	1,593	10,022	1,515.50	281.44	42.56	121	54	.....	.....	.....	.....	.....

DEPARTMENT OF THE MISSOURI.

Fort Brady, Mich	117	87	21	108	923.08	3.35	28.60	3	1	600	39.1	90	—22	30.90
Chicago, Ill	52	9	1	10	192.31	.45	8.72	.....	.....	661	46.6	94	—10	36.56
Indianapolis Arsenal, Ind	25	37	5	42	1,680.00	.87	34.97	.....	.....	698	52.0	97	— 5	39.79
Jefferson Barracks, Mo	506	369	74	443	875.49	16.36	32.34	2	.....	475	55.0	97	— 2	41.69
Fort Leavenworth, Kans	716	549	192	741	1,034.92	24.40	34.07	7	2	844	52.5	98	—20	40.02
Leavenworth Prison, Kans	115	91	6	97	843.47	3.00	26.11	2	2	844	52.5	98	—20	40.09
Fort Mackinac, Mich	114	71	13	84	736.84	1.77	15.48	.....	.....	728	40.6	94	—10	27.27
Camp Oklahoma, Okla	39	54	10	64	1,641.02	1.69	43.22	.....	.....	.....	58.0	98	—11	42.28
Fort Reno, Okla	316	505	101	606	1,917.72	21.35	67.57	9	5	3,200	.....	.....	.....	.....
Fort Riley, Kans	686	577	218	795	1,158.89	19.17	27.95	10	21	1,300	53.3	104	—25	38.04
Rock Island Arsenal, Ill	65	74	10	84	1,292.31	1.40	21.48	.....	.....	528	48.0	94	—12	44.15
Fort Sheridan, Ill	527	596	147	743	1,409.87	18.09	34.32	9	5	.....	.....	94	— 8	32.68
Fort Sill, Okla	346	482	90	572	1,653.18	12.89	37.26	10	5	1,200	59.2	104	— 6	34.32
Fort Supply, Ind. T	267	407	74	481	1,801.50	12.55	47.01	7	.....	2,300	55.9	104	—13	21.95
Fort Wayne, Mich	233	271	38	309	1,326.18	11.83	50.78	6	2	580	47.6	96	— 8	37.11
Field	54	30	18	48	888.89	.58	10.73	.....	.....	.....	.....	.....	.....	.....
Total	4,178	4,209	1,018	5,227	1,251.08	149.73	35.84	65	24	.....	.....	.....	.....	.....

TABLE III.—*Military posts in each department, alphabetically arranged, with mean strength, admissions for disease and injury, etc.*—Continued.

DEPARTMENT OF DAKOTA.

Names of stations.	Mean strength.	Cases.			Admission rate per 1,000 of mean strength.	Average number of sick daily.	Constantly noneffective per 1,000 of mean strength.	Discharges for disability.	Deaths.	Altitude of stations.	Temperature.			Total precipitation.
		Disease.	Injury.	Total.							Mean.	Maximum.	Minimum.	
										Feet.				*In.*
Fort Assinniboine, Mont	459	432	86	518	1,128.54	18.65	40.64	11	2	2,720	41.0	98	—31	12.40
Fort Buford, N. Dak	213	192	68	260	1,220.66	6.08	28.55	3	2	1,930	39.5	100	—40	14.26
Fort Custer, Mont	395	490	116	606	1,534.18	20.20	51.14	6	1	3,040				
Fort Keogh, Mont	386	380	108	488	1,264.25	14.46	37.46	5	5	2,536	43.2	108	—28	12.64
Fort Meade, S. Dak	413	442	201	643	1,556.90	18.55	44.91	17	1	3,624	45.0	102	—29	24.09
Fort Missoula, Mont	189	92	22	114	603.17	3.90	20.64	6		3,375	42.9	100	—15	13.13
Fort Pembina, N. Dak	39	16	1	17	435.90	.51	13.03			900				
Camp Poplar River, Mont	97	90	26	116	1,195.88	2.58	26.62	3		2,030	39.0	104	—42	13.30
Fort Snelling, Minn	412	437	120	557	1,351.94	17.95	43.56	4	4	840	42.8	90	—25	32.55
Fort Sully, S. Dak	176	192	57	249	1,414.77	7.04	39.99	2		1,678	45.1	106	—30	18.81
Fort Yates, N. Dak	259	315	91	406	1,567.57	16.83	64.98	8	3	1,670	42.1	102	—31	21.20
Fort Yellowstone, Wyo	76	57	27	84	1,105.26	1.80	23.62				38.3	91	—22	19.07
Field	119	49	21	70	588.24	1.73	14.51							
Total	3,233	3,184	944	4,128	1,276.83	130.27	40.29	65	18					

DEPARTMENT OF THE PLATTE.

Fort D. A. Russell, Wyo	429	242	87	329	766.90	13.55	31.59	6	3	6,021	44.5	93	—29	13.50
Fort Douglas, Utah	485	421	71	492	1,014.43	16.19	33.39	6	1	4,904	51.2	100	— 1	14.08
Fort Du Chesne, Utah	139	105	61	166	1,194.24	4.47	32.14	1				100	—17	5.46
Fort Logan, Colo	332	267	69	336	1,012.05	11.49	34.60	3	2		48.9	98	—17	15.02
Fort McKinney, Wyo	270	272	84	356	1,318.52	12.25	45.36	3	1	5,175	45.3	99	—24	12.35
Fort Niobrara, Nebr	336	293	97	390	1,160.72	13.27	39.50	4	2	2,750	45.9	104	—24	27.92
Fort Omaha, Nebr	483	490	101	591	1,223.60	16.17	33.49	18	3	960	49.2	100	—26	29.44
Camp Pilot Butte, Wyo	48	34	6	40	833.33	1.50	31.25				41.5	95	—27	
Fort Randall, S. Dak	97	76	36	112	1,154.64	2.09	21.57		3	1,245	46.2	102	—22	20.98
Fort Robinson, Nebr	349	318	126	444	1,272.21	9.77	27.99	2	3	3,675		98	—28	32.34
Fort Sidney, Nebr	134	104	32	136	1,014.93	3.62	26.99	1		4,320	46.6	103	—29	19.89
Fort Washakie, Wyo	155	72	33	105	677.42	3.14	20.27		2	5,462	43.0	94	—30	12.23
Field	314	281	76	357	1,136.94	5.80	18.48		2					
Total	3,571	2,975	879	3,854	1,079.25	113.33	31.74	44	22					

DEPARTMENT OF TEXAS.

Fort Bliss, Tex	107	76	12	88	822.43	2.70	25.25	1	2	3,600	63.2	105	13	5.32
Fort Brown, Tex	59	27	7	34	576.27	2.18	36.91	4	2	50				
Fort Clark, Tex	321	411	83	494	1,538.94	19.51	60.77	8	3	1,000	68.4	103	11	13.99
Camp at Eagle Pass, Tex	53	97	15	112	2,113.21	4.04	76.30	3		800	70.2	107	11	22.97
Fort Hancock, Tex	50	52	41	93	1,860.00	2.23	44.65	1		3,000	59.9	111	—1	6.96
Fort McIntosh, Tex	149	184	31	215	1,442.95	10.27	68.91	2	2	380	72.0	105	21	21.05
Camp Pena Colorado, Tex	49	41	10	51	1,040.82	2.61	53.19	1	1	3,800	61.1	101	1	12.08
Fort Ringgold, Tex	134	175	55	230	1,716.42	9.40	70.14	5	1	521	73.7	109	16	19.25
Fort Sam Houston, Tex	427	582	137	719	1,683.84	25.16	58.93	16	5	781	69.3	98	19	25.81
San Antonio, Tex	34	10	1	11	323.52	.66	19.44		1	781	69.3	98	19	25.81
Field	98	87	29	116	1,183.67	1.59	16.25							
Total	1,481	1,742	421	2,163	1,460.51	80.35	54.25	41	17					

DEPARTMENT OF ARIZONA.

Fort Apache, Ariz	197	220	45	265	1,345.18	7.73	39.22	2	2	5,050	53.3	103	5	12.70
Fort Bayard, N. Mex	298	338	64	402	1,348.99	17.65	59.22	6	3	6,040	55.2	102	8	8.80
Fort Bowie, Ariz	136	116	53	169	1,242.65	6.11	44.91		2	4,826	61.5	104	18	13.17
Fort Grant, Ariz	286	302	105	407	1,423.08	13.61	47.61	14	4	4,856	62.2	105	19	7.90
Fort Huachuca, Ariz	318	220	66	286	899.37	7.80	24.54	2	3	5,173	60.2	100	9	11.50
Fort Marcy, N. Mex	123	194	38	232	1,886.18	6.95	56.53	4		6,846	49.1	90	1	11.62
San Carlos, Ariz	167	186	42	228	1,365.27	7.22	43.21	5		2,156	64.3	112	16	12.05
San Diego, Cal	69	55	10	65	942.03	5.44	78.88	7		150	60.2	87	36	9.09
Fort Stanton, N. Mex	112	113	27	140	1,250.00	4.85	43.28	2		7,500	51.4	94	5	11.34
Fort Thomas, Ariz	20	8	4	12	600.00	.88	44.12	1		2,710				
Whipple Barracks, Ariz	192	173	45	218	1,135.42	7.98	41.54	8	2	5,340	59.9	101	0	12.90
Fort Wingate, N. Mex	358	370	130	500	1,396.65	12.93	36.12	2	3	6,649	50.5	99	—2	8.72
Field	154	76	41	117	759.74	1.81	11.74		1					
Total	2,430	2,371	670	3,041	1,251.44	100.95	41.55	53	20					

TABLE III.—*Military posts in each department, alphabetically arranged, with mean strength, admissions for disease and injury, etc.*—Continued.

DEPARTMENT OF CALIFORNIA.

Names of stations.	Mean strength.	Cases.			Admission rate per 1,000 of mean strength.	Average number of sick daily.	Constantly noneffective per 1,000 of mean strength.	Discharges for disability.	Deaths.	Altitude of stations.	Temperature.			Total precipitation.
		Disease.	Injury.	Total.							Mean.	Maximum.	Minimum.	
										Feet.				*In.*
Alcatraz Island, Cal	117	94	26	120	1,025.64	4.72	40.35	2	....	136	....	....	....	.....
Angel Island, Cal	276	219	46	265	960.14	10.11	36.63	13	....	.....	.....	.....	.....	.....
Benicia Arsenal, Cal	53	23	11	34	641.51	.86	16.13	....	1	64	58.1	94	32	24.41
Benicia Barracks, Cal	132	89	20	109	825.76	2.80	21.24	1	3	64	....	....	....	.....
Fort Bidwell, Cal	57	52	28	80	1,403.51	1.90	33.41	2	....	4,680	48.1	95	7	16.11
Fort Gaston, Cal	32	24	7	31	968.75	.56	17.50	....	....	397	....	....	....	.....
Fort Mason, Cal	58	26	14	40	689.66	1.26	21.72	1	....	113	....	....	....	.....
Presidio of San Francisco, Cal	465	345	136	481	1,034.41	16.50	35.48	2	....	60	55.8	92	38	22.08
Field	110	47	32	79	718.18	1.52	13.84	....	1	.....	....	....	....	.....
Total	1,300	919	320	1,239	953.07	40.23	32.16	21	5	.....	....	....	....	.....

DEPARTMENT OF THE COLUMBIA.

Boise Barracks, Idaho	98	51	17	68	693.88	2.22	22.64	2	....	2,830	49.3	109	1	11.75
Fort Canby, Wash	106	114	23	137	1,292.45	5.81	54.85	7	....	179	50.6	78	29	62.92
Fort Sherman, Idaho	232	103	45	148	637.93	5.97	25.73	2	1	198	....	....	—16	27.01
Fort Spokane, Wash	135	46	24	70	518.52	3.41	25.26	2	1	1,600	47.9	104	— 6	17.72
Fort Townsend, Wash	64	30	11	41	640.62	.87	13.66	1	....	135	49.0	85	18	23.50
Vancouver Barracks, Wash	407	222	74	296	727.27	11.44	28.10	10	1	50	52.9	94	20	33.58
Fort Walla Walla, Wash.	204	178	58	236	1,156.86	7.66	37.54	1	1	1,018	53.8	105	2	16.94
Field	118	38	20	58	491.53	.64	5.46	....	1	.....	....	....	....	.....
Total	1,364	782	272	1,054	772.73	38.03	27.88	25	5	.....	....	....	....	.....

TABLE IV.—*A general view of the results of disease and injury at each of the military stations, arranged in the order of their mean strength.*

GROUP 1.—Fifteen stations, garrisoned by 400 to 700 men each. Average, 504.

Military stations.	Mean strength.	Admission rate per 1,000 of mean strength.	Constantly noneffective.			Deaths.		Discharges.	
			Daily average in hospital.	Ratios per 1,000 of mean strength of—		No.	Ratio per 1,000 of mean strength	No.	Ratio per 1,000 of mean strength
				Cases in hospital.	All cases.				
Fort Leavenworth, Kans	716	1,034.92	16.72	23.4	34.07	2	2.79	7	9.78
Fort Riley, Kans	686	1,158.89	8.41	12.3	27.95	2	2.92	10	14.58
Columbus Barracks, Ohio	591	2,059.23	37.07	62.6	71.98	7	11.84	8	13.54
Davids Island, N. Y	555	2,115.32	13.83	24.9	46.31	2	3.60	6	10.81
Fort Sheridan, Ill	527	1,409.87	13.02	24.7	34.32	5	9.49	9	17.08
Jefferson Barracks, Mo	506	875.49	16.16	31.9	32.34	....	.....	2	3.95
Fort Douglas, Utah	485	1,014.43	11.42	23.5	33.39	1	2.06	6	12.37
Fort Omaha, Nebr	483	1,223.60	11.25	23.3	33.49	3	6.21	18	37.27
Presidio of San Francisco, Cal	465	1,034.41	13.19	28.4	35.48	....	.....	2	4.30
Fort Assiniboine, Mont	459	1,128.54	13.83	30.1	40.64	2	4.36	11	23.97
Fort D. A. Russell, Wyo	429	766.90	11.12	25.9	31.59	3	6.99	6	13.99
Fort Sam Houston, Tex	427	1,683.84	19.62	45.9	58.93	5	11.71	16	37.47
Fort Meade, S. Dak	413	1,556.90	13.03	31.5	44.91	1	2.42	17	41.16
Fort Snelling, Minn	412	1,351.94	8.99	21.8	43.56	4	9.71	4	9.71
Vancouver Barracks, Wash	407	727.27	7.75	19.0	28.10	1	2.46	10	24.57
Summary	7,561	1,288.06	215.45	28.5	39.73	38	5.03	132	17.46

TABLE IV.—*A general view of the results of disease and injury at each of the military stations, arranged in the order of their mean strength*—Continued.

GROUP 2.—Sixteen stations, garrisoned by 300 to 400 men each. Average, 353.

Military stations.	Mean strength.	Admission rate per 1,000 of mean strength.	Constantly noneffective.			Deaths.		Discharges.	
			Daily average in hospital.	Ratios per 1,000 of mean strength, of—		No.	Ratios per 1,000 of mean strength	No.	Ratios per 1,000 of mean strength
				Cases in hospital.	All cases.				
Fort McPherson, Ga	399	1,634.09	12.10	30.1	58.04	3	7.52	7	17.54
Fort Custer, Mont	395	1,534.18	8.63	21.8	51.14	1	2.53	6	15.19
Fort Keogh, Mont	386	1,264.25	8.08	20.9	37.46	5	12.95	5	12.95
Willets Point, N. Y	376	1,162.23	7.91	21.0	31.33	2	5.32	3	7.98
Fort Monroe, Va	375	1,797.33	11.11	29.6	45.38	1	2.67	7	18.67
West Point (soldiers), N. Y	375	1,424.00	3.90	10.4	25.59	2	5.33	4	10.67
Fort Wingate, N. Mex	358	1,396.65	6.22	17.4	36.12	3	8.38	2	5.59
Fort Robinson, Nebr	349	1,272.21	6.77	19.4	27.99	3	8.60	2	5.73
Fort Sill, Okla	346	1,653.18	6.04	17.5	37.26	5	14.45	10	28.90
Fort Niobrara, Nebr	336	1,160.72	10.15	30.2	39.50	2	5.95	4	11.90
Madison Barracks, N. Y	333	1,108.10	6.46	19.4	34.40	4	12.01	9	27.03
Fort Logan, Colo	332	1,012.05	8.83	26.6	34.60	2	6.02	3	9.04
Washington Barracks, D. C	332	1,981.93	11.58	34.9	43.22	1	3.01	4	12.05
Fort Clark, Tex	321	1,538.94	14.61	45.5	60.77	3	9.35	8	24.92
Fort Huachuca, Ariz	318	899.37	5.10	16.0	24.54	3	9.43	2	6.29
Fort Reno, Okla	316	1,917.72	16.58	52.5	67.57	5	15.82	9	28.48
Summary	5,647	1,424.83	144.08	25.5	40.91	45	7.97	85	15.05

GROUP 3.—Fifteen stations, garrisoned by 200 to 300 men each. Average, 253.

Fort Bayard, N. Mex	298	1,348.90	11.52	38.7	59.22	3	10.07	6	20.13
Fort Grant, Ariz	286	1,423.08	7.47	26.1	47.61	4	13.99	14	48.95
Angel Island, Cal	276	960.14	8.62	31.2	36.63	....	....	13	47.10
Fort McKinney, Wyo	270	1,318.52	9.13	33.7	45.36	1	3.70	3	11.11
Fort Thomas, Ky	268	1,123.13	9.46	35.3	42.19	....	....	9	33.58
Fort Supply, Ind. T	267	1,801.50	8.18	30.6	47.01	....	....	7	26.22
Fort Hamilton, N. Y	262	2,354.96	3.15	12.0	48.04	1	3.82	5	19.08
Fort Yates, N. Dak	259	1,567.57	10.74	41.5	64.98	3	11.58	8	30.89
Fort Adams, R. I	248	1,129.03	5.13	20.7	32.62	3	12.10	2	8.06
Fort Columbus, N. Y	244	815.57	8.29	34.0	38.31	1	4.10	3	12.29
Fort Myer, Va	236	1,618.64	8.17	34.6	40.55	3	12.71	6	25.42
Fort Wayne, Mich	233	1,326.18	5.80	24.9	50.78	2	8.58	6	25.75
Fort Sherman, Idaho	232	637.93	4.12	17.8	25.73	1	4.31	2	8.62
Fort Buford, N. Dak	213	1,220.66	5.05	23.7	28.55	2	9.39	3	14.08
Fort Walla Walla, Wash	204	1,156.86	5.73	28.1	37.54	1	4.90	1	4.90
Summary	3,796	1,330.08	110.55	29.1	43.58	25	6.59	88	23.18

GROUP 4.—Twenty-nine stations, garrisoned by 100 to 200 men each. Average, 141.

Fort Apache, Ariz	197	1,345.18	6.19	31.4	39.22	2	10.15	2	10.15
Whipple Barracks, Ariz	192	1,135.42	6.25	32.6	41.54	2	10.42	8	41.67
Fort Missoula, Mont	189	603.17	3.48	16.4	20.64	....	....	6	31.75
Fort Niagara, N. Y	188	670.21	4.11	21.9	29.37	1	5.32	3	15.96
Mount Vernon Barracks, Ala	181	1,817.68	4.83	26.7	49.81	8	44.19	6	33.15
Fort Sully, S. Dak	176	1,414.77	2.96	16.8	39.99	....	....	2	11.36
Fort Wadsworth, N. Y	175	1,108.57	2.48	14.2	20.50	1	5.71	....	....
San Carlos, Ariz	167	1,365.27	5.12	30.7	43.21	....	....	5	29.94
Fort McHenry, Md	160	1,306.25	7.04	44.0	50.33	1	6.25	8	50.00
Fort Washakie, Wyo	155	677.42	2.58	16.7	20.27	2	12.90	....	....
Fort McIntosh, Tex	149	1,442.95	7.49	50.3	68.91	2	13.42	2	13.42
Fort Du Chesne, Utah	139	1,194.24	2.46	17.7	32.14	....	....	1	7.19
Fort Bowie, Ariz	136	1,242.65	4.44	32.6	44.91	2	14.70	....	....
Fort Spokane, Wash	135	518.52	2.83	21.0	25.26	1	7.41	2	14.81
Fort Ringgold, Tex	134	1,716.42	8.43	62.9	70.14	1	7.46	5	37.31
Fort Sidney, Nebr	134	1,014.93	2.26	16.9	26.99	....	....	1	7.46
Benicia Barracks, Cal	132	825.76	2.32	17.6	21.24	3	22.73	1	7.58
Fort Marcy, N. Mex	123	1,886.18	4.43	36.0	56.53	....	....	4	32.52
St. Francis Barracks, Fla	123	1,967.48	3.91	31.8	45.60	1	8.13	8	65.04
Alcatraz Island, Cal	117	1,025.64	3.75	32.1	40.35	....	....	2	17.09
Fort Brady, Mich	117	923.08	2.91	24.9	28.60	1	8.55	3	25.64
Fort Leavenworth Prison, Kans	115	843.47	2.21	19.2	26.11	2	17.39	2	17.39
Fort Warren, Mass	115	608.70	2.32	20.2	22.14	....	....	2	17.39
Fort Mackinac, Mich	114	736.84	1.22	10.7	15.48	....	....	....	....
Fort Stanton, N. Mex	112	1,250.00	2.12	18.9	43.28	....	....	2	17.86
Fort Bliss, Tex	107	822.43	2.56	23.9	25.25	2	18.69	1	9.34
Fort Canby, Wash	106	1,292.45	4.36	41.1	54.85	....	....	7	66.04
Jackson Barracks, La	106	1,650.94	5.07	47.8	57.51	1	9.43	8	75.47
Fort Porter, N. Y	105	1,133.33	3.24	30.9	35.91	....	....	1	9.52
Summary	4,099	1,157.36	113.36	27.7	37.68	33	8.05	92	22.45

TABLE IV.—*A general view of the results of disease and injury at each of the military stations, arranged in the order of their mean strength*—Continued.

GROUP 5.—Thirty-nine stations, garrisoned by 1 to 100 men each. Average, 53.

Military stations.	Mean strength.	Admission rate per 1,000 of mean strength.	Constantly noneffective.			Deaths.		Discharges.	
			Daily average in hospital.	Ratios per 1,000 of mean strength, of—		No.	Ratios per 1,000 of mean strength	No.	Ratios per 1,000 of mean strength
				Cases in hospital.	All cases.				
Boisé Barracks, Idaho	98	693.88	1.38	14.1	22.64	....	.....	2	20.41
Fort Schuyler, N. Y	98	1,255.10	2.03	20.7	33.68	3	30.61	1	10.20
Camp Poplar River, Mont	97	1,195.88	1.61	16.6	26.62	....	.....	3	30.93
Fort Randall, S. Dak	97	1,154.64	.92	9.5	21.57	3	30.93	....	.....
Fort Yellowstone, Wyo	76	1,105.26	.93	12.2	23.62	....	.....	....	.....
Fort Barrancas, Fla	75	1,986.67	5.03	67.1	70.64	....	.....	2	26.67
San Diego Barracks, Cal	69	942.03	4.66	67.5	78.88	....	.....	7	101.45
Rock Island Arsenal, Ill	65	1,292.31	.52	8.0	21.48	....	.....	....	.....
Fort Townsend, Wash	64	640.62	.50	7.8	13.66	....	.....	1	15.62
Fort Trumbull, Conn	62	1,048.39	2.15	34.7	36.93	....	.....	1	16.13
Fort Ontario, N. Y	61	967.21	1.46	23.9	33.33	1	16.39	2	32.79
Plattsburg Barracks, N. Y	61	1,196.72	1.07	17.5	25.62	....	.....	....	.....
Newport Barracks, Ky	60	1,200.00	1.28	21.3	33.70	1	16.67	....	.....
Fort Brown, Tex	59	576.27	1.97	33.4	36.91	2	33.90	4	67.80
Fort Mason, Cal	58	689.66	1.05	18.1	21.72	....	.....	1	17.24
Fort Bidwell, Cal	57	1,403.51	.98	17.2	33.41	....	.....	2	35.09
Fort Preble, Me	57	1,228.07	1.85	31.9	49.94	....	.....	3	52.63
Watervliet Arsenal, N. Y	55	1,472.73	1.03	18.7	60.96	....	.....	1	18.18
Fort Wood, N. J	54	685.19	.03	.6	4.55	1	18.52	....	.....
Benicia Arsenal, Cal	53	641.51	.18	3.4	16.13	1	18.87	....	.....
Camp at Eagle Pass, Tex	53	2,113.21	1.84	34.7	76.30	....	.....	3	56.60
Chicago, headquarters department of the Missouri, Ill	52	192.31	.....	.....	8.72	....	.....	....	.....
Sandy Hook, proving ground, N. J	52	1,884.62	.01	.2	19.13	....	.....	1	19.23
Fort Hancock, Tex	50	1,860.00	1.61	32.2	44.65	....	.....	1	20.00
Camp Pena Colorado, Tex	49	1,040.82	1.41	28.8	53.19	1	20.41	1	20.41
Camp Pilot Butte, Wyo	48	833.33	1.13	23.5	31.25	....	.....	....	.....
Frankford Arsenal, Pa	40	700.00	.10	2.5	32.51	2	50.00	....	.....
Camp Oklahoma, Okla	39	1,641.02	.91	23.3	43.22	....	.....	....	.....
Fort Pembina, N. Dak	39	435.90	.05	1.3	13.03	....	.....	....	.....
San Antonio, headquarters department of Texas, Tex	34	323.52	.02	.6	19.44	1	29.41	....	.....
Allegheny Arsenal, Pa	32	1,343.75	.39	12.2	56.01	1	31.25	1	31.25
Fort Gaston, Cal	32	968.75	.99	30.9	17.50	....	.....	....	.....
Watertown Arsenal, Mass	31	903.23	.16	5.2	16.75	....	.....	....	.....
Augusta Arsenal, Ga	27	370.37	.09	3.3	17.20	1	37.04	....	.....
Indianapolis Arsenal, Ind	25	1,680.00	.36	14.4	34.97	....	.....	....	.....
Springfield Armory, Mass	24	500.00	.....	.....	16.05	....	.....	....	.....
Fort Thomas, Ariz	20	600.00	1.26	63.0	44.12	....	.....	1	50.00
Columbia Arsenal, Tenn	19	2,631.58	.....	.....	85.42	1	52.63	....	.....
Kennebec Arsenal, Me	15	1,533.33	.....	.....	21.13	....	.....	....	.....
Summary	2,057	1,099.66	39.43	19.2	33.52	19	9.24	38	18.47

GROUP 6.—Field.

Department of the Platte	314	1,136.94	.....	.....	18.48	2	6.37	....	.....
Department of Arizona	154	759.74	.....	.....	11.74	1	6.49	....	.....
Department of Dakota	119	588.24	.....	.....	14.51	....	.....	....	.....
Department of the Columbia	118	491.53	.....	.....	5.46	1	8.47	....	.....
Department of California	110	718.18	.....	.....	13.84	1	9.09	....	.....
Department of Texas	98	1,183.67	.....	.....	16.25	....	.....	....	.....
Department of the Missouri	54	888.89	.....	.....	10.73	....	.....	....	.....
Department of the East	43	1,100.00	.....	.....	9.15	....	.....	....	.....
Summary	1,010	879.21	.....	.....	13.93	5	4.91	....	.....
Hot Springs (Army and Navy General Hospital), Ark	33	606.06	24.17	.....	.....	1	.....	23	.....
At large	.....	.....	.....	.....	.....	7	.....	35	.....
Total for the Army	24,203	1,270.42	647.06	26.73	39.60	173	6.44	493	18.35

TABLE V.—*Twenty posts having the highest admission rates for the year 1892, also their admission rates for the years 1887 to 1891, inclusive.*

Names of stations.	Mean strength.	Ratios per 1,000 of mean strength.				Admission rates per 1,000 of mean strength.				
		Admissions.	Deaths.	Discharges.	Constantly noneffective.	1891.	1890.	1889.	1888.	1887.
Fort Hamilton, N. Y	262	2,354.96	3.82	19.08	48.04	2,329.32	1,626.26	1,552.63	1,107.14	1,102.86
Davids Island, N. Y	555	2,115.32	3.60	10.81	46.31	1,884.82	1,642.86	1,259.07	1,533.12	1,437.28
Columbus Barracks, Ohio	591	2,059.23	11.84	13.54	71.98	2,209.89	1,876.49	2,318.86	2,075.66	1,942.36
Fort Barrancas, Fla	75	1,986.67	.....	26.67	70.64	2,629.63	1,674.42	1,360.66	1,109.09	1,037.04
Washington Barracks, D. C	332	1,981.93	3.01	12.05	43.22	1,774.19	1,329.41	1,139.44	1,723.48	1,767.79
St. Francis Barracks, Fla	123	1,967.48	8.13	65.04	45.60	3,121.50	2,015.38	1,568.97	1,378.79	1,718.75
Fort Reno, Okla	316	1,917.72	15.82	28.48	67.57	2,111.92	1,922.30	1,474.51	1,378.55	1,607.97
Fort Marcy, N. Mex	123	1,886.18	.....	32.52	56.53	1,500.00	1,209.09	1,606.67	1,494.12	1,287.50
Mount Vernon Barracks, Ala	181	1,817.68	44.19	33.15	49.81	1,291.93	1,522.52	1,344.83	1,368.42	1,071.43
Fort Supply, Ind. T	267	1,801.50	.....	26.22	47.01	1,192.66	1,334.93	1,112.68	1,604.56	1,049.06
Fort Monroe, Va	375	1,797.33	2.67	18.67	45.38	1,379.86	1,395.16	1,667.57	1,516.01	1,400.87
Fort Ringgold, Tex	134	1,716.42	7.46	37.31	70.14	1,366.07	865.55	562.50	818.84	1,037.59
Fort Sam Houston, Tex	427	1,683.84	11.71	37.47	58.93	1,985.97	2,430.69	1,262.61	943.60	1,570.67
Fort Sill, Okla	346	1,653.18	14.45	28.90	37.26	1,947.37	2,551.52	1,797.10	1,592.06	1,744.68
Jackson Barracks, La	106	1,650.94	9.43	75.47	57.51	1,771.43	2,163.04	1,875.00	910.45	884.61
Fort McPherson, Ga	399	1,634.09	7.52	17.54	58.04	2,394.98	2,489.36	3,416.67	.....	.....
Fort Myer, Va	236	1,618.64	12.71	25.42	40.55	1,063.58	1,350.36	1,186.05	1,391.30	2,093.75
Fort Yates, N. Dak	259	1,567.57	11.58	30.89	64.98	1,213.04	1,557.49	840.91	1,161.65	1,133.83
Fort Meade, S. Dak	413	1,556.90	2.42	41.16	44.91	1,861.11	853.90	1,312.14	1,121.77	1,935.06
Fort Clark, Tex	321	1,538.94	9.35	24.92	60.77	1,256.72	1,669.44	1,355.30	1,433.87	1,400.00
The Army	24,203	1,270.42	6.44	18.35	39.60	1,364.78	1,384.25	1,315.02	1,270.73	1,246.88

TABLE VI.—*Twenty posts having the highest noneffective rates for the year 1892; also, their noneffective rates for the years 1887 to 1891, inclusive.*

Names of stations.	Mean strength.	Constantly noneffective per 1,000 of mean strength.	Average sick daily.	Average of days each case was treated.	Constantly noneffective per 1,000 of mean strength.				
					1891.	1890.	1889.	1888.	1887.
Columbus Barracks, Ohio	591	71.98	42.54	12.79	77.13	77.55	92.74	81.87	74.51
Fort Barrancas, Fla	75	70.64	5.30	13.01	103.33	58.49	48.42	33.98	34.06
Fort Ringgold Tex	134	70.14	9.40	14.96	52.05	26.61	23.34	35.44	50.38
Fort McIntosh, Tex	149	68.91	10.27	17.48	54.97	25.31	53.75	62.23	58.38
Fort Reno, Okla	316	67.57	21.35	12.90	59.47	56.53	61.55	46.85	46.81
Fort Yates, N. Dak	259	64.98	16.83	15.17	53.03	51.14	42.43	41.05	37.81
Fort Clark, Tex	321	60.77	19.51	14.45	39.61	65.25	60.05	51.71	36.45
Fort Bayard, N. Mex	298	59.22	17.65	16.07	50.56	51.89	47.82	39.60	27.32
Fort Sam Houston, Tex	427	58.93	25.16	12.81	56.59	63.25	50.64	38.41	51.59
Fort McPherson, Ga	399	58.04	23.16	12.99	61.12	61.16	72.80	.....	.....
Jackson Barracks, La	106	57.51	6.10	12.75	68.70	70.64	35.75	17.78	19.07
Fort Marcy, N. Mex	123	56.53	6.95	10.97	38.87	24.96	44.47	47.32	28.12
Fort Canby, Wash	106	54.85	5.81	15.53	47.15	25.22	34.05	.....	20.46
Fort Custer, Mont	395	51.14	20.20	12.20	59.43	57.91	49.72	49.58	47.81
Fort Wayne, Mich	233	50.78	11.83	14.01	44.52	37.84	42.02	39.35	36.13
Fort McHenry, Md	160	50.33	8.05	14.10	60.34	63.73	53.71	62.99	59.67
Mount Vernon Barracks, Ala	181	49.81	9.02	10.03	56.59	68.57	54.86	37.82	36.71
Fort Hamilton, N. Y	262	48.04	12.57	7.46	52.50	41.91	41.40	29.11	32.31
Fort Grant, Ariz	286	47.61	13.61	12.24	34.91	32.09	47.45	50.76	80.15
Fort Supply, Ind. T	267	47.01	12.55	9.57	31.39	36.32	30.10	42.71	36.46
The Army	24,203	39.60	958.51	11.41	42.01	42.71	44.12	41.91	42.38

TABLE VII.—*Twenty posts having the highest admission rates for disease, excluding venereal diseases, vaccina and alcoholism, together with their ratios for deaths, discharges, and constant noneffectiveness; also, the corresponding average rates for the Army, year 1892.*

Names of stations.	Mean strength.	Ratios per 1,000 of mean strength.			
		Admissions.	Deaths.	Discharges.	Constantly noneffective.
Fort Hamilton, N. Y	262	1,862.60	3.82	15.26	31.08
Washington Barracks, D. C	332	1,563.27	.....	3.01	27.64
St. Francis Barracks, Fla	123	1,512.19	8.13	56.91	34.50
Fort Reno, Okla	316	1,481.02	12.66	22.15	49.89
Fort Supply, Ind. T	267	1,411.99	.....	7.49	31 00
Fort Barrancas, Fla	75	1,400.00	.....	13.33	51.01
Fort Monroe, Va	375	1,381.33	2.67	8.00	29.60
Columbus Barracks, Ohio	591	1,333.34	10.15	8.47	39.66
Fort Sill, Okla	346	1,312.14	11.56	28.90	29.51
Fort Marcy, N. Mex	123	1,300.82	.....	24.39	35.67
Mount Vernon Barracks, Ala	181	1,281.78	33.15	27.63	36.33
Fort Sam Houston, Tex	427	1,210.78	7.03	30.44	38.99
Fort Clark, Tex	321	1,149.52	9.35	12.45	43.45
Fort Custer, Mont	395	1,129.12	2.53	12.66	24.77
Davids Island, N. Y	555	1,115.32	1.80	5.41	20.06
Fort Yates, N. Dak	259	1,111.98	3.86	27.03	46.05
Fort Myer, Va	236	1,067.79	4.24	20.18	23.83
Fort McIntosh, Tex	149	1,067.12	6.71	6.71	38.26
Fort Bayard, N. Mex	298	1,053.68	6.71	3.36	41.34
West Point, N. Y	375	1,053.32	.....	5.33	17.72
The Army	24,203	857.74	4.25	14.18	24.42

TABLE VIII.—*Twenty posts having the highest noneffective rates for disease, excluding venereal diseases, vaccina and alcoholism, together with the average number sick daily and average duration of each case; also, the corresponding average rates of the Army, year 1892.*

Names of stations.	Mean strength.	Ratio per 1,000 of mean strength constantly noneffective.	Average number of sick daily.	Average number of days each case was treated.
Fort Barrancas, Fla	75	51.01	3.8	13.3
Fort Reno, Okla	316	49.89	15.8	12.3
Fort Ringgold, Tex	134	46.46	6.2	16.5
Fort Yates, N. Dak	259	46.05	11.9	15.2
Fort Clark, Tex	321	43.45	13.9	13.8
Fort Bayard, N. Mex	298	41.34	12.3	14.3
Columbus Barracks, Ohio	591	39.66	23.4	10.9
Fort Canby, Wash	106	39.14	4.1	15.2
Fort Sam Houston, Tex	427	38.99	16.6	11.8
Fort McIntosh, Tex	149	38.26	5.7	13.1
Fort Stanton, N. Mex	112	36.79	4.1	14.2
Mount Vernon Barracks, Ala	181	36.33	6.6	10.4
Fort Marcy, N. Mex	123	35.67	4.4	10.0
St. Francis Barracks, Fla	123	34.50	4.2	8.2
Jackson Barracks, La	106	33.10	3.5	12.2
Fort Hamilton, N. Y	262	31.08	8.1	6.1
Fort Wayne, Mich	233	31.07	7.2	11.7
Fort Supply, Ind. T	267	31.00	8.3	8.0
Fort McPherson, Ga	399	30.63	12.2	10.9
Fort Bowie, Ariz	136	29.76	4.0	14.7
The Army	24.203	24.42	590.8	10.4

TABLE IX.—*The military posts in each department, showing the rates of admission, death, discharge, and constant noneffectiveness for disease, not including venereal diseases, vaccina nor alcoholism, year 1892.*

DEPARTMENT OF THE EAST.

[Excluding venereal diseases, vaccina. alcoholism and injuries.]

Names of stations.	Mean strength.	Ratio per 1,000 of mean strength.			
		Admissions.	Deaths.	Discharges.	Constantly noneffective.
Columbia Arsenal, Tenn	19	2,210.53	.....	.....	62.69
Fort Hamilton, N. Y	262	1,862.60	3.82	15.26	31.08
Sandy Hook, N. J	52	1,653.85	.....	19.23	15.71
Washington Barracks, D. C	332	1,563.27	.....	3.01	27.64
St. Francis Barracks, Fla	123	1,512.19	8.13	56.91	34.50
Fort Barrancas, Fla	75	1,400.00	.....	13.33	51.01
Fort Monroe, Va	375	1,381.33	2.67	8.00	29.60
Columbus Barracks, Ohio	591	1,333.34	10.15	8.47	39.66
Mount Vernon Barracks, Ala	181	1,281.78	38.67	27.63	36.33
Watervliet Arsenal, N. Y	55	1,272.73	.....	18.18	55.79
Kennebec Arsenal, Me	15	1,200.00	.....	.....	15.12
Allegheny Arsenal, Pa	32	1,125.00	31.25	31.25	46.36
Davids Island, N. Y	555	1,115.32	1.80	5.41	20.06
Fort Myer, Va	236	1,067.79	4.24	20.18	23.83
West Point, N. Y	375	1,053.32	.....	5.33	17.72
Fort McPherson, Ga	399	1,030.09	7.52	15.04	30.63
Jackson Barracks, La	106	990.59	9.43	37.74	33.10
Newport Barracks, Ky	60	916.66	16.67	.....	24.46
Fort Preble, Me	57	912.29	.....	17.55	32.98
Plattsburg Barracks, N. Y	61	868.76	.....	.....	17.65
Watertown Arsenal, Mass	31	838.71	.....	.....	16.43
Fort McHenry, Md	160	818.75	6.25	37.50	25.41
Fort Trumbull, Conn	62	806.45	.....	.....	30.72
Fort Schuyler, N. Y	98	775.51	.....	10.20	18.92
Fort Thomas, Ky	268	764.92	.....	29.85	24.90
Madison Barracks, N. Y	333	759.76	6.01	21.02	24.57
Fort Wadsworth, N. Y	175	720.00	5.71	.....	13.14
Willets Point, N. Y	376	715.42	5.32	5.32	23.69
Frankford Arsenal, Pa	40	675.00	50.00	.....	24.38
Fort Adams, R. I	248	661.30	8.07	8.06	12.97
Fort Columbus, N. Y	244	586.06	4.10	8.19	26.04
Fort Porter, N. Y	105	580.97	.....	9.52	17.81
Fort Ontario, N. Y	61	563.77	.....	16.39	20.61
Fort Niagara, N. Y	188	452.12	.....	15.96	19.79
Fort Wood, N. Y	54	444.44	.....	.....	1.72
Springfield Armory, Mass	24	375.00	.....	.....	9.34
Augusta Arsenal, Ga	27	370.37	37.04	.....	17.20
Fort Warren, Mass	115	347.83	.....	17.39	13.10
Field	43	697.67	.....	.....	5.66
Total	6,613	1,027.39	5.45	12.86	25.51

DEPARTMENT OF THE MISSOURI.

[Excluding venereal diseases, vaccina, alcoholism and injuries.]

Fort Reno, Okla	316	1,481.02	12.66	22.15	49.89
Fort Supply, Ind. T	207	1,411.99	.....	7.49	31.00
Indianapolis Arsenal, Ind	25	1,400.00	.....	.....	26.23
Fort Sill, Okla	346	1,312.14	11.56	28.90	29.51
Fort Wayne, Mich	233	974.25	4.29	25.75	31.07
Fort Sheridan, Ill	527	969.56	5.69	15.18	20.54
Camp Oklahoma, Okla	39	948.73	.....	.....	18.92
Rock Island Arsenal, Ill	65	907.69	.....	.....	11.68
Fort Riley, Kans	686	702.62	.....	11.66	16.92
Leavenworth Prison, Kans	115	678.26	8.70	17.39	14.09
Fort Leavenworth, Kans	716	663.41	1.40	4.19	17.12
Jefferson Barracks, Mo	506	503.95	.....	1.98	15.23
Fort Mackinac, Mich	114	473.70	.....	.....	9.74
Fort Brady, Mich	117	418.80	.....	8.55	9.78
Chicago, Ill	52	173.08	.....	.....	7.99
Field	54	462.96	.....	.....	5.46
Total	4,178	860.71	3.35	11.49	21.70

TABLE IX.—*The military posts in each department, showing the rates of admission, death, discharge, and constant noneffectiveness for disease, etc*—Continued.

DEPARTMENT OF DAKOTA.

[Excluding venereal diseases, vaccina, alcoholism and injuries.]

Names of stations.	Mean strength.	Ratios per 1,000 of mean strength.			
		Admissions.	Deaths.	Discharges.	Constantly noneffective.
Fort Custer, Mont	395	1,129.12	2.53	12.66	24.77
Fort Yates, N. Dak	259	1,111.98	3.86	27.03	46.05
Fort Meade, S. Dak	413	987.89	2.42	31.48	24.26
Fort Sully, S. Dak	176	965.92	.....	.....	24.62
Fort Keogh, Mont	386	875.65	5.18	12.95	25.53
Fort Snelling, Minn	412	844.67	9.71	9.71	26.43
Fort Buford, N. Dak	213	826.30	4.69	14.08	16.03
Fort Assinniboine, Mont	459	825.72	4.36	21.79	28.76
Camp Poplar River, Mont	97	814.43	.....	30.93	18.65
Fort Yellowstone, Wyo	76	710.53	.....	.....	12.55
Fort Missoula, Mont	189	444.45	.....	21.17	13.22
Fort Pembina, N. Dak	39	410.26	.....	.....	12.40
Field	119	386.55	.....	.....	5.51
Total	3,233	875.98	3.71	16.71	24.69

DEPARTMENT OF THE PLATTE.

[Excluding venereal diseases, vaccina, alcoholism and injuries.]

Fort McKinney, Wyo	270	851.86	.....	7.41	24.98
Fort Robinson, Nebr	349	828.07	8.60	2.87	17.08
Fort Omaha, Nebr	483	770.17	6.21	18.99	18.64
Fort Sidney, Nebr	134	738.81	.....	.....	17.27
Fort Niobrara, Nebr	336	732.15	2.98	8.92	22.52
Fort Douglas, Utah	485	731.96	2.06	8.25	20.24
Fort Du Chesne, Utah	139	726.61	.....	7.19	19.07
Fort Logan, Colo	332	674.71	6.02	9.04	23.41
Camp Pilot Butte, Wyo	48	645.84	.....	.....	27.72
Fort Randall, S. Dak	97	639.18	.....	.....	10.76
Fort D. A. Russell, Wyo	429	489.50	4.66	9.32	17.62
Fort Washakie, Wyo	155	406.46	.....	.....	8.23
Field	314	850.32	.....	.....	12.49
Total	3,571	713.82	3.64	8.96	18.73

DEPARTMENT OF TEXAS.

[Excluding venereal diseases, vaccina, alcoholism and injuries.]

Camp at Eagle Pass, Tex	53	1,622.64	.....	56.60	55.13
Fort Sam Houston, Tex	427	1,210.78	7.03	30.44	38.99
Fort Clark, Tex	321	1,149.52	9.35	12.45	43.45
Fort McIntosh, Tex	149	1,067.12	6.71	6.71	38.26
Fort Ringgold, Tex	134	1,029.83	.....	37.31	46.46
Fort Hancock, Tex	50	1,000.00	.....	20.00	22.74
Camp Pena Colorado, Tex	49	693.86	20.41	.....	28.60
Fort Bliss, Tex	107	514.02	18.69	9.34	12.77
Fort Brown, Tex	59	389.83	.....	50.85	14.04
San Antonio, Tex	34	294.11	29.41	.....	18.64
Field	98	765.30	.....	.....	8.68
Total	1,481	1,023.64	7.43	20.92	34.87

TABLE IX.—*The military posts in each department, showing the rates of admission, death, discharge, and constant noneffectiveness for disease, etc.*—Continued.

DEPARTMENT OF ARIZONA.

[Excluding venereal diseases, vaccina, alcoholism and injuries.]

Names of stations.	Mean strength.	Ratios per 1,000 of mean strength.			
		Admissions.	Deaths.	Discharges.	Constantly noneffective.
Fort Marcy, N. Mex	123	1,300.82	.....	24.39	35.67
Fort Bayard, N. Mex	298	1,053.68	6.71	3.36	41.34
San Carlos, Ariz	167	964.07	.....	17.96	29.61
Fort Grant, Ariz	286	954.54	13.99	38.46	27.42
Fort Stanton, N. Mex	112	946.42	.....	17.86	36.79
Fort Wingate, N. Mex	358	918.99	2.79	2.79	18.19
Fort Apache, Ariz	197	898.48	5.08	10.15	27.60
Fort Bowie, Ariz	136	742.65	14.70	.....	29.76
Whipple Barracks, Ariz	192	729.16	10.42	41.67	25.91
San Diego Barracks, Cal	69	681.16	.....	71.47	60.31
Fort Huachuca, Ariz	318	547.17	6.29	3.14	14.97
Fort Thomas, Ariz	20	400.00	.....	50.00	35.52
Field	154	467.54	.....	.....	6.05
Total	2,430	848.57	5.76	15.64	26.80

DEPARTMENT OF CALIFORNIA.

[Excluding venereal diseases, vaccina, alcoholism and injuries.]

Fort Bidwell, Cal	57	877.19	.....	35.09	21.42
Alcatraz Island, Cal	117	641.02	.....	8.54	18.93
Angel Island, Cal	276	608.68	.....	39.86	22.27
Presidio of San Francisco, Cal	465	591.40	.....	2.15	18.27
Fort Gaston, Cal	32	562.50	.....	.....	7.43
Benicia Barracks, Cal	132	507.57	15.15	7.58	10.21
Benicia Arsenal, Cal	53	377.36	.....	.....	11.23
Fort Mason, Cal	58	310.35	.....	.....	12.01
Field	110	372.73	.....	.....	5.45
Total	1,300	563.08	1.54	13.07	17.23

DEPARTMENT OF THE COLUMBIA.

[Excluding venereal diseases, vaccina, alcoholism and injuries.]

Fort Canby, Wash	106	943.40	.....	47.17	39.14
Fort Walla Walla, Wash	204	735.30	4.90	4.90	25.34
Boise Barracks, Idaho	98	500.01	.....	20.41	19.15
Vancouver Barracks, Wash	407	452.07	2.46	24.57	19.92
Fort Sherman, Idaho	232	400.86	.....	4.31	14.82
Fort Townsend, Wash	64	296.89	.....	15.62	6.18
Fort Spokane, Wash	135	259.25	7.41	7.41	10.07
Field	118	279.68	8.47	.....	2.49
Total	1,364	486.08	2.94	15.40	18.19

TABLE X.—*The monthly prevalence of disease among the white, colored and Indian troops of the Army during the year 1892.*

Months.		Mean strength.	Admitted to sick report. Number. Venereal, alcoholism, and injuries.	Other diseases.	All diseases and injuries.	Ratios per 1,000 of mean strength. Venereal, alcoholism, and injuries.	Other diseases.	All diseases and injuries.	Constantly noneffective. Days. Venereal, alcoholism, and injuries.	Other diseases.	All diseases and injuries.	Ratios per 1,000 of mean strength. Venereal, alcoholism, and injuries.	Other diseases.	All diseases and injuries.
Jan...	W.	21,438	639	2,523	3,162	29.81	117.69	147.50	9,706	22,838	32,544	14.60	34.37	48.97
	C..	2,022	69	248	317	34.12	122.65	156.77	1,265	2,254	3,519	20.18	35.96	56.14
	I..	610	20	79	99	32.79	129.51	162.30	282	622	904	14.91	32.89	47.81
	T..	24,070	728	2,850	3,578	30.25	118.41	148.65	11,253	25,714	36,967	15.08	34.49	49.54
Feb...	W.	21,858	564	1,717	2,281	25.80	78.55	104.35	7,754	18,033	25,787	12.23	28.45	40.68
	C..	2,011	71	203	274	35.30	100.94	136.24	1,037	2,070	3,107	17.78	35.50	53.28
	I..	698	27	68	95	38.68	97.42	136.10	318	498	816	15.71	24.60	40.31
	T..	24,567	662	1,988	2,650	26.95	80.93	107.87	9,109	20,601	29,710	12.78	28.94	41.69
Mar..	W.	21,878	646	1,711	2,357	29.53	78.21	107.73	8,409	17,937	26,346	12.40	26.44	38.88
	C..	2,032	62	160	222	30.51	78.74	109.25	845	1,949	2,794	13.41	30.94	44.35
	I..	723	24	58	82	33.19	80.22	113.41	258	582	840	11.51	25.97	37.48
	T..	24,633	732	1,929	2,661	29.72	78.30	108.03	9,512	20,468	29,980	12.46	26.80	39.27
Apr..	W.	21,625	599	1,413	2,012	27.70	65.34	93.04	8,303	16,081	24,384	12.80	24.79	37.59
	C..	2,027	66	121	187	32.56	59.69	92.25	760	1,524	2,284	12.50	25.06	37.56
	I..	751	16	43	59	21.30	57.25	78.56	222	446	668	9.85	19.79	29.65
	T..	24,403	681	1,577	2,258	27.90	64.63	92.53	9,285	18,051	27,336	12.68	24.66	37.34
May..	W.	21,598	665	1,451	2,116	30.79	67.19	97.98	8,950	16,237	25,187	13.37	24.25	37.62
	C..	1,978	74	140	214	37.41	70.78	108.18	935	1,559	2,494	15.25	25.43	40.68
	I..	761	26	45	71	34.17	59.13	93.30	339	401	740	14.37	17.00	31.37
	T..	24,337	765	1,636	2,401	31.44	67.23	98.66	10,224	18,197	28,421	13.56	24.12	37.67
June..	W.	21,258	732	1,439	2,171	34.44	67.69	102.13	9,560	15,084	24,644	14.99	23.65	38.64
	C..	2,007	69	145	214	34.38	72.25	106.63	830	1,320	2,150	13.79	21.92	35.71
	I..	771	19	46	65	24.64	59.66	84.30	354	498	852	15.31	21.53	36.84
	T..	24,036	820	1,630	2,450	34.12	67.82	101.94	10,744	16,902	27,646	14.90	23.44	38.34
July..	W.	21,568	747	1,567	2,314	34.64	72.66	107.29	9,570	15,312	24,882	14.31	22.90	37.21
	C..	2,041	69	159	228	33.81	77.90	111.71	947	1,308	2,255	14.97	20.67	35.64
	I..	748	38	57	95	50.80	76.20	127.00	565	585	1,150	24.37	25.23	49.60
	T..	24,357	854	1,783	2,637	35.06	73.20	108.26	11,082	17,205	28,287	14.68	22.78	37.46
Aug..	W.	21,210	682	1,642	2,324	32.15	77.42	109.57	9,129	15,375	24,504	13.88	23.40	37.27
	C..	1,978	65	138	203	32.86	69.77	102.63	726	1,216	1,942	11.84	19.83	31.67
	I..	794	30	42	72	37.78	52.90	90.68	475	488	963	19.30	19.83	39.12
	T..	23,982	777	1,822	2,599	32.40	75.97	108.37	10,330	17,079	27,409	13.89	22.97	36.86
Sept..	W.	21,055	657	1,645	2,302	31.20	78.13	109.33	8,401	15,956	24,357	13.30	25.26	38.56
	C..	1,976	63	141	204	31.88	71.36	103.24	884	1,045	1,929	14.91	17.63	32.54
	I..	714	24	48	72	33.61	67.23	100.84	522	560	1,082	24.37	26.14	50.52
	T..	23,745	744	1,834	2,578	31.33	77.24	108.57	9,807	17,561	27,368	13.77	24.65	38.42
Oct...	W.	20,868	655	1,440	2,095	31.39	69.01	100.40	9,271	16,113	25,384	14.33	24.90	39.24
	C..	2,134	58	104	162	27.18	48.73	75.91	991	1,114	2,105	14.98	16.84	31.82
	I..	747	26	32	58	34.80	42.84	77.64	415	654	1,069	17.92	28.24	46.16
	T..	23,749	739	1,576	2,315	31.12	66.36	97.48	10,677	17,881	28,558	14.50	24.29	38.79
Nov..	W.	21,324	589	1,425	2,014	27.62	66.82	94.44	8,834	16,810	25,644	13.81	26.28	40.09
	C..	2,166	55	99	154	25.39	45.71	71.10	991	1,081	2,072	15.25	16.64	31.89
	I..	725	27	32	59	37.24	44.14	81.38	339	557	896	15.59	25.61	41.20
	T..	24,215	671	1,556	2,227	27.71	64.26	91.97	10,164	18,448	28,612	13.99	25.39	39.38
Dec...	W.	21,562	615	1,536	2,151	28.52	71.24	99.76	9,729	18,017	27,746	14.55	26.95	41.50
	C..	2,062	67	115	182	32.49	55.77	88.26	981	1,096	2,077	15.35	17.14	32.49
	I..	722	20	41	61	27.70	56.78	84.49	256	442	698	11.44	19.75	31.18
	T..	24,346	702	1,692	2,394	28.84	69.50	98.34	10,966	19,555	30,521	14.53	25.91	40.44
Year..	W.	21,437	7,790	19,509	27,299	363.39	910.06	1,273.45	107,616	203,793	311,409	13.72	25.97	39.69
	C..	2,036	788	1,773	2,561	387.03	870.83	1,257.86	11,192	17,536	28,728	15.02	23.53	38.55
	I..	730	297	591	888	406.85	809.59	1,216.44	4,345	6,333	10,678	16.26	23.71	39.97
	T..	24,203	8,875	21,873	30,748	366.69	903.73	1,270.42	123,153	227,662	350,815	13.90	25.70	39.60

TABLE XI.—*The rates per 1,000 of strength of admission, death, discharge and non-effectiveness of the U. S. Army and of the troops in the several departments for the year 1892, as compared with those of the decade 1881–'90, and of certain foreign armies.*

Names of armies or departments.	U. S. Army, 1892.				U. S. Army, white, 1892.			
Mean strength (corrected for time).	24,203.				21,437.			
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Constantly noneffective.	Admissions.	Deaths.	Discharges.	Constantly noneffective.
Enteric fever	5.95	.48	.....	.90	6.62	.50	.....	.99
Other specific contagious and infectious diseases, including erysipelas	93.71	.30	.....	2.51	93.21	.30	.....	2.56
Malarial fevers and resulting conditions	63.75	.....	.04	1.76	68.43	.....	.04	1.90
Typho-malarial fever	.29	.04	.....	.05	.33	.04	.....	.06
Diarrhea, including cholera morbus	108.03	.....	.....	1.01	113.17	.....	.....	1.06
Dysentery	2.81	.....	.04	.12	2.57	.....	.04	.10
Other miasmatic diseases	.04	.04	.....	.001	.05	.04	.....	.001
Gonorrhea and results	40.90	.....	.37	2.36	41.42	.....	.38	2.39
Syphilis and results	16.03	.....	1.56	1.68	15.11	.....	1.47	1.60
Other venereal diseases	19.79	.....	.04	1.28	18.98	.....	.04	1.25
Vaccina	45.45	.....	.....	1.26	47.07	.....	.....	1.32
Other enthetic diseases	1.74	.....	.....	.07	1.77	.....	.....	.06
Alcoholism	37.23	.11	.....	.45	41.19	.13	.....	.50
Other dietic diseases	.58	.....	.04	.03	.61	.....	.04	.03
Rheumatism (including muscular)	71.52	.04	1.41	3.32	67.31	.04	1.42	3.22
Other constitutional diseases	3.93	.11	.26	.37	3.78	.13	.25	.35
Developmental diseases	.62	.....	.63	.06	.61	.....	.67	.07
Parasitic diseases	2.56	.....	.....	.07	2.85	.....	.....	.08
Headache and neuralgia	40.37	.....	.07	.66	40.03	.....	.08	.66
Other diseases of the nervous system	8.92	.56	2.23	.85	9.52	.59	2.43	.91
Diseases of the eye	17.93	.....	1.01	.64	16.42	.....	1.01	.61
Diseases of the ear	6.98	.....	.52	.33	7.09	.....	.59	.36
Catarrhs and common colds	30.78	.....	.....	.30	32.37	.....	.....	.33
Bronchitis	78.63	.04	.19	1.48	78.83	.04	.21	1.50
Pneumonia	3.43	.63	.04	.30	3.36	.67	.04	.31
Pulmonary phthisis	4.34	.71	1.97	.90	3.27	.42	1.47	.76
Pleuritis	1.82	.07	.07	.10	1.73	.08	.....	.07
Other diseases of the respiratory system	5.45	.04	.22	.23	5.18	.04	.21	.22
Diseases of the heart and valves	5.21	.48	1.34	.46	5.50	.50	1.34	.49
Other diseases of the circulatory system	1.24	.04	.30	.14	1.40	.04	.34	.15
Tonsillitis	41.90	.....	.....	.63	42.26	.....	.....	.63
Dyspepsia, colic, and constipation	62.19	.....	.11	.76	59.43	.....	.08	.75
Other diseases of the digestive system	69.66	.26	.97	1.79	69.89	.25	.96	1.81
Diseases of the kidneys	1.57	.30	.19	.15	1.68	.34	.21	.16
Other diseases of the genito-urinary system (nonvenereal)	13.63	.....	.56	.80	13.11	.....	.63	.75
Diseases of the locomotor system (excluding muscular rheumatism)	5.78	.....	1.34	.51	5.83	.....	1.38	.52
Diseases of the integumentary system	79.99	.....	.34	2.17	82.05	.....	.34	2.22
All other diseases	22.93	.07	.34	.95	22.76	.04	.38	.95
Heat stroke	2.77	.....	.....	.04	2.94	.....	.....	.04
Frostbite and general freezing	2.73	.....	.04	.13	2.01	.....	.04	.08
Contusions and sprains	134.32	.....	.19	3.24	131.27	.....	.21	3.19
Dislocations	2.56	.....	.15	.19	2.43	.....	.13	.19
Fractures (not gunshot)	6.98	.15	.45	1.36	7.00	.13	.46	1.37
Incised, lacerated, contused, and punctured wounds	55.32	.....	.19	1.55	53.09	.....	.21	1.51
Shot wounds	3.22	1.01	.60	.50	2.80	.80	.59	.46
All other injuries	44.83	.93	.56	1.12	45.16	1.01	.59	1.15
Total for disease	1,017.68	4.36	16.19	31.48	1,026.78	4.23	16.04	31.71
Total for injuries	252.74	2.08	2.16	8.12	246.68	1.93	2.22	7.98
Total for all causes	1,270.42	6.44	18.35	39.60	1,273.45	6.15	18.26	39.69
Enteric fever (including typho-malarial fever)	6.24	.52	.....	.95	6.95	.54	.....	1.05
Other specific contagious and infectious diseases (including erysipelas and tonsillitis)	135.61	.34	.....	3.14	135.47	.34	.....	3.19
Other diseases of the digestive system (excluding hernia)	67.64	.26	.19	1.57	67.88	.25	.21	1.60
Hernia	2.02	.....	.78	.22	2.01	.....	.75	.21
Total for disease (excluding hernia)	1,015.66	4.36	15.41	31.26	1,024.77	4.23	15.29	31.50
Total for injuries (including hernia)	254.76	2.08	2.94	8.34	248.69	1.88	2.97	8.19

TABLE XI.—*The rates per 1,000 of strength, of admission, death, discharge and non-effectiveness of the U. S. Army, etc.*—Continued.

Names of armies or departments.	U. S. Army, colored, 1892.				U. S. Army, Indian, 1892.			
Mean strength (corrected for time).	2,036.				730.			
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Constantly noneffective.	Admissions.	Deaths.	Discharges.	Constantly noneffective.
Enteric fever	.98	.45	.....	.24	.....	.....	.....	.....
Other specific contagious and infectious diseases, including erysipelas	108.05	.45	.....	2.52	68.49	.....	.....	1.09
Malarial fevers and resulting conditions	26.03	.....	.....	.77	31.51	.....	.....	.44
Typho-malarial fever	.....	.....	.....	.....	.....	.....	.....	.....
Diarrhea, including cholera morbus	75.64	.....	.....	.68	47.95	.....	.....	.38
Dysentery	3.44	.....	.....	.26	8.22	.....	.....	.30
Other miasmatic diseases	.....	.....	.....	.....	.....	.....	.....	.....
Gonorrhea and results	32.91	.....	.45	1.85	47.95	.....	.....	2.78
Syphilis and results	25.54	.....	3.18	2.53	16.44	.....	.....	1.93
Other venereal diseases	28.49	.....	.....	1.79	19.18	.....	.....	1.01
Vaccina	27.51	.....	.....	.69	47.95	.....	.....	1.34
Other enthetic diseases	1.96	.....	.....	.14	.....	.....	.....	.....
Alcoholism	8.35	.....	.....	.07	1.37	.....	.....	.02
Other dietic diseases	.49	.....	.....	.02	.....	.....	.....	.....
Rheumatism (including muscular)	116.41	.....	.91	4.92	69.87	.....	2.55	1.83
Other constitutional diseases	2.46	.....	.45	.26	12.33	.....	.....	1.27
Developmental diseases	.49	.....	.....	.02	1.37	.....	1.28	.06
Parasitic diseases	.49	.....	.....	.01	.....	.....	.....	.....
Headache and neuralgia	45.68	.....	.....	.79	35.62	.....	.....	.43
Other diseases of the nervous system	4.42	.....	.45	.41	4.11	1.28	1.28	.31
Diseases of the eye	19.65	.....	.91	.78	57.53	.....	1.28	1.38
Diseases of the ear	4.91	.....	.....	.12	9.59	.....	.....	.13
Catarrhs and common colds	19.16	.....	.....	.16	16.44	.....	.....	.10
Bronchitis	81.54	.....	.....	1.40	64.38	.....	.....	.98
Pneumonia	3.93	.45	.....	.17	4.11	.....	.....	.27
Pulmonary phthisis	4.42	.91	2.27	.98	35.62	8.94	16.60	5.00
Pleuritis	1.96	.....	.....	.14	4.11	.....	2.55	.76
Other diseases of the respiratory system	6.88	.....	.....	.17	9.59	.....	1.28	.62
Diseases of the heart and valves	3.44	.45	1.82	.26	1.37	.....	.....	.04
Other diseases of the circulatory system	.....	.....	.....	.....	.....	.....	.....	.....
Tonsillitis	40.28	.....	.....	.65	35.62	.....	.....	.55
Dyspepsia, colic, and constipation	85.47	.....	.45	.83	78.08	.....	.....	.86
Other diseases of the digestive system	74.66	.45	1.36	1.72	49.32	.....	.....	1.24
Diseases of the kidneys	.98	.....	.....	.11	.....	.....	.....	.....
Other diseases of the genito-urinary system (nonvenereal)	18.66	.....	.....	1.38	15.07	.....	.....	.54
Diseases of the locomotor system (excluding muscular rheumatism)	5.89	.....	.91	.47	4.11	.....	1.28	.37
Diseases of the integumentary system	58.94	.....	.45	1.54	78.08	.....	.....	2.39
All other diseases	26.03	.....	.....	.91	19.18	1.28	.....	1.02
Heat stroke	1.96	.....	.....	.01	.....	.....	.....	.....
Frostbite and general freezing	10.80	.....	.....	.63	1.37	.....	.....	.22
Contusions and sprains	167.49	.....	.....	4.05	131.51	.....	.....	2.65
Dislocations	2.46	.....	.45	.08	6.85	.....	.....	.35
Fractures (not gunshot)	4.42	.....	.45	.98	13.70	1.28	.....	2.23
Incised, lacerated, contused, and punctured wounds	59.92	.....	.....	1.57	108.23	.....	.....	2.55
Shot wounds	5.89	1.36	.....	.54	8.22	6.39	2.55	1.62
All other injuries	38.80	.45	.....	.92	52.05	1.28	1.28	.92
Total for disease	966.11	3.18	13.63	29.76	894.52	11.49	28.09	29.44
Total for injuries	291.75	1.82	.91	8.79	321.92	8.94	3.83	10.52
Total for all causes	1,257.86	5.00	14.54	38.55	1,216.44	20.43	31.93	39.97
Enteric fever, including typho-malarial fever	.98	.45	.....	.24	.....	.....	.....	.....
Other specific contagious and infectious diseases, including erysipelas and tonsillitis	148.33	.45	.....	3.17	104.11	.....	.....	1.64
Other diseases of the digestive system (excluding hernia)	71.71	.45	.....	1.35	49.32	.....	.....	1.24
Hernia	2.95	.....	1.36	.37	.....	.....	.....	.....
Total for disease (excluding hernia)	963.16	3.18	12.27	29.39	894.52	11.49	28.09	29.44
Total for injuries (including hernia)	294.70	1.82	2.27	9.16	321.92	8.94	3.83	10.52

TABLE XI.—*The rates per 1,000 of strength, of admission, death, discharge and non-effectiveness of the U. S. Army, etc.*—Continued.

Names of armies or departments.	U.S. Army, 1881–1890.			U. S. Army, white. 1881–1890.			U. S. Army, colored, 1881–1890.		
Mean strength (corrected for time).	23,945.			21,640.			2,305.		
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Admissions.	Deaths.	Discharges.	Admissions.	Deaths.	Discharges.
Enteric fever	5.42	.74	.04	5.68	.76	.04	2.91	.59	.....
Other specific contagious and infectious diseases, including erysipelas	34.15	.17	.02	32.30	.17	.03	51.58	.16	.....
Malarial fevers and resulting conditions	142.72	.24	.16	142.57	.23	.17	143.99	.36	.12
Typho-malarial fever	1.86	.23	.....	1.90	.20	.....	1.43	.51	.....
Diarrhea, including cholera morbus	150.74	.06	.26	150.93	.07	.27	148.98	.....	.24
Dysentery	11.56	.16	.20	10.90	.15	.20	17.70	.28	.24
Other miasmatic diseases	.04	.04	.....	.03	.03	.....	.09	.08	.....
Gonorrhea and results	34.34	.....	.28	34.26	.....	.30	35.19	.....	.08
Syphilis and results	34.72	.02	3.47	33.15	.02	3.33	49.50	.04	4.85
Other venereal diseases	8.25	.....	.12	8.20	.....	.11	8.68	.....	.12
Vaccina	16.01	.....	.....	16.10	.....	.....	15.14	.....	.....
Other enthetic diseases	2.44	.01	.01	2.33	.01	.01	3.47	.....	.....
Alcoholism	52.21	.20	.31	57.35	.22	.34	3.90	.....	.04
Other dietic diseases	.57	.01	.07	.60	.01	.08	.35	.....	.04
Rheumatism (including muscular)	102.00	.04	2.84	98.22	.04	2.79	137.48	.04	3.27
Other constitutional diseases	9.30	.21	.68	9.13	.20	.63	10.93	.36	1.18
Developmental diseases	.....	.....	.....	.....	.....	.....	.....	.....	.....
Parasitic diseases	3.32	.....	.004	3.52	.....	.004	1.48	.....	.....
Headache and neuralgia	80.08	.....	.35	76.82	.....	.35	110.67	.....	.39
Other diseases of the nervous system	11.61	.54	3.70	11.86	.55	3.77	9.28	.47	3.00
Diseases of the eye	22.26	.....	1.33	21.71	.....	1.32	27.37	.....	1.50
Diseases of the ear	8.46	.01	.84	8.97	.01	.89	3.64	.....	.36
Catarrhs and common colds	74.30	.....	.03	72.78	.....	.03	88.63	.....	.04
Bronchitis	70.06	.08	.52	69.09	.09	.54	79.22	.....	.32
Pneumonia	4.65	.79	.13	4.32	.68	.12	7.81	1.85	.24
Pulmonary phthisis	3.47	.57	1.99	3.39	.54	1.98	4.29	.87	2.13
Pleuritis	3.24	.03	.12	2.85	.03	.11	6.90	.08	.16
Other diseases of the respiratory system	8.52	.10	.48	8.10	.09	.50	1.26	.20	.28
Diseases of the heart and valves	3.03	.28	1.46	3.04	.29	1.49	2.95	.20	1.18
Other diseases of the circulatory system	5.46	.36	1.04	5.69	.35	1.10	3.34	.47	.51
Tonsillitis	50.91	.....	.01	48.92	.....	.01	69.59	.....	.....
Dyspepsia, colic, and constipation	73.60	.....	.25	71.06	.....	.26	97.44	.....	.16
Other diseases of the digestive system	57.99	.54	2.06	57.28	.56	2.11	64.60	.36	1.66
Diseases of the kidneys	1.49	.24	.27	1.47	.24	.25	1.65	.24	.39
Other diseases of the genito-urinary system (nonvenereal)	17.25	.05	1.42	16.83	.06	1.38	21.17	.....	1.82
Diseases of the locomotor system (excluding muscular rheumatism)	5.97	.01	1.33	5.93	.004	1.30	6.29	.04	1.58
Diseases of the integumentary system	91.06	.01	.40	93.32	.01	.40	69.85	.....	.39
All other diseases	11.41	.05	.99	11.27	.05	1.03	1.29	.08	.59
Heat stroke	1.86	.02	.03	2.00	.03	.03	.56	.....	.04
Frostbite and general freezing	6.22	.07	.10	4.41	.08	.08	23.21	.04	.36
Contusions and sprains	143.96	.02	.54	142.63	.01	.52	156.48	.08	.75
Dislocations	2.48	.01	.16	2.51	.01	.17	2.21	.....	.12
Fractures (not gunshot)	6.75	.11	.74	6.93	.10	.77	5.08	.16	.47
Incised, lacerated, contused, and punctured wounds	43.36	.12	.28	41.50	.13	.26	60.87	.08	.43
Shot wounds	4.85	1.26	.98	4.31	1.20	.91	9.93	1.82	1.58
All other injuries	35.68	1.32	.66	35.92	1.36	.65	33.45	.99	.75
Total for disease	1,214.49	5.81	27.20	1,201.83	5.66	27.23	1,333.36	7.26	26.87
Total for injuries	245.16	2.93	3.50	240.19	2.91	3.39	291.80	3.16	4.50
Total for all causes	1,459.65	8.75	30.70	1,442.02	8.57	30.62	1,625.16	10.42	31.37
Enteric fever, including typho-malarial fever	7.28	.97	.04	7.58	.96	.04	4.34	1.10	.....
Other specific contagious and infectious diseases, including erysipelas and tonsillitis	85.06	.17	.03	81.22	.17	.04	121.17	.16	.....
Other diseases of the digestive system (excluding hernia)	55.02	.53	.68	54.30	.55	.70	61.74	.36	.56
Hernia	2.97	.01	1.38	2.98	.01	1.41	2.86	.....	1.10
Total for disease (excluding hernia)	1,211.52	5.80	25.82	1,198.85	5.65	25.82	1,330.50	7.26	25.77
Total for injuries (including hernia)	248.13	2.94	4.88	243.17	2.92	4.80	294.66	3.16	5.60

TABLE XI.—*The rates per 1,000 of strength, of admission, death, discharge and non-effectiveness of the U. S. Army, etc.*—Continued.

Names of armies or departments.	Austria-Hungary, 1891.			Great Britain, 1890.			Italy, 1891.			Prussia, Saxony and Würtemberg, 1889-1890.		
Mean strength (corrected for time).	284,743.			100,120.			220,714.			418,913.		
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Admissions.	Deaths.	Discharges.	Admissions.	Deaths.	Discharges.	Admissions.	Deaths.	Discharges.
Enteric fever	4.32	.79	.06	1.26	.29	.....	5.63	1.41	.....	4.37	.23	.....
Other specific contagious and infectious diseases, including erysipelas	14.13	.08	.01	75.00	.16	.....	17.04	.75	.....	112.81	.15	.....
Malarial fevers and resulting conditions	30.63	.01	.11	6.97	.01	.02	20.54	.14	.14	2.20	.....	.....
Typho-malarial fever	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Diarrhea, including cholera morbus	37.55	.01	.02	5.84	.01	.....	6.33	.....	.02	17.84	.....	.....
Dysentery	1.37	.07	.01	.73	.02	.04	.19	.01	.....	.29	.01	.....
Other miasmatic diseases	.08	.08	.....	.08	.03	.01	.01	.01	.....	.05	.04	.....
Gonorrhea and results	34.11	.....	.01	89.37	.....	.03	22.37	.....	.....	15.86	.....	.....
Syphilis and results	18.50	.....	.07	106.44	.03	.80	30.51	.....	.01	5.43	.....	.....
Other venereal diseases	11.15	.....	.01	16.54	.....	.....	18.75	.....	.....	5.44	.....	.....
Vaccina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other enthetic diseases	.18	.01	.....	.....	.....	.....	.....	.01	.....	.....	.....	.....
Alcoholism	.11	.02	.02	2.69	.04	.....	.06	.....	.....	1.65	.01	.....
Other dietic diseases	1.63	.01	.01	.07	.....	.....	.33	.01	.....	.12	.....	.....
Rheumatism (including muscular)	33.10	.01	.37	37.56	.06	.79	17.85	.04	.13	31.17	.01	.25
Other constitutional diseases	8.67	.24	1.63	4.99	.20	.57	2.69	.32	.52	3.17	.05	.29
Developmental diseases	1.55	.....	13.45	8.01	.....	1.01	.....	.01	.90	.....	.....	.46
Parasitic diseases	5.75	.01	.....	24.43	.....	.01	6.30	.....	.....	7.89	.....	.....
Headache and neuralgia Other diseases of the nervous system	7.22	.27	2.31	9.33	.35	1.89	5.38	.53	1.25	5.55	.18	1.00
Diseases of the eye	49.88	.....	6.81	11.77	.....	.68	11.90	.....	.90	27.86	.....	.45
Diseases of the ear	16.97	.....	5.97	7.58	.02	.76	6.21	.01	.32	12.89	.02	.35
Bronchitis	100.59	.01	1.62	55.93	.13		47.45	.49	.78	52.92	.01	
Pneumonia	7.66	.50	.07	8.75	1.26		9.49	1.69	.43	9.38	.44	
Pulmonary phthisis	3.91	1.00	3.11	3.97	1.16		1.10	1.32	1.09	2.47	.52	
Pleuritis	4.67	.13	.51	3.30	.05	3.08	13.35	.53	1.72	4.47	.16	4.63
Other diseases of the respiratory system (including catarrhs and common colds)	19.04	.07	.54	4.83	.09		1.10	.09	.02	20.10	.04	
Diseases of the heart and valves Other diseases of the circulatory system	19.11	.18	5.44	7.32 1.39	.33 .01	3.25	1.31	.12	1.33	2.12 1.52	.10	1.76
Tonsillitis and other diseases of mouth and throat	48.00	.....	.24	70.21	.....	.94	14.19	.....	.13	66.26	.01	.28
Other diseases of the digestive system	84.04	.20	8.27	31.31	.27		20.95	.42	2.65	51.00	.22	3.88
Diseases of the kidneys Other diseases of the genito-urinary system (nonvenereal)	15.82	.12	1.60	.53 15.28	.15	.51	.48 3.92	.08 .01	.28	.49 5.92	.06 .01	.31
Diseases of the locomotor system (excluding muscular rheumatism)	22.54	.10	4.95	7.78	.03	1.17	4.01	.04	.03	31.14	.03	2.63
Diseases of the integumentary system	190.94	.01	1.38	62.47	.01	.27	19.55	.03	.40	206.60	.01	.15
All other diseases	17.38	.01	.....	22.35	.01	.05	67.89	.....	.22	18.77	.01	.07
Heat stroke	.24	.02	.....				.....	.02		.25	.01	
Frostbite and general freezing	5.86	01	.07				.....	.....		5.67	.01	
Contusions and sprains	.....	.....	.15				9.58	.....		103.30	.02	
Dislocations	.67	.....	.27				.36	.....		1.08	.....	
Fractures (not gunshot)	2.06	.....	1.17	100.53	.79	.84	1.29	.....	.40	3.10	.03	.92
Incised, lacerated, contused, and punctured wounds	.....	.01	.63				3.84	.03		25.07	.01	
Shot wounds	1.69	.96	.25				.30	.27		.68	.33	
All other injuries	107.59	.53	.73				3.47	.58		30.02	.59	
Total for disease	810.54	3.94	58.60	710.08	4.74	15.88	376.88	8.06	13.87	728.03	2.32	16.51
Total for injuries	118.11	1.53	3.27	100.53	.79	.84	18.84	.90	.40	169.17	1.00	.92
Total for all causes	928.65	5.47	61.87	810.61	5.53	16.72	395.72	8.96	14.27	897.20	3.32	17.43

TABLE XI.—*The rates per 1,000 of strength, of admission, death, discharge and non-effectiveness of the U. S. Army, etc.*—Continued.

Names of armies or departments.	Austria-Hungary, 1891.			Great Britain, 1890.			Italy, 1891.			Prussia, Saxony and Würtemberg, 1889–1890.		
Mean strength (corrected for time).	284,743.			190,120.			220,714.			418,913.		
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Admissions.	Deaths.	Discharges.	Admissions.	Deaths.	Discharges.	Admissions.	Deaths.	Discharges.
Enteric fever, including typho-malarial fever	4.32	.79	.06	.....	.....	.....	5.63	1.41	.....	4.37	.23	.....
Other specific contagious and infectious diseases, including erysipelas and tonsillitis	56.95	.08	.01	.....	.....	.....	29.48	.75	.....	162.72	.15	.....
Other diseases of the digestive system, excluding hernia	84.93	.20	.43	.....	.....	.....	22.33	.42	.43	65.84	.21	.31
Hernia	4.29	....	7.84	.....	.....	.....	.37	....	2.52	1.51	.01	3.85
Total for disease, excluding hernia	806.25	3.94	50.76	.....	.....	.....	376.51	8.06	11.35	726.52	2.31	12.66
Total for injuries, including hernia	122.40	....	11.11	.....	.....	.....	19.21	.90	2.92	170.68	1.01	4.77

NOTE.—The Austrian table of admissions comprises all men treated during the year, and therefore includes those remaining at the end of 1890, while the Italian admissions are limited to those treated in hospitals and principal infirmaries.

Names of armies or departments.	Department of the East.				Department of the Missouri.				Department of Dakota.			
Mean strength (corrected for time).	6,613.				4,178.				3,233.			
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Constantly non-effective.	Admissions.	Deaths.	Discharges.	Constantly non-effective.	Admissions.	Deaths.	Discharges.	Constantly non-effective.
Enteric fever	6.50	.30	.....	1.08	10.77	1.20	.....	1.45	3.40	.31	.....	.54
Other specific contagious and infectious diseases, including erysipelas	110.84	.15	.....	3.61	102.68	.48	.....	2.10	134.85	.62	.....	2.96
Malarial fevers and resulting conditions	89.82	....	.15	1.77	119.67	....	.....	2.92	13.30	....	.....	.39
Typho-malarial fever	.91	.15	.....	.16	.....	.....	.....	.....	.....	.....	.....	.....
Diarrhea, including cholera morbus	148.18	....	.....	1.38	94.06	....	.....	.83	109.50	....	.....	1.05
Dysentery	3.63	....	.....	.10	1.20	....	.24	.07	3.40	....	.....	.27
Other miasmatic diseases	.15	....	.....	.002	.....	.....	.....	.....	.....	.....	.....	.....
Gonorrhœa and results	55.34	....	.45	3.07	39.01	....	.24	2.17	29.07	....	.31	1.89
Syphilis and results	21.47	....	2.72	2.19	6.75	....	1.44	1.39	12.68	....	.31	1.56
Other veneral diseases	22.83	....	.....	1.65	22.50	....	.....	1.58	12.37	....	.31	.77
Vaccina	95.26	....	.....	2.93	38.30	....	.....	.92	25.36	....	.....	.83
Other enthetic diseases	1.06	....	.....	.04	2.15	....	.....	.11	.31	....	.....	.01
Alcoholism	51.87	.45	.....	.58	29.68	....	.....	.34	29.38	....	.....	.47
Other dietic diseases	.45	....	.15	.04	.48	....	.....	.02	.....	.....	.....	.....
Rheumatism (including muscular)	75.91	.15	1.21	2.98	52.18	....	.48	1.60	86.30	....	2.17	4.15
Other constitutional diseases	5.59	.15	.....	.35	2.63	.24	.24	.19	4.95	....	.....	.58
Developmental diseases	.76	....	.91	.11	.24	....	.72	.01	.93	....	.93	.05
Parasitic diseases	3.33	....	.....	.09	3.59	....	.....	.12	1.55	....	.....	.02
Headache and neuralgia	58.82	....	.....	.77	30.88	....	.....	.36	40.21	....	.....	.75
Other diseases of the nervous system	10.58	.76	1.51	.92	8.86	.24	.72	.48	7.11	.62	1.55	.82
Diseases of the eye	14.21	....	.60	.61	16.28	....	.96	.50	23.20	....	1.86	.88
Diseases of the ear	8.62	....	.15	.35	6.70	....	.96	.30	5.26	....	1.55	.53
Catarrhs and common colds	61.24	....	.....	.59	15.08	....	.....	.16	15.77	....	.....	.10
Bronchitis	81.81	.15	.....	1.61	81.14	....	.24	1.23	98.30	....	.....	1.87

TABLE XI.—*The rates per 1,000 of strength, of admission, death, discharge and non-effectiveness of the U. S. Army, etc.*—Continued.

Names of armies or departments.	Department of the East.				Department of the Missouri.				Department of Dakota.			
Mean strength (corrected for time).	6,613.				4,178.				3,233.			
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Constantly non-effective.	Admissions.	Deaths.	Discharges.	Constantly non-effective.	Admissions.	Deaths.	Discharges.	Constantly non-effective.
Pneumonia	3.18	.76	.....	.28	2.87	.24	.....	.24	4.33	.62	.....	.37
Pulmonary phthisis	3.93	1.06	1.66	.60	2.39	.48	1.20	.26	5.57	.62	3.40	.71
Pleuritis	1.81	.....	.....	.04	2.87	.....	.48	.26	.62	.....	.....	.07
Other diseases of the respiratory system	4.54	.15	.30	.15	8.38	.....	.....	.46	3.40	.....	.31	.13
Diseases of the heart and valves	6.05	.91	1.81	.50	3.59	.....	1.20	.35	4.95	.31	.62	.49
Other diseases of the circulatory system	1.81	.....	.45	.13	.24	.....	.72	.05	.93	.....	.....	.03
Tonsillitis	47.03	.....	.....	.74	39.25	.....	.....	.54	43.30	.....	.....	.57
Dyspepsia, colic, and constipation	68.81	.....	.30	.80	60.80	.....	.....	.65	71.45	.....	.....	.99
Other diseases of the digestive system	75.15	.30	1.06	1.65	64.86	.....	.24	1.74	94.03	.31	1.24	2.00
Diseases of the kidneys	2.27	.45	.15	.13	2.15	.48	.48	.09	.93	.31	.31	.07
Other diseases of the genito-urinary system (nonvenereal)	12.70	.....	.30	.61	13.40	.....	.96	.89	15.15	.....	.31	1.23
Diseases of the locomotor system (excluding muscular rheumatism)	4.23	.....	1.51	.37	6.94	.....	1.44	.50	4.64	.....	1.55	.45
Diseases of the integumentary system	91.18	.....	.45	2.16	87.84	.....	.24	2.54	61.24	.....	.31	1.57
All other diseases	22.68	.....	.30	.84	16.99	.....	.....	.66	17.01	.....	.62	1.09
Heat stroke	4.23	.....	.....	.04	3.11	.....	.....	.05	1.86	.....	.....	.02
Frostbite and general freezing	.76	.....	.....	.01	2.15	.....	.....	.03	8.35	.....	.....	.34
Contusions and sprains	134.13	.....	.45	2.85	135.24	.....	.24	3.12	152.18	.....	.....	4.27
Dislocations	1.81	.....	.15	.15	2.63	.....	.24	.24	1.86	.....	.....	.13
Fractures (not gunshot)	5.75	.....	.15	.92	7.42	.48	.72	1.46	7.42	.....	.62	1.46
Incised, lacerated, contused, and punctured wounds	51.87	.....	.45	1.45	46.43	.....	.....	1.15	66.50	.....	.....	1.85
Shot wounds	2.42	.91	.45	.39	2.15	.72	.96	.41	4.33	1.24	.93	.54
All other injuries	39.92	1.36	.45	.78	44.52	1.20	.24	1.25	49.49	.62	.93	1.46
Total for disease	1,274.61	5.90	16.18	35.97	1,007.42	3.35	13.16	28.12	984.84	3.71	17.63	30.21
Total for injuries	240.89	2.27	2.12	6.59	243.65	2.39	2.39	7.72	291.99	1.86	2.47	10.08
Total for all causes	1,515.50	8.17	18.30	42.56	1,251.08	5.74	15.56	35.84	1,276.83	5.57	20.11	40.29
Enteric fever, including typho-malarial fever	7.41	.45	.....	1.24	10.77	1.20	.....	1.45	3.40	.31	.....	.54
Other specific contagious and infectious diseases, including erysipelas and tonsillitis	157.87	.15	.....	4.35	141.93	.48	.....	2.64	178.15	.62	.....	3.53
Other diseases of the digestive system, excluding hernia	72.73	.30	.15	1.43	64.14	.....	.....	1.49	93.41	.31	.62	1.93
Hernia	2.42	.....	.91	.22	.72	.....	.24	.25	.62	.....	.62	.07
Total for disease, excluding hernia	1,272.19	5.90	15.27	35.75	1,006.70	3.35	12.92	27.87	984.22	3.71	17.01	30.14
Total for injuries, including hernia	343.31	2.27	3.03	6.81	244.37	2.39	2.63	7.97	292.61	1.86	3.09	10.15

TABLE XI.—*The rates per 1,000 of strength, of admission, death, discharge and non-effectiveness of the U. S. Army, etc.*—Continued.

Names of armies or departments.	Department of the Platte.				Department of Texas.				Department of Arizona.			
Mean strength (corrected for time).	3,571.				1,481.				2,430.			
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Constantly non-effective.	Admissions.	Deaths.	Discharges.	Constantly non-effective.	Admissions.	Deaths.	Discharges.	Constantly non-effective.
Enteric fever	2.52	.56	.....	.37	6.75	1.35	.....	.89	7.00	.41	.....	.99
Other specific contagious and infectious diseases, including erysipelas	69.45	.....	.....	1.63	121.53	.68	.....	4.44	46.91	.....	.....	1.35
Malarial fevers and resulting conditions	25.20	.....	.....	.62	117.48	.....	.....	5.90	31.27	.....	.....	1.15
Typho-malarial fever	.....	.....	.....	.....	.....	.....	.....	.....	.41	.....	.....	.11
Diarrhea, including cholera morbus	78.41	.....	.....	.55	158.67	.....	.....	1.61	109.46	.....	.....	1.03
Dysentery	3.36	.....	.....	.04	4.05	.....	.....	.09	3.70	.....	.....	.21
Other miasmatic diseases	.....	.28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gonorrhea and results	33.88	.....	.....	1.66	38.49	.....	1.35	3.14	36.21	.....	.41	1.82
Syphilis and results	9.24	.....	.84	.99	26.33	.....	2.03	2.82	16.87	.....	3.29	1.40
Other venereal diseases	14.84	.....	.....	.88	41.19	.....	.....	2.05	13.17	.....	.....	1.16
Vaccina	17.36	.....	.....	.30	18.23	.....	.....	.39	30.04	.....	.....	.67
Other enthetic diseases	.28	.....	.....	.01	8.78	.....	.....	.21	2.06	.....	.....	.13
Alcoholism	43.40	.....	.....	.59	28.36	.....	.....	.32	30.04	.....	.....	.32
Other dietic diseases	.84	.....	.....	.02	.....	.....	.....	.....	.82	.....	.....	.03
Rheumatism (including muscular)	76.73	.....	.28	2.76	54.70	.....	1.35	2.99	100.82	.....	1.23	3.92
Other constitutional diseases	3.08	.28	.84	.52	2.70	.....	.68	.50	3.70	.....	.41	.37
Developmental diseases	.28	.....	.56	.04	.68	.....	1.35	.04	1.23	.....	.41	.16
Parasitic diseases	.84	.....	.....	.01	3.38	.....	.....	.13	2.88	.....	.....	.08
Headache and neuralgia	29.68	.....	.....	.47	36.46	.....	.68	.61	46.09	.....	.....	.67
Other diseases of the nervous system	5.04	.28	.28	.27	13.50	1.35	.68	1.59	9.88	.82	.82	.97
Diseases of the eye	18.20	.....	.84	.50	20.26	.....	1.35	.78	22.22	.....	1.23	.66
Diseases of the ear	6.16	.....	.56	.33	8.10	.....	.68	.42	6.58	.....	.....	.13
Catarrhs and common colds	36.68	.....	.....	.44	12.15	.....	.....	.09	20.16	.....	.....	.23
Bronchitis	60.77	.....	.....	1.03	60.77	.....	.....	1.04	84.77	.....	1.23	1.86
Pneumonia	3.08	.28	.....	.24	2.70	.68	.....	.20	5.35	1.65	.....	.40
Pulmonary phthisis	5.88	.56	2.80	1.00	4.73	1.35	2.03	1.58	4.94	1.23	2.06	2.80
Pleuritis	.56	.....	.....	.04	1.35	.....	.....	.06	4.11	.82	.....	.17
Other diseases of the respiratory system	4.48	.....	.....	.22	4.73	.....	.68	.11	7.41	.....	.....	.10
Diseases of the heart and valves	4.48	1.12	.84	.33	3.38	.....	1.35	.44	6.17	.....	1.65	.57
Other diseases of the circulatory system	1.40	.28	.....	.31	2.70	.....	1.35	.22	1.65	.....	.....	.02
Tonsillitis	58.81	.....	.....	.89	19.58	.....	.....	.32	46.50	.....	.....	.68
Dyspepsia, colic, and constipation	39.48	.....	.....	.45	70.22	.....	.68	1.13	81.89	.....	.....	.85
Other diseases of the digestive system	63.29	.....	.84	1.61	72.25	1.35	3.38	3.53	72.02	.41	1.23	1.94
Diseases of the kidneys	.56	.....	.....	.20	.68	.....	.....	.01	1.65	.....	.41	.11
Other diseases of the genito-urinary system (nonvenereal)	12.60	.....	.56	.54	16.20	.....	.68	.66	16.05	.....	.41	1.02
Diseases of the locomotor system (excluding muscular rheumatism)	8.40	.....	.28	.66	5.40	.....	2.03	.43	6.58	.....	3.29	.68
Diseases of the integumentary system	68.04	.....	.28	1.79	133.03	.....	.....	2.87	69.96	.....	1.23	2.52
All other diseases	25.76	.....	.....	.87	56.72	.68	2.03	2.00	25.10	.41	.....	.92
Heat stroke	1.96	.....	.....	.02	2.70	.....	.....	.03	1.23	.....	.....	.02
Frostbite and general freezing	6.72	.....	.28	.33	.....	.....	.....	.....	.41	.....	.....	.30
Contusions and sprains	128.53	.....	.....	2.99	133.03	.....	.....	4.00	139.50	.....	.....	3.59
Dislocations	3.36	.....	.28	.12	4.73	.....	.....	.25	2.47	.....	.41	.25
Fractures (not gunshot)	9.24	.....	.56	1.67	10.80	.68	.68	2.64	3.70	.41	.....	.76
Incised, lacerated, contused, and punctured wounds	50.69	.....	.28	1.63	64.82	.....	.68	1.85	69.55	.....	.....	1.84
Shot wounds	5.60	1.96	.56	.80	4.73	2.70	.68	.53	4.11	.82	1.23	.96
All other injuries	40.05	.56	.56	1.00	63.47	.68	1.35	1.36	54.73	1.23	.82	1.63
Total for disease	833.10	3.64	9.80	23.17	1,176.24	7.43	24.31	43.59	975.72	5.76	19.34	32.20
Total for injuries	246.15	2.52	2.52	8.57	284.27	4.05	3.38	10.66	275.72	2.47	2.47	9.35
Total for all causes	1,079.25	6.16	12.32	31.73	1,460.50	11.48	27.68	54.25	1,251.44	8.23	21.81	41.5

TABLE XI.—*The rates per 1,000 of strength, of admission, death, discharge and non-effectiveness of the U. S. Army, etc.*—Continued.

Names of armies or departments.	Department of the Platte.				Department of Texas.				Department of Arizona.			
Mean strength (corrected for time).	3,571.				1,481.				2,430.			
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Constantly non-effective.	Admissions.	Deaths.	Discharges.	Constantly non-effective.	Admissions.	Deaths.	Discharges.	Constantly non-effective.
Enteric fever, including typho-malarial fever	2.52	.56	.....	.37	6.75	1.35	.....	.89	7.41	.41	.....	1.10
Other specific contagious and infectious diseases, including erysipelas and tonsillitis.	128.26	.28	.....	2.52	141.11	.68	.....	4.76	93.41	.....	.....	2.03
Other diseases of the digestive system, excluding hernia	59.37	.....	.....	1.27	69.55	1.35	.68	3.02	69.96	.41	.....	1.71
Hernia	3.92	.....	.84	.34	2.70	.....	2.70	.51	2.06	.....	1.23	.23
Total for disease, excluding hernia	829.18	3.64	8.96	22.83	1,173.54	7.43	21.61	43.08	973.66	5.76	18.11	31.97
Total for injuries, including hernia	250.07	2.52	3.36	8.91	286.97	4.05	6.08	11.17	277.78	2.47	3.70	9.58

TABLE XI.—*The rates per 1,000 of strength, of admission, death, discharge and noneffectiveness of the U. S. Army, etc.*—Continued.

Names of armies or departments.	Department of California.				Department of the Columbia.			
Mean strength (corrected for time).	1,300.				1,364.			
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Constantly non-effective.	Admissions.	Deaths.	Discharges.	Constantly non-effective.
Enteric fever	.....	.....	.....	.....	6.60	.....	.....	1.28
Other specific contagious and infectious diseases, including erysipelas	50.00	.....	.....	1.18	45.45	.....	.....	.97
Malarial fevers and resulting conditions	26.15	.....	.....	.82	21.26	.....	.....	1.44
Typho-malarial fever	.....	.....	.....	.....	.....	.....	.....	.....
Diarrhea, including cholera morbus	42.31	.....	.....	.51	37.39	.....	.....	.33
Dysentery	.77	.....	.....	.01	.....	.....	.....	.....
Other miasmatic diseases	.....	.....	.....	.....	.....	.....	.....	.....
Gonorrhea and results	55.38	.....	.77	3.95	20.53	.....	.....	.88
Syphilis and results	10.00	.....	1.54	1.18	4.40	.....	.....	.66
Other venereal diseases	26.15	.....	.....	1.18	10.26	.....	.....	.48
Vaccina	28.46	.....	.....	.61	21.26	.....	.....	.50
Other enthetic diseases	2.31	.....	.....	.06	2.20	.....	.....	.10
Alcoholism	21.54	.....	.....	.22	30.06	.....	.....	.33
Other dietic diseases	2.31	.....	.....	.09	.73	.....	.....	.10
Rheumatism (including muscular)	53.07	.....	1.54	2.06	45.45	.....	1.47	2.10
Other constitutional diseases	4.62	.....	.77	.19	.73	.....	.....	.11
Developmental diseases	.77	.....	.....	.03	.....	.....	.....	.....
Parasitic diseases	2.31	.....	.....	.07	1.47	.....	.....	.03
Headache and neuralgia	28.46	.....	.....	.53	13.93	.....	.....	.39
Other diseases of the nervous system	10.77	.....	.....	1.25	7.33	.73	.73	.36
Diseases of the eye	19.23	.....	.77	.64	16.86	.....	2.93	.90
Diseases of the ear	9.23	.....	.77	.43	3.67	.....	.....	.07
Catarrhs and common colds	21.54	.....	.....	.19	.....	.....	.....	.....
Bronchitis	75.38	.....	.....	1.86	68.91	.....	.73	1.37
Pneumonia	.77	.....	.....	.14	5.13	1.47	.73	.61
Pulmonary phthisis	4.62	.77	3.08	.76	2.93	.....	1.47	.54
Pleuritis	1.54	.....	.....	.09	.73	.....	.....	.03
Other diseases of the respiratory system	4.62	.....	.77	.38	6.60	.....	.....	.14
Diseases of the heart and valves	5.38	.77	.77	.14	6.60	.....	3.67	.78
Other diseases of the circulatory system	.77	.....	.....	.09	.73	.....	.....	.44
Tonsillitis	13.08	.....	.....	.21	21.99	.....	.....	.41
Dyspepsia, colic, and constipation	39.23	.....	.....	.38	50.59	.....	.....	.44
Other diseases of the digestive system	40.77	.....	.....	.63	37.39	.....	2.20	1.42
Diseases of the kidneys	1.54	.....	.....	.47	.73	.73	.....	.01
Other diseases of the genito-urinary system (nonvenereal)	13.08	.....	2.31	.68	11.73	.....	.....	.62
Diseases of the locomotor system (excluding muscular rheumatism)	3.85	.....	.77	.41	6.60	.....	1.47	.80
Diseases of the integumentary system	69.23	.....	.....	1.98	49.12	.....	.....	1.33
All other diseases	17.69	.....	1.54	1.05	13.93	.....	.....	1.13
Heat stroke	.....	.....	.....	.....	4.40	.....	.....	.09
Frostbite and general freezing	.....	.....	.....	.....	.....	.....	.....	.....
Contusions and sprains	140.00	.....	.....	3.39	95.31	.....	.73	2.34
Dislocations	5.38	.....	.....	.35	.73	.....	.....	.20
Fractures (not gunshot)	6.15	.....	.....	1.27	7.33	.....	1.47	1.92
Incised, lacerated, contused, and punctured wounds	50.00	.....	.....	1.63	55.72	.....	.....	1.50
Shot wounds	.77	.77	.....	.05	.73	.....	.....	.004
All other injuries	43.85	1.54	.77	1.01	35.19	.73	.73	.68
Total for disease	706.92	1.54	15.38	24.46	573.31	2.93	15.40	21.14
Total for injuries	246.15	2.31	.77	7.70	199.41	.73	2.93	6.74
Total for all causes	953.08	3.85	16.15	32.16	772.73	3.67	18.33	27.88

TABLE XI.—*The rates per 1,000 of strength, of admission, death, discharge and noneffectiveness of the U. S. Army, etc.*—Continued.

Names of armies or departments.	Department of California.				Department of the Columbia.			
Mean strength (corrected for time).	1,300.				1,364.			
Causes of admission to sick report.	Admissions.	Deaths.	Discharges.	Constantly noneffective.	Admissions.	Deaths.	Discharges.	Constantly noneffective.
Enteric fever, including typho-malarial fever	.....	.....	.....	.....	6.60	.....	.....	1.28
Other specific contagious and infectious diseases, including erysipelas and tonsillitis	63.08	.....	.....	1.39	67.44	.....	.....	1.38
Other diseases of the digestive system, excluding hernia	39.23	.....	.....	.62	35.19	.....	.73	1.34
Hernia	1.54	.....	.....	.01	2.20	.....	1.47	.08
Total for disease, excluding hernia	705.38	1.54	15.38	24.45	571.11	2.93	13.93	21.06
Total for injuries, including hernia	247.69	2.31	.77	7.71	201.61	.73	4.40	6.82

TABLE XII.—*Comparison of the prevalence of specific febrile and acute diseases in various armies.*

Diseases.	United States.			Austria-Hungary, 1891.	Great Britain, 1890.	Italy, 1891.	Prussia, Saxony, Württemberg, 1889–1890.
	1892.	1891.	1881–1890.				
Cerebro-spinal fever	.08	.09	.09	.....	.....	.09	.05
Chicken pox	.54	.69	.10	.....	.04	.11	.02
Cholera	.....	.....	.....	.....	.....	.....	.01
Diphtheria	.45	.21	.37	.13	.06	.11	.79
Enteric fever	5.95	3.95	5.42	4.32	1.26	5.63	4.37
Influenza	74.08	132.67	20.68	3.81	65.76	.14	108.76
Measles	7.73	7.74	3.39	1.71	1.09	8.23	.72
Mumps	6.16	2.58	3.93	1.24	.81	3.94	(*)
Scarlet fever	.37	.13	.19	.29	2.43	.74	.77
Smallpox	.04	.22	.10	.18	.....	.41	.77
Varioloid	.....	.09	.01	.....	2.62	.....	.....
Typhus fever	.....	.....	.07	.04	.....	.02	.01
Whooping cough	.25	.09	.10	.....	.....	.....	.....
Yellow fever	.....	.....	.16	.....	.....	.....	.....
Tonsillitis	41.90	41.73	50.91	42.82	(*)	12.44	49.91

* Not enumerated separately.

TABLE XIII.—*Distribution of specific febrile diseases, etc., at United States military posts during the year 1892.*

Posts.	Specific febrile and acute infectious diseases, excluding influenza, erysipelas, and tonsillitis.								
	Cerebro-spinal fever.	Chicken pox.	Dengue.	Diphtheria.	Enteric fever, including typho-malarial fever.	Measles.	Mumps.	Scarlet fever.	Smallpox.
Columbus Barracks, Ohio					1	52	43		
Fort McIntosh, Tex		1	43		3				
Fort Yates, N. Dak					8	6	19		
Fort Monroe, Va					6	13	10		
Fort Sam Houston, Tex			21		1	2			
Fort Reno, Okla					23				
Fort Logan, Colo					1	8	10	2	
Madison Barracks, N. Y					19				
Fort Thomas, Ky					2	14	1		
Fort Leavenworth, Kans					12		2		
Jefferson Barracks, Mo					2	7	5		
Fort McPherson, Ga					4	2	8		
Fort McKinney, Wyo							11		
San Carlos, Ariz					10		1		
West Point, N. Y				1		10			
Davids Island, N. Y					4	6			
Fort Keogh, Mont		1			1	7	1		
Fort Riley, Kans		2			1	6		1	
Fort Grant, Ariz				6	2				
Fort Sheridan, Ill					2	2	5		
Fort Columbus, N. Y		2			1		5		
Fort Myer, Va					4			4	
Fort Sill, Okla					3	4			
Fort Bliss, Tex						6			
Jackson Barracks, La							6		
Camp Pilot Butte, Wyo					3	3			
Fort Wayne, Mich	1						5		
Fort Wingate, N. Mex						6			
Fort Douglas, Utah				1	2	2			
Fort Niobrara, Nebr				1		3	1		
Fort Omaha, Nebr						5			
Presidio of San Francisco, Cal						2	3		
Fort Sherman, Idaho					5				
Angel Island, Cal						1	2		
Fort Clark, Tex					4				
Fort Custer, Mont									
Fort D. A. Russell, Wyo						4			
Mount Vernon Barracks, Ala		3			1				
Benicia Barracks, Cal						3			
Fort Marcy, N. Mex					2				1
Fort Robinson, Nebr					2		1		
Fort Snelling, Minn						1	2		
Fort Warren, Mass						3			
Fort Apache, Ariz					3				
Fort Adams, R. I					1	1			
Fort Assinniboine, Mont		1			1				
Chicago, Ill					1		1		
Camp at Eagle Pass, Tex					1			1	
Fort Hamilton, N. Y						2			
Fort McHenry, Md					1		1		
Plattsburg Barracks, N. Y									
Fort Walla Walla, Wash					2				
Field, Department of California		1					1		
Field, Department of the East						2			
Field, Department of the Missouri					1		1		
Fort Bayard, N. Mex		1							
Boise Barracks, Idaho					1				
Fort Buford, N. Dak							1		
Columbia Arsenal, Tenn							1		
A. & N. G. H. Hot Springs, Ark						1			
Leavenworth Prison, Kans	1								
Fort Meade, S. Dak				1					
Fort Missoula, Mont							1		
Newport Barracks, Ky					1				
Fort Niagara, N. Y					1				
Camp Oklahoma, Okla						1			
Fort Randall, S. Dak						1			

TABLE XIII.—*Distribution of specific febrile diseases, etc., at United States military posts during the year 1892*—Continued.

Posts.	Specific febrile and acute infectious diseases, (excluding influenza, erysipelas, and tonsillitis).								
	Cerebro-spinal fever.	Chicken pox.	Dengue.	Diphtheria.	Enteric fever (including typho-malarial fever).	Measles.	Mumps.	Scarlet fever.	Smallpox.
Fort Ringgold, Tex					1				
San Diego Barracks, Cal					1				
Fort Stanton, N. Mex				1					
Fort Trumbull, Conn					1				
Fort Washakie, Wyo		1							
Watervliet Arsenal, N. Y					1				
Fort Wood, N. Y								1	
Fort Yellowstone, Wyo						1			
Field, Department of the Columbia					1				
Field, Department of Dakota					1				
Field, Department of the Platte					1				
Field, Department of Texas							1		
Washington Barracks, D. C					1				
Fort Supply, Ind. T									
Fort Sully, S. Dak									
Vancouver Barracks, Wash									
Willets Point, N. Y									
St. Francis Barracks, Fla									
Fort Barrancas, Fla									
Camp Poplar River, Mont									
Rock Island Arsenal, Ill									
Fort Preble, Me									
Fort Du Chesne, Utah									
Fort Bidwell, Cal									
Fort Mackinac, Mich									
Fort Wadsworth, N. Y									
Whipple Barracks, Ariz									
Sandy Hook, N. J									
Allegheny Arsenal, Pa									
Fort Brown, Tex									
Fort Canby, Wash									
Indianapolis Arsenal, Ind									
Augusta Arsenal, Ga									
Kennebec Arsenal, Me									
Watertown Arsenal, Mass									
Alcatraz Island, Cal									
Frankford Arsenal, Pa									
San Antonio, Tex									
Fort Bowie, Ariz									
Camp Pena Colorado, Tex									
Fort Townsend, Wash									
Fort Brady, Mich									
Fort Sidney, Nebr									
Fort Porter, N. Y									
Fort Ontario, N. Y									
Fort Huachuca, Ariz									
Fort Hancock, Tex									
Fort Gaston, Cal									
Fort Mason, Cal									
Fort Pembina, N. Dak									
Fort Spokane, Wash									
Field, Department of Arizona									
Total	2	13	64	11	151	187	149	9	1
Admission rates per 1,000 of mean strength	.08	.54	2.64	.45	6.24	7.73	6.16	.37	.04

TABLE XIII.—*Distribution of specific febrile diseases, etc., at United States military posts during the year 1892.*—Continued.

Posts.	Specific febrile and acute infectious diseases, excluding influenza, erysipelas, and tonsillitis.				Influenza.	Erysipelas.	Tonsillitis.	Aggregate.	Ratio per 1,000 of mean strength.
	Whooping cough.	Other infectious diseases.	Total.	Ratio per 1,000 of mean strength.					
Columbus Barracks, Ohio	.....	.....	96	162.44	45	1	52	194	328.26
Fort McIntosh, Tex	.....	.....	47	315.44	.....	.....	.....	47	315.44
Fort Yates, N. Dak	.....	.....	33	127.41	.....	1	8	42	162.16
Fort Monroe, Va	1	.....	30	80.00	44	1	19	94	250.67
Fort Sam Houston, Tex	.....	.....	24	56.21	43	.....	10	77	180.33
Fort Reno, Okla	.....	.....	23	72.78	58	1	6	88	278.48
Fort Logan, Colo	.....	.....	21	63.25	2	2	31	56	168.67
Madison Barracks, N. Y	.....	.....	19	57.06	.....	.....	5	24	72.07
Fort Thomas, Ky	.....	.....	17	63.43	4	.....	13	34	126.87
Fort Leavenworth, Kans	.....	2	16	22.35	20	1	42	79	110.34
Jefferson Barracks, Mo	.....	.....	14	27.67	.....	1	21	36	71.15
Fort McPherson, Ga	.....	.....	14	35.09	82	.....	24	120	300.75
Fort McKinney, Wyo	.....	.....	11	40.74	34	1	25	71	262.96
San Carlos, Ariz	.....	.....	11	65.87	.....	.....	5	16	95.81
West Point, N. Y	.....	.....	11	29.33	52	.....	19	82	218.67
Davids Island, N. Y	.....	.....	10	18.02	3	.....	25	38	68.47
Fort Keogh, Mont	.....	.....	10	25.91	32	1	9	52	134.71
Fort Riley, Kans	.....	.....	10	14.58	.....	1	34	45	65.60
Fort Grant, Ariz	.....	1	9	31.47	23	.....	7	39	136.36
Fort Sheridan, Ill	.....	.....	9	17.08	78	1	7	95	180.27
Fort Columbus, N. Y	.....	.....	8	32.79	5	.....	7	20	81.97
Fort Myer, Va	.....	.....	8	33.90	12	.....	7	27	114.41
Fort Sill, Okla	.....	.....	7	20.23	8	.....	17	32	92.49
Fort Bliss, Tex	.....	.....	6	56.07	3	2	4	15	140.19
Jackson Barracks, La	.....	.....	6	56.61	2	.....	4	12	113.21
Camp Pilot Butte, Wyo	.....	.....	6	125.00	1	.....	4	11	229.17
Fort Wayne, Mich	.....	.....	6	25.75	38	.....	15	59	253.22
Fort Wingate, N. Mex	.....	.....	6	16.76	.....	.....	22	28	78.21
Fort Douglas, Utah	.....	.....	5	10.31	17	2	35	59	121.65
Fort Niobrara, Nebr	.....	.....	5	14.88	39	.....	11	55	163.69
Fort Omaha, Nebr	.....	.....	5	10.35	12	.....	13	30	62.11
Presidio of San Francisco, Cal	.....	.....	5	10.75	31	1	6	43	92.47
Fort Sherman, Idaho	.....	.....	5	21.55	6	.....	7	18	77.58
Angel Island, Cal	1	.....	4	14.49	5	1	3	13	47.10
Fort Clark, Tex	.....	.....	4	12.46	12	.....	8	24	74.77
Fort Custer, Mont	4	.....	4	10.13	141	.....	13	158	400.00
Fort D. A. Russell, Wyo	.....	.....	4	9.32	.....	1	30	35	81.59
Mount Vernon Barracks, Ala	.....	.....	4	22.10	46	.....	8	58	320.44
Benicia Barracks, Cal	.....	.....	3	22.73	.....	.....	3	6	45.46
Fort Marcy, N. Mex	.....	.....	3	24.39	1	.....	13	17	138.21
Fort Robinson, Nebr	.....	.....	3	8.60	45	.....	9	57	163.32
Fort Snelling, Minn	.....	.....	3	7.28	4	.....	30	37	89.81
Fort Warren, Mass	.....	.....	3	26.09	2	.....	1	6	52.14
Fort Apache, Ariz	.....	.....	3	15.23	1	.....	10	14	241.97
Fort Adams, R. I	.....	.....	2	8.06	34	.....	24	60	71.01
Fort Assiniboine, Mont	.....	.....	2	4.36	101	1	8	112	244.07
Chicago, Ill	.....	.....	2	38.46	.....	.....	.....	2	38.46
Camp at Eagle Pass, Tex	.....	.....	2	37.74	21	.....	1	24	452.83
Fort Hamilton, N. Y	.....	.....	2	7.63	24	.....	38	64	244.27
Fort McHenry, Md	.....	.....	2	12.50	11	.....	5	18	112.50
Plattsburg Barracks, N. Y	.....	2	2	32.79	5	.....	1	8	131.15
Fort Walla Walla, Wash	.....	.....	2	9.80	15	.....	13	30	147.06
Field, Department of California	.....	.....	2	18.18	.....	.....	.....	2	18.18
Field, Department of the East	.....	.....	2	46.51	.....	.....	.....	2	46.51
Field, Department of the Missouri	.....	.....	2	37.04	.....	.....	.....	2	37.04
Fort Bayard, N. Mex	.....	.....	1	3.36	58	.....	41	100	335.57
Boise Barracks, Idaho	.....	.....	1	10.20	4	.....	.....	5	51.02
Fort Buford, N. Dak	.....	.....	1	4.69	51	.....	5	57	267.61
Columbia Arsenal, Tenn	.....	.....	1	52.63	4	.....	1	6	315.79
A. & N. G. H. Hot Springs, Ark	.....	.....	1	30.30	.....	.....	.....	1	30.30
Leavenworth Prison, Kans	.....	.....	1	8.70	.....	.....	3	4	34.78
Fort Meade, S. Dak	.....	.....	1	2.42	.....	4	41	46	111.38
Fort Missoula, Mont	.....	.....	1	5.29	.....	.....	4	5	26.46
Newport Barracks, Ky	.....	.....	1	16.67	3	.....	4	8	133.33
Fort Niagara, N. Y	.....	.....	1	5.32	8	.....	5	14	74.47
Camp Oklahoma, Okla	.....	.....	1	25.64	3	.....	1	5	128.21
Fort Randall, S. Dak	.....	.....	1	10.31	15	.....	.....	16	164.95

TABLE XIII.—*Distribution of specific febrile diseases, etc., at United States military posts during the year 1892*—Continued.

Posts.	Specific febrile and acute infectious diseases (excluding influenza, erysipelas, and tonsillitis).				Influenza.	Erysipelas.	Tonsillitis.	Aggregate.	Ratio per 1,000 of mean strength.
	Whooping cough.	Other infectious diseases.	Total.	Ratios per 1,000 of mean strength.					
Fort Ringgold, Tex	.....	.....	1	7.46	16	.....	1	18	134.33
San Diego Barracks, Cal	.....	.....	1	14.49	.....	.....	1	2	28.99
Fort Stanton, N. Mex	.....	.....	1	8.93	4	.....	2	7	62.50
Fort Trumbull, Conn	.....	.....	1	16.13	12	.....	.....	13	209.68
Fort Washakie, Wyo	.....	.....	1	6.45	11	.....	8	20	129.03
Watervliet Arsenal, N. Y	.....	.....	1	18.18	5	.....	7	13	236.36
Fort Wood, N. Y	.....	.....	1	18.52	.....	.....	3	4	74.07
Fort Yellowstone, Wyo	.....	.....	1	13.16	.....	.....	2	3	39.47
Field, Department of the Columbia	.....	.....	1	8.47	.....	.....	.....	1	8.47
Field, Department of Dakota	.....	.....	1	8.40	3	.....	4	8	67.23
Field, Department of the Platte	.....	.....	1	3.18	.....	.....	7	8	25.48
Field, Department of Texas	.....	.....	1	10.20	.....	.....	.....	1	10.20
Washington Barracks, D. C	.....	.....	1	3.01	18	1	5	25	75.30
Fort Supply, Ind. T	.....	.....	.....	.....	142	.....	6	148	554.31
Fort Sully, S. Dak	.....	.....	.....	.....	32	1	12	45	255.68
Vancouver Barracks, Wash	.....	.....	.....	.....	31	.....	8	39	95.82
Willets Point, N. Y	.....	.....	.....	.....	26	.....	7	33	87.77
St. Francis Barracks, Fla	.....	.....	.....	.....	21	.....	1	22	178.86
Fort Barrancas, Fla	.....	.....	.....	.....	18	.....	1	19	253.33
Camp Poplar River, Mont	.....	.....	.....	.....	18	.....	3	21	216.49
Rock Island Arsenal, Ill	.....	.....	.....	.....	17	.....	2	19	292.32
Fort Preble, Me	.....	.....	.....	.....	16	.....	4	20	350.88
Fort Du Chesne, Utah	.....	.....	.....	.....	12	.....	4	16	115.11
Fort Bidwell, Cal	.....	.....	.....	.....	11	.....	.....	11	192.98
Fort Mackinac, Mich	.....	.....	.....	.....	8	.....	6	14	122.80
Fort Wadsworth, N. Y	.....	.....	.....	.....	8	.....	1	9	51.43
Whipple Barracks, Ariz	.....	.....	.....	.....	8	.....	4	12	62.50
Sandy Hook, N. J	.....	.....	.....	.....	7	.....	2	9	173.08
Allegheny Arsenal, Pa	.....	.....	.....	.....	6	.....	1	7	218.75
Fort Brown, Tex	.....	.....	.....	.....	5	.....	.....	5	84.75
Fort Canby, Wash	.....	.....	.....	.....	5	.....	.....	5	47.17
Indianapolis Arsenal, Ind	.....	.....	.....	.....	5	.....	1	6	240.00
Augusta Arsenal, Ga	.....	.....	.....	.....	4	.....	.....	4	148.15
Kennebec Arsenal, Me	.....	.....	.....	.....	4	.....	.....	4	266.67
Watertown Arsenal, Mass	.....	.....	.....	.....	3	.....	2	5	161.29
Alcatraz Island, Cal	.....	.....	.....	.....	2	.....	3	5	42.74
Frankford Arsenal, Pa	.....	.....	.....	.....	2	.....	.....	2	50.00
San Antonio, Tex	.....	.....	.....	.....	2	.....	.....	2	58.82
Fort Bowie, Ariz	.....	.....	.....	.....	1	1	4	6	44.12
Camp Pena Colorado, Tex	.....	.....	.....	.....	1	.....	3	4	81.63
Fort Townsend, Wash	.....	.....	.....	.....	1	.....	1	2	31.25
Fort Brady, Mich	.....	.....	.....	.....	.....	1	3	4	34.19
Fort Sidney, Nebr	.....	.....	.....	.....	.....	.....	33	33	246.27
Fort Porter, N. Y	.....	.....	.....	.....	.....	.....	11	11	104.76
Fort Ontario, N. Y	.....	.....	.....	.....	.....	.....	4	4	65.57
Fort Huachuca, Ariz	.....	.....	.....	.....	.....	.....	3	3	9.43
Fort Hancock, Tex	.....	.....	.....	.....	.....	.....	2	2	40.00
Fort Gaston, Cal	.....	.....	.....	.....	.....	.....	1	1	31.25
Fort Mason, Cal	.....	.....	.....	.....	.....	.....	1	1	17.24
Fort Pembina, N. Dak	.....	.....	.....	.....	.....	.....	1	1	25.64
Fort Spokane, Wash	.....	.....	.....	.....	.....	.....	1	1	7.41
Field, Department of Arizona	.....	.....	.....	.....	.....	.....	1	1	6.49
Total	6	5	598	.....	17.93	28	1,014	3,433	141.84
Admission rates per 1,000 of mean strength	.25	.21	24.71	.....	78.98	1.16	41.90	.....	.....

TABLE XIV.—*Distribution of pneumonia at United States military posts during the year 1892.*

[Cases of pneumonia, complications of other diseases not included.]

Names of posts.	Admissions.				Dispositions.				Lobar pneumonia.					Catarrhal pneumonia.					Undefined type.	
	Total.	White.	Colored.	Indian.	Duty.	Deaths.	Otherwise.	Remaining.	Right side.	Left side.	Both sides.	Total.	Deaths from.	Right side.	Left side.	Both sides.	Total.	Deaths from.	Cases.	Deaths from.
Columbus Barracks, Ohio	10	10	...	...	6	4	...	...	5	4	1*	10	4	...	...	...	...	...	...	...
Jefferson Barracks, Mo	5	5	...	...	5	...	...	...	2	...	...	2	...	2	...	1	3	...	...	...
Whipple Barracks, Ariz	5	5	...	...	3	2	...	...	4	...	1	5	2	...	...	...	...	...	...	...
Fort Assinniboine, Mont	4	4	...	...	3	1	...	...	2	1	1	4	1	...	...	...	...	...	...	...
Fort Buford, N. Dak	4	...	4	...	...	...	...	4	4	...	...	4	...	...	...	...	...	...	...	...
Fort Leavenworth, Kans	3	3	...	...	3	...	...	...	...	2	1	3	...	...	...	...	...	...	...	...
Fort Bayard, N. Mex	2	...	2	...	1	1	...	...	...	2	...	2	1	...	...	...	...	...	...	...
Fort Bliss, Tex	2	2	...	...	1	1	...	...	...	1	1	2	1	...	...	...	...	...	...	...
Fort Clark, Tex	2	2	...	...	2	...	...	...	1	1	...	2	...	...	...	...	...	...	...	...
Fort D. A. Russell, Wyo	2	2	...	...	1	...	...	1	1	1	...	2	...	...	...	...	...	...	...	...
Davids Island, N. Y	2	2	...	...	1	...	...	1	1	1	...	2	...	...	...	...	...	...	...	...
Fort Keogh, Mont	2	1	1	...	2	...	...	...	2	...	...	2	...	...	...	...	...	...	...	...
Fort McHenry, Md	2	2	...	...	1	...	...	1	...	1	...	1	...	...	...	1	1	...	...	...
Fort McKinney, Wyo	2	2	...	...	2	...	...	...	...	2	...	2	...	...	...	...	...	...	...	...
Fort Monroe, Va	2	2	...	...	2	...	...	...	...	1	...	1	...	...	...	...	...	...	1	...
Fort Niobrara, Nebr	2	...	...	2	1	...	1	...	1	1	...	2	...	...	...	...	...	...	...	...
Fort Omaha, Nebr	2	1	...	1	1	1	...	...	...	...	2	2	1	...	...	...	...	...	...	...
Fort Reno, Okla	2	2	...	...	1	*1	1	...	...	...	1	1	...	...	...	1	1	...	...	*1
San Diego Barracks, Cal	2	2	...	...	2	...	...	...	1	1	...	2	...	...	...	...	...	...	...	...
Fort Sidney, Nebr	2	2	...	...	2	...	...	...	...	...	2	2	...	...	...	...	...	...	...	...
Fort Spokane, Wash	2	2	...	...	...	...	1	1	2	...	...	2	...	...	...	...	...	...	...	...
Fort Walla Walla, Wash	2	2	...	...	1	1	...	...	1	...	1	2	1	...	...	...	...	...	...	...
Fort Yates, N. Dak	2	2	...	...	2	...	...	...	1	...	...	1	...	1	...	...	1	...	...	...
Fort Adams, R. I	1	1	...	...	...	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...
Fort Bowie, Ariz	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	1
Fort Columbus, N. Y	1	1	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...
Fort Grant, Ariz	1	1	...	...	1	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...
Fort Logan, Colo	1	1	...	...	1	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...
Fort Marcy, N. Mex	1	1	...	...	1	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...
Fort McPherson, Ga	1	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...
Presidio of San Francisco, Cal	1	1	...	...	1	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Fort Riley, Kans	1	1	...	...	1	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...
San Carlos, Ariz	1	1	...	...	...	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...
Fort Sherman, Idaho	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...
Fort Sill, Okla	1	1	...	...	1	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...
Fort Snelling, Minn	1	1	...	...	...	1	...	...	1	...	...	1	1	...	...	...	...	...	...	...
Vancouver Barracks, Wash	1	1	...	...	...	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...
Fort Wadsworth, N. Y	1	1	...	...	...	1	...	...	...	...	...	...	...	1	...	...	1	1	...	...
Willets Point, N. Y	1	1	...	...	1	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...
Field and at large	2	1	1	...	1	†2	...	...	1	...	1	2	1	...	...	...	...	...	...	*1
Total	83	72	8	3	52	*2 15	4	12	35	23	12	70	13	5	1	4	10	1	3	*2 1

* Not on sick report. † Including 1 not on sick report.

TABLE XV.—*Twenty posts giving the highest admission rates for malarial diseases, rheumatism, diarrheal and venereal diseases, respectively, during 1892.*

I.—MALARIAL DISEASES.

Names of stations.	Mean strength.	Ratios per 1,000 of mean strength.			
		Admissions.	Deaths.	Discharges for disability.	Constantly nonefective.
Washington Barracks, D. C	332	563.25	.....	.....	7.32
Fort Sill, Okla	346	474.00	.....	.....	8.87
Fort Myer, Va	236	466.11	.....	.....	6.46
Mount Vernon Barracks, Ala	181	270.70	.....	5.52	4.77
Fort Reno, Okla	316	265.82	.....	.....	8.23
Fort Hamilton, N. Y	262	221.38	.....	.....	2.86
Fort Clark, Tex	321	205.61	.....	.....	15.00
Jefferson Barracks, Mo	506	193.69	.....	.....	5.16
Fort Wadsworth, N. Y	175	171.42	.....	.....	1.72
Fort Barrancas, Fla	75	146.67	.....	.....	8.45
Jackson Barracks, La	106	141.50	.....	.....	3.51
Fort Sam Houston, Tex	427	98.36	.....	.....	3.38
Fort Omaha, Nebr	483	95.24	.....	.....	2.96
Fort Riley, Kans	686	94.75	.....	.....	3.15
Fort Marcy, N. Mex	123	81.30	.....	.....	3.02
Fort Washakie, Wyo	155	77.42	.....	.....	1.57
Fort Monroe, Va	375	77.33	.....	.....	1.60
Fort McIntosh, Tex	149	73.82	.....	.....	2.16
St. Francis Barracks, Fla	123	73.17	.....	.....	2.07
Fort Supply, Ind. T	267	71.16	.....	.....	1.30
The Army	24,203	63.75	.....	.04	1.76

II.—RHEUMATISM.

[Muscular and articular.]

Fort Marcy, N. Mex	123	195.12	.....	8.13	1.78
Fort Canby, Wash	106	169.81	.....	9.43	11.93
Fort Robinson, Nebr	349	166.18	.....	.....	3.98
St. Francis Barracks, Fla	123	162.60	.....	.....	3.02
Fort Bowie, Ariz	136	154.41	.....	.....	9.76
Fort Snelling, Minn	412	143.20	.....	2.43	9.10
San Carlos, Ariz	167	125.75	.....	.....	3.17
Fort Barrancas, Fla	75	120.00	.....	.....	9.94
Fort Sully, S. Dak	176	113.64	.....	.....	5.45
Fort Bayard, N. Mex	298	110.74	.....	.....	8.79
West Point, N. Y	375	109.33	.....	.....	2.93
Fort Custer, Mont	395	106.33	.....	5.06	3.80
Fort Mackinac, Mich	114	105.27	.....	.....	2.40
Fort Apache, Ariz	197	101.52	.....	.....	4.52
Fort Monroe, Va	375	101.33	.....	.....	3.93
Fort McKinney, Wyo	270	96.30	.....	.....	4.16
Fort Du Chesne, Utah	139	93.53	.....	.....	3.52
Columbus Barracks, Ohio	591	93.06	.....	.....	4.94
Fort Schuyler, N. Y	98	91.84	.....	.....	1.81
Fort Reno, Okla	316	91.77	.....	.....	3.09
The Army	24,203	71.52	.04	1.41	3.32

III.—DIARRHEAL DISEASES.

Fort Monroe, Va	375	389.33	.....	.....	3.24
Fort Hamilton, N. Y	262	381.68	.....	.....	3.28
Davids Island, N. Y	555	257.66	.....	.....	1.95
Fort Barrancas, Fla	75	253.33	.....	.....	9.14
St. Francis Barracks, Fla	123	252.03	.....	.....	1.89
Fort Sam Houston, Tex	427	248.24	.....	.....	2.93
Fort Clark, Tex	321	218.08	.....	.....	2.25
San Carlos, Ariz	167	215.57	.....	.....	3.45
Fort Schuyler, N. Y	98	214.28	.....	.....	1.31
Fort Supply, Ind. T	267	202.25	.....	.....	1.69
Fort Yates, N. Dak	259	200.76	.....	.....	2.90
Madison Barracks, N. Y	333	180.18	.....	.....	1.63
Willets Point, N. Y	376	175.53	.....	.....	1.66
Fort Stanton, N. Mex	112	169.64	.....	.....	1.34

TABLE XV.—*Twenty posts giving the highest admission rates for malarial diseases, rheumatism, diarrheal, and venereal diseases, respectively, during 1892*—Continued.

III.—DIARRHEAL DISEASES.

Names of stations.	Mean strength.	Ratior per 1,000 of mean strength.			
		Admissions.	Deaths.	Discharges for disability.	Constantly noneffective.
Fort Marcy, N. Mex	123	162.60	.....	.....	2.53
Fort Snelling, Minn	412	160.19	.....	.....	.97
Fort Wingate, N. Mex	358	159.21	.....	.....	1.06
Fort McPherson, Ga	399	142.85	.....	.....	1.97
Fort Reno, Okla	316	142.40	.....	.....	1.32
Fort Apache, Ariz	197	142.13	.....	.....	1.87
The Army	24,203	110.84	.....	.04	1.31

IV.—VENEREAL DISEASES.

Columbus Barracks, Ohio	591	292.72	.....	1.69	18.54
Fort Ringgold, Tex	134	208.97	.....	.....	9.63
Jackson Barracks, La	106	198.11	.....	18.87	12.16
Fort McPherson, Ga	399	195.48	.....	.....	13.67
Fort Porter, N. Y	105	171.42	.....	.....	10.27
Fort McHenry, Md	160	168.75	.....	12.50	11.84
Fort McIntosh, Tex	149	167.78	.....	.....	15.47
Washington Barracks, D. C	332	156.61	.....	9.04	9.69
San Carlos, Ariz	167	149.70	.....	5.99	7.61
Fort Omaha, Nebr	483	140.79	.....	2.07	7.52
Fort Bliss, Tex	107	140.19	.....	.....	9.64
Fort Wayne, Mich	233	137.34	.....	.....	11.71
Jefferson Barracks, Mo	506	136.37	.....	1.98	9.49
Fort Schuyler, N. Y	98	132.66	.....	.....	6.03
Angel Island, Cal	276	130.44	.....	7.24	8.75
Fort Marcy, N. Mex	123	130.08	.....	.....	5.11
Alcatraz Island, Cal	117	128.21	.....	8.55	10.21
Fort Thomas, Ky	268	119.41	.....	3.73	8.89
Fort Adams, R. I	248	116.93	.....	.....	10.97
Fort Clark, Tex	321	115.27	.....	9.35	8.25
The Army	24,203	76.72	.....	1.97	5.32

TABLE XVI.—*Twenty posts giving the highest noneffective rates for malarial diseases, rheumatism, diarrheal and venereal diseases, respectively, during 1892.*

I.—MALARIAL DISEASES.

Names of stations.	Mean strength.	Constantly noneffective per 1,000 of mean strength.	Average number sick daily.	Average number of days each case was treated.
Fort Clark, Tex	321	15.00	4.81	26.70
Fort Sill, Okla	346	8.87	3.07	6.85
Fort Ringgold, Tex	134	8.69	1.16	71.00
Fort Barrancas, Fla	75	8.45	.63	21.91
Fort Reno, Okla	316	8.23	2.60	11.33
Washington Barracks, D. C	332	7.32	2.43	4.75
Fort Myer, Va	236	6.46	1.52	5.16
Jefferson Barracks, Mo	506	5.16	2.61	9.76
Mount Vernon Barracks, Ala	181	4.77	.86	6.45
Jackson Barracks, La	106	3.51	.37	9.07
Fort Sam Houston, Tex	427	3.38	1.44	12.57
Fort Riley, Kans	686	3.15	2.16	12.15
Vancouver Barracks, Wash	407	3.11	1.27	27.29
Fort Apache, Ariz	197	3.06	.60	15.78
Fort Marcy, N. Mex	123	3.02	.37	13.60
Fort Omaha, Nebr	483	2.96	1.43	11.39
Fort Hamilton, N. Y	262	2.86	.75	4.72
Boise Barracks, Idaho	98	2.31	.23	20.75
Fort McIntosh, Tex	149	2.16	.32	10.73
San Carlos, Ariz	167	2 14	.36	14.56
The Army	24,203	1.76	42.65	10.12

TABLE XVI.—*Twenty posts giving the highest noneffective rates for malarial diseases, rheumatism, diarrheal and venereal diseases, respectively, during 1892*—Continued.

II.—RHEUMATISM.

Names of stations.	Mean strength.	Constantly noneffective per 1,000 of mean strength.	Average number sick daily.	Average number of days each case was treated.
Fort Canby, Wash	106	11.93	1.26	25.72
Fort Barrancas, Fla	75	9.94	.75	30.33
Fort Bowie, Ariz	136	9.76	1.33	23.14
Fort Snelling, Minn	412	9.10	3.75	23.25
Fort Bayard, N. Mex	298	8.79	2.62	29.06
Fort Yates, N. Dak	259	6.60	1.71	32.95
Fort Sully, S. Dak	176	5.45	.96	17.55
Madison Barracks, N. Y	333	5.18	1.72	37.12
Columbus Barracks, Ohio	591	4.94	2.92	19.42
Fort Apache, Ariz	197	4.52	.89	16.30
Fort Grant, Ariz	286	4.35	1.24	17.50
Fort McKinney, Wyo	270	4.16	1.12	15.81
Fort Thomas, Ky	268	4.15	1.11	18.50
Fort Sidney, Nebr	134	4.00	.54	32.67
Fort Robinson, Nebr	349	3.98	1.39	8.76
Fort Monroe, Va	375	3.93	1.48	14.21
Fort Sam Houston, Tex	427	3.83	1.63	23.00
Fort Custer, Mont	395	3.80	1.50	13.07
Fort Assinniboine, Mont	459	3.70	1.70	18.82
Fort Logan, Colo	332	3.52	1.17	26.75
The Army	24,203	3.32	80.39	17.00

III.—DIARRHEAL DISEASES.

Fort Barrancas, Fla	75	9.14	.69	13.21
San Carlos, Ariz	167	3.45	.58	5.86
Fort Hamilton, N. Y	262	3.28	.86	3.15
Fort Monroe, Va	375	3.24	1.22	3.05
Fort Sam Houston, Tex	427	2.93	1.25	4.32
Fort Yates, N. Dak	259	2.90	.75	5.29
Fort Marcy, N. Mex	123	2.53	.31	5.70
Fort Clark, Tex	321	2.25	.72	3.77
Fort McPherson, Ga	399	1.97	.79	5.05
Davids Island, N. Y	555	1.95	1.08	2.78
St. Francis Barracks, Fla	123	1.89	.23	2.74
Fort Apache, Ariz	197	1.87	.27	4.82
Fort Sill, Okla	346	1.74	.60	5.52
Fort Yellowstone, Wyo	76	1.73	.13	4.80
Fort Meade, S. Dak	413	1.71	.70	4.96
Fort Assinniboine, Mont	459	1.70	.78	7.33
Fort Supply, Ind. T	267	1.69	.45	3.06
Willets Point, N. Y	376	1.66	.62	3.45
Fort McHenry, Md	160	1.64	.26	5.65
Madison Barracks, N. Y	333	1.63	.54	3.32
The Army	24,203	1.13	43.81	5.98

IV.—VENEREAL DISEASES.

Columbus Barracks, Ohio	591	18.54	10.95	23.17
Fort McIntosh, Tex	149	15.47	2.31	33.76
Fort McPherson, Ga	399	13.67	5.46	25.60
Jackson Barracks, La	106	12.16	1.29	22.48
Fort McHenry, Md	160	11.84	1.89	25.67
Fort Wayne, Mich	233	11.71	2.73	31.22
Fort Custer, Mont	395	11.05	4.37	38.96
Fort Adams, R. I	248	10.97	2.72	34.35
Fort Porter, N. Y	105	10.27	1.08	21.94
Alcatraz Island, Cal	117	10.21	1.19	29.13
Washington Barracks, D. C	332	9.69	3.22	22.65
Fort Bliss, Tex	107	9.64	1.03	25.20
Fort Ringgold, Tex	134	9.63	1.29	16.86
Jefferson Barracks, Mo	506	9.49	4.80	25.46
Leavenworth Prison, Kans	115	9.48	1.09	66.50
Fort Thomas, Ky	268	8.89	2.38	27.25
Angel Island, Cal	276	8.75	2.42	24.56
Fort Monroe, Va	375	8.51	3.19	32.44
Fort Clark, Tex	321	8.25	2.65	26.19
Fort Bayard, N. Mex	298	7.84	2.34	42.75
The Army	24,203	5.32	128.96	25.42

TABLE XVII.—*Prevalence of alcoholism at the various posts and its influence on the effective force of the garrisons for the year 1892.*

Names of stations.	Mean strength.	Ratio per 1,000 of mean strength.		Names of stations.	Mean strength.	Ratio per 1,000 of mean strength.	
		Admissions.	Constantly noneffective.			Admissions.	Constantly noneffective.
Fort Brady, Mich	117	179.49	2.08	Fort Sheridan, Ill	527	34.15	.28
Jackson Barracks, La	106	179.23	2.99	Fort Sully, S. Dak	176	34.09	.17
Fort Porter, N. Y	105	171.42	1.87	Fort Meade, S. Dak	413	33.90	.92
Willets Point, N. Y	376	159.57	2.03	Benicia Barracks, Cal	132	30.30	.37
Rock Island Arsenal, Ill	65	153.85	3.28	Fort Supply, Ind. T	267	29.96	.32
Fort Ontario, N. Y	61	131.15	1.12	Fort Du Chesne, Utah	139	28.78	.12
Camp Oklahoma, Okla	39	128.20	.63	Fort Robinson, Nebr	349	28.65	.23
Fort McPherson, Ga	399	127.82	1.61	Fort Stanton, N. Mex	112	26.79	.17
Fort Marcy, N. Mex	123	113.82	.98	Fort Leavenworth, Kans	716	26.54	.33
Fort Barrancas, Fla	75	106.67	.87	Fort Yellowstone, Wyo	76	26.31	.32
Fort Niobrara, Nebr	336	95.24	1.09	Fort Assinniboine, Mont	459	26.14	.29
St. Francis Barracks, Fla	123	73.17	.62	Alcatraz Island, Cal	117	25.64	.40
Fort Keogh, Mont	386	69.95	.79	Fort Columbus, N. Y	244	24.59	.31
Fort Logan, Colo	332	69.27	1.75	Angel Island, Cal	276	21.74	.25
Fort Mason, Cal	58	68.97	.33	Fort Monroe, Va	375	21.33	.22
Fort Omaha, Nebr	483	68.33	.89	Fort Missoula, Mont	189	21.16	.29
Fort Ringgold, Tex	134	67.17	.84	Camp Pilot Butte, Wyo	48	20.83	.46
Plattsburg Barracks, N. Y	61	65.57	.40	Fort Randall, S. Dak	97	20.62	.08
Madison Barracks, N. Y	333	63.06	.65	Fort Adams, R. I	248	20.16	.22
Whipple Barracks, Ariz	192	62.50	.68	Fort Hancock, Tex	50	20.00	.05
Fort Townsend, Wash	64	62.50	.60	Fort Riley, Kans	686	18.95	.32
Fort Mackinac, Mich	114	61.40	.60	Fort Preble, Me	57	17.54	.67
Fort Warren, Mass	115	60.87	.47	Presidio of San Francisco, Cal	465	17.20	.15
Leavenworth Prison, Kans	115	60.87	.47	Fort Brown, Tex	59	16.95	.09
Washington Barracks, D. C	332	60.24	.79	Columbus Barracks, Ohio	591	16.92	.15
Fort Bowie, Ariz	136	58.83	.38	Newport Barracks, Ky	60	16.67	.18
Benicia Arsenal, Cal	53	56.60	.52	Fort Clark, Tex	321	15.58	.13
Fort Canby, Wash	106	56.60	.28	Fort Apache, Ariz	197	15.23	.08
Mount Vernon Barracks, Ala	181	55.25	.39	Fort Sidney, Nebr	134	14.93	.51
Fort McKinney, Wyo	270	51.85	.67	Fort D. A. Russel, Wyo	429	13.99	.22
Fort Sam Houston, Tex	427	51.52	.67	Fort Grant, Ariz	286	13.99	.12
Fort Wadsworth, N. Y	175	51.43	.50	Fort Bayard, N. Mex	298	13.42	.10
Fort Schuyler, N. Y	98	51.02	1.06	Fort Sherman, Idaho	232	12.93	.33
Fort Trumbull, Conn	62	48.39	.35	Camp Poplar River, Mont	97	10.31	.08
Fort Niagara, N. Y	188	47.87	.39	Boise Barracks, Idaho	98	10.20	.06
Fort Wayne, Mich	233	47.21	.46	Fort Reno, Okla	316	9.49	.10
Fort Douglas, Utah	485	45.36	.41	Fort Custer, Mont	395	7.59	.50
Vancouver Barracks, Wash	407	44.23	.54	Fort Thomas, Ky	268	7.46	.04
Fort McHenry, Md	160	43.75	.39	Fort Spokane, Wash	135	7.41	.02
Fort Hamilton, N. Y	262	41.98	.38	Fort Washakie, Wyo	155	6.45	.21
Camp Pena Colorado, Tex	49	40.82	.33	Jefferson Barracks, Mo	506	3.95	.02
Fort Wingate, N. Mex	358	39.11	.64	West Point, N. Y	375	2.67	.03
Fort Snelling, Minn	412	38.84	.68	Field, Department of the Platte	314	15.92	.10
Fort Yates, N. Dak	259	38.61	.45	Field, Department of the Columbia	118	8.47	.05
Fort Myer, Va	236	38.14	.36				
Davids Island, N. Y	555	37.84	.26				
Camp at Eagle Pass, Tex	53	37.74	.15				
Fort Huachuca, Ariz	318	34.59	.47	The Army	24,203	37.23	.45
Fort Walla Walla, Wash	204	34.31	.32				

TABLE XVIII.—*The relation of certain classes of disease to the several arms of the*

[Annual rates for the period of three

Orders of diseases.	Total.	Arms of service.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other.
Total specific febrile and acute infectious diseases, including erysipelas.									
Admissions:									
Officers	162.19	179.84	182.34	256.05	67.23	25.32	134.92	.....	45.35
Enlisted men	142.42	138.14	163.89	159.29	198.96	204.31	109.33	98.24	49.61
Total	143.59	140.44	164.79	165.41	186.81	174.87	113.30	98.24	49.01
Noneffectiveness:									
Officers	6.49	6.50	8.25	11.96	1.96	1.00	4.27	.....	1.62
Enlisted men	3.47	3.48	3.69	3.50	6.10	3.49	2.60	3.49	1.19
Total	3.65	3.64	3.91	4.04	5.72	3.08	2.86	3.49	1.25
Deaths:									
Officers	.94	1.18	1.57	.....	.....	.....	.....	.....	1.63
Enlisted men	1.05	1.32	1.02	.97	.78	.....	.89	.....	1.07
Total	1.04	1.31	1.05	.89	.69	.....	.71	.....	1.17
Discharges:									
Enlisted men	.08	.03	.....	.....	.78	.....	.....	.....	.....
Malarial diseases.									
Admissions:									
Officers	45.26	49.25	73.40	54.99	8.40	4.22	34.39	.....	.....
Enlisted men	74.91	59.55	101.07	107.46	69.17	58.97	37.42	66.37	28.52
Total	73.11	58.98	99.74	104.06	63.57	49.97	36.95	66.37	24.50
Noneffectiveness:									
Officers	2.09	1.58	2.85	2.06	.12	.09	6.95	.....	.....
Enlisted men	2.05	1.87	2.54	2.56	1.22	.91	.95	2.10	.81
Total	2.05	1.85	2.57	2.53	1.12	.78	1.88	2.10	.69
Deaths:									
Officers	.16	.....	.79	.....	.....	.....	.....	.....	.....
Enlisted men	.08	.15	.05	.....	.....	.....	.....	.....	.....
Total	.09	.14	.10	.....	.....	.....	.....	.....	.....
Discharges:									
Enlisted men	.12	.12	.05	.11	.....	.....	.44	.37	.....
Typho-malarial fever.									
Admissions:									
Enlisted men	.31	.34	.23	.36	.....	.....	.49	.40	.39
Total	.29	.32	.22	.33	.....	.....	.41	.40	.34
Noneffectiveness:									
Enlisted men	.05	.04	.06	.06	.....	.....	.07	.08	.08
Total	.05	.04	.05	.06	.....	.....	.06	.08	.07
Deaths:									
Enlisted men	.04	.06	.05	.....	.....	.....	.....	.....	.....
Total	.04	.06	.05	.....	.....	.....	.....	.....	.....
Diarrheal diseases.									
Admissions:									
Officers	55.62	62.43	72.25	84.19	42.02	29.54	23.81	.....	2.39
Enlisted men	118.33	111.20	131.20	172.67	146.03	218.43	35.47	69.19	39.45
Total	114.54	108.49	128.14	166.95	136.43	187.37	33.66	69.19	34.24
Noneffectiveness:									
Officers	1.17	1.32	1.13	2.51	.39	.81	.25	.....	.02
Enlisted men	1.33	1.17	1.62	1.96	2.56	1.73	.35	.75	.41
Total	1.32	1.18	1.59	2.00	2.36	1.57	.33	.75	.35
Deaths:									
Officers	.16	.89	.....	.....	.....	.....	.....	.....	.....
Enlisted men	.01	.....	.05	.....	.....	.....	.....	.....	.....
Total	.02	.03	.05	.....	.....	.....	.....	.....	.....
Discharges:									
Enlisted men	.12	.09	.21	.11	.....	.....	.44	.....	.....
Septic diseases (excluding erysipelas).									
Admissions:									
Officers	.23	.....	.....	.....	.....	.....	2.65	.....	.....
Enlisted men	.09	.13	.....	.....	.....	.....	.....	.....	.78
Total	.10	.13	.....	.....	.....	.....	.41	.....	.67
Noneffectiveness:									
Officers	.06	.....	.....	.....	.....	.....	.30	.....	.....
Enlisted men	.001	.002	.....	.....	.....	.....	.....	.....	.01
Total	.003	.002	.....	.....	.....	.....	.05	.....	.01
Deaths:									
Enlisted men	.01	.....	.05	.....	.....	.....	.....	.....	.....
Total	.01	.....	.05	.....	.....	.....	.....	.....	.....

Service and ages of individuals, expressed in ratios per 1,000 of their mean strengths.

years ending December 31, 1892.]

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	163.64	189.20	172.84	179.88	150.79	182.63	142.39	93.29	95.65
161.43	170.94	141.48	122.25	122.75	128.74	107.63	97.70	106.73	265.31
161.43	170.84	143.12	124.88	128.28	130.84	119.61	116.13	97.89	146.34
.....	6.53	8.64	6.41	6.50	5.34	5.58	6.56	4.77	7.97
4.80	4.49	3.29	2.71	2.60	3.03	2.96	2.55	3.80	11.84
4.80	4.51	3.48	2.90	2.98	3.25	3.38	4.20	4.44	9.13
.....	.....	.97	1.06	1.04	1.36	.....	.....	2.00	5.95
1.69	1.02	1.19	1.08	.....	1.35	1.26	1.05	5.13	.....
1.69	1.01	1.18	1.08	.13	1.35	1.00	.54	2.87	4.50
.....	.....	.05	.08	.....	.....	.....	.....	.....	.....
.....	31.82	78.23	49.38	36.58	25.79	45.21	34.37	55.39	8.70
82.01	100.79	78.64	55.84	54.01	50.36	50.20	33.33	22.47	.....
82.01	100.03	78.64	55.50	52.32	48.00	49.41	33.76	44.15	6.10
.....	.52	3.05	2.79	2.69	2.37	1.49	1.15	1.55	.29
1.74	2.95	2.14	1.47	1.38	1.07	1.03	1.10	1.95	.....
1.74	2.93	2.17	1.55	1.51	1.19	1.10	1.12	1.69	.20
.....	.....	.97	.....	.....	.....	.....	.....	.....	.....
.....	.14	.09	.....	.15	.....	.....	.....	.....	.....
.....	.14	.13	.....	.13	.....	.....	.....	.....	.....
.84	.19	.09	.....	.....	.19	.....	1.05	.....	.....
.92	.46	.30	.25	.16	.21	.....	.....	.....	.....
.92	.45	.29	.24	.15	.19	.....	.....	.....	.....
.09	.09	.04	.04	.03	.05	.....	.....	.....	.....
.09	.09	.04	.03	.03	.04	.....	.....	.....	.....
.84	.05	.05	.....	.....	.....	.....	.....	.....	.....
.84	.05	.04	.....	.....	.....	.....	.....	.....	.....
.....	54.55	69.70	47.84	41.16	81.35	45.21	67.11	43.73	17.39
127.30	144.18	120.65	96.11	101.64	95.45	85.28	120.69	123.59	163.27
127.30	143.18	118.93	93.60	95.77	94.09	78.87	98.58	71.02	60.98
.....	.49	2.87	.57	.35	1.24	.47	.77	2.72	.76
.95	1.45	1.19	1.26	1.42	1.28	1.29	2.39	3.00	8.16
.95	1.44	1.25	1.23	1.32	1.28	1.16	1.72	2.82	2.97
.....	.....	.....	.....	.....	.....	.....	.....	2.00	.....
.....	.....	.05	.....	.....	.....	.....	.....	.....	.....
.....	.....	.04	.....	.....	.....	.....	.....	1.44	.....
.....	.14	.05	.08	.60	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	2.92	.....
.....	.05	.15	.....	.16	.21	.....	.....	.....	.....
.....	.05	.15	.....	.15	.19	.....	.....	1.92	.....
.....	.....	.....	.....	.....	.....	.....	.....	.33	.....
.....	.001	.002	.....	.004	.003	.....	.....	.....	.....
.....	.001	.002	.....	.004	.003	.....	.....	.22	.....
.....	.....	.....	.....	.....	.19	.....	.....	.....	.....
.....	.....	.....	.....	.....	17	.....	.....	.....	.....

TABLE XVIII.—*The relation of certain classes of disease to the*

Orders of diseases.	Total.	Arms of service.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other.
Venereal diseases.									
Admissions:									
Officers	5.05	5.15	8.03	8.59	.....	.....	2.65	.....	.....
Enlisted men	79.34	72.93	74.67	112.42	16.22	60.63	16.04	153.72	20.70
Total	74.83	69.17	71.44	105.73	14.73	50.66	13.96	153.72	17.79
Noneffectiveness:									
Officers	.50	.25	1.19	.15	.....	.....	1.59	.....	.....
Enlisted men	5.36	4.91	5.13	7.93	1.07	4.92	.86	9.23	1.98
Total	5.07	4.66	4.94	7.43	.97	4.11	.98	9.23	1.70
Deaths:									
Officers	.16	.....	.....	.....	.....	.....	1.81	.....	.....
Total	.01	.....	.....	.....	.....	.....	.36	.....	.....
Discharges:									
Enlisted men	2.31	1.93	1.71	3.03	.....	1.52	1.78	7.38	.36
Zoögenous diseases.									
Admissions:									
Officers	1.61	2.29	1.15	1.72	.....	.....	2.65	.....	.....
Enlisted men	51.27	34.02	25.42	41.54	5.98	67.28	5.34	311.27	3.91
Total	48.25	32.26	24.24	38.97	5.43	56.21	4.93	311.27	3.36
Noneffectiveness:									
Officers	.02	.04	.01	.01	.....	.....	.07	.....	.....
Enlisted men	1.59	.99	.56	1.63	.07	1.45	.09	10.50	.07
Total	1.51	.94	.53	1.53	.06	1.21	.09	10.50	.06
Deaths:									
Enlisted men	.01	.....	.....	.11	.....	.....	.....	.....	.....
Total	.01	.....	.....	.10	.....	.....	.....	.....	.....
Discharges:									
Enlisted men	.03	.03	.....	.11	.....	.....	.....	.....	.....
Dietic diseases.									
Admissions:									
Officers	7.12	8.02	18.35	1.72	.....	.....	.....	.....	.....
Enlisted men	42.13	54.33	22.61	56.33	36.72	147.01	21.87	5.85	23.44
Total	40.01	51.76	22.40	52.81	33.33	122.83	18.47	5.85	20.14
Noneffectiveness:									
Officers	.12	.15	.27	.03	.....	.....	.....	.....	.....
Enlisted men	.51	.63	.30	.70	.50	1.84	.24	.07	.30
Total	.48	.60	.30	.65	.46	1.54	.21	.07	.25
Deaths:									
Officers	.16	.....	.79	.....	.....	.....	.....	.....	.....
Enlisted men	.18	.28	.11	.22	.....	.....	.....	.....	.....
Total	.17	.26	.15	.20	.....	.....	.....	.....	.....
Discharges:									
Enlisted men	.19	.21	.21	.22	.....	.....	.44	.....	.....
Constitutional diseases (including muscular rheumatism).									
Admissions:									
Officers	78.79	106.53	72.25	106.52	25.21	4.22	37.04	.....	33.41
Enlisted men	81.20	80.70	96.88	82.49	121.26	124.58	57.84	41.56	35.16
Total	81.05	82.12	95.68	84.03	112.40	104.79	54.19	41.56	34.91
Noneffectiveness:									
Officers	7.31	10.41	8.26	6.65	2.23	.02	1.40	.....	4.19
Enlisted men	3.95	4.05	4.57	4.17	4.36	3.55	3.28	2.32	1.56
Total	4.15	4.40	4.75	4.33	4.16	2.97	2.99	2.32	1.93
Deaths:									
Officers	.31	.....	.....	1.18	.....	.....	.....	.....	1.63
Enlisted men	.18	.15	.11	.22	.78	.....	.44	.....	.71
Total	.19	.14	.10	.30	.69	.....	.36	.....	.88
Discharges:									
Enlisted men	2.08	2.11	2.30	2.60	3.90	1.52	1.78	.92	.36
Developmental diseases.									
Admissions:									
Officers	.46	.57	.....	1.72	.....	.....	.....	.....	.....
Enlisted men	.52	.54	.47	1.07	.....	.....	.....	.40	.....
Total	.52	.54	.44	1.11	.....	.....	.....	.40	.....
Noneffectiveness:									
Officers	.44	.36	.....	2.22	.....	.....	.....	.....	.....
Enlisted men	.05	.04	.04	.14	.....	.....	.....	.04	.....
Total	.07	.06	.04	.27	.....	.....	.....	.04	.....
Discharges:									
Enlisted men	.80	.86	.53	1.84	.....	.....	.....	.....	1.43

several arms of the service and ages of individuals, etc.—Continued.

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	36.36	9.96	7.72	1.52	.....	.....	1.64	.....	.....
121.77	135.77	87.28	47.38	25.04	13.27	8.25	3.45	.....	.....
121.77	134.67	84.65	45.32	22.76	12.00	6.93	2.70	.....	.....
.....	3.66	.81	.20	.92	.....	.....	.09	.....	.....
6.93	8.72	5.95	3.53	2.24	1.19	.83	.16	.....	.....
6.93	8.66	5.78	3.36	2.12	1.08	.69	.13	.....	.....
.....	.....	.....	.....	1.04	.....	.....	.....	.....	.....
.....	.....	.....	.....	.13	.....	.....	.....	.....	.....
20.25	3.58	2.20	.77	1.20	.39	.31	.....	.....	.....
.....	4.55	7.11	1.54	.....	.....	.....	.....	.....	.....
166.04	111.36	39.05	16.50	10.15	5.48	4.13	9.20	5.62	20.41
166.04	110.18	37.96	15.72	9.16	4.95	3.47	5.40	1.92	6.10
.....	.12	.08	.03	.....	.....	.....	.....	.....	.....
4.07	3.53	1.22	.45	.38	.13	.12	.15	.22	.56
4.07	3.48	1.18	.43	.34	.12	.11	.09	.07	.17
.....	.....	.05	.....	.....	.....	.....	.....	.....	.....
.....	.....	.04	.....	.....	.....	.....	.....	.....	.....
.....	.05	.05	.....	.....	.....	.....	.....	.....	.....
.....	4.55	2.84	7.72	19.82	7.94	9.04	.....	2.92	.....
2.77	10.93	25.45	46.95	76.60	121.78	114.16	162.05	168.53	183.67
2.77	10.86	24.68	44.91	71.09	110.85	97.37	95.21	59.50	54.88
.....	.05	.01	.09	.34	.27	.11	.....	.04	.....
.05	.13	.26	.49	.82	1.65	1.81	2.26	2.40	3.80
.05	.13	.25	.47	.77	1.52	1.54	1.33	.85	1.14
.....	.....	.....	.....	.....	.....	1.24	.....	.....	.....
.....	.....	.09	.08	.....	.58	1.26	2.10	5.13	.....
.....	.....	.09	.07	.....	.51	1.25	1.09	1.44	.....
.....	.28	.14	.15	.15	.19	.31	.....	.....	.....
.....	50.00	35.56	66.35	36.59	107.14	110.30	129.30	102.03	95.65
44.28	69.52	69.66	73.86	99.02	119.47	131.35	201.15	320.22	142.85
44.28	69.30	68.51	73.47	92.96	118.29	128.00	171.51	176.58	109.75
.....	4.80	3.60	3.58	2.74	10.00	10.37	14.34	9.23	12.19
2.35	3.16	3.37	3.72	4.53	6.29	6.61	10.84	18.96	5.42
2.35	3.18	3.38	3.71	4.36	6.65	7.21	12.28	12.56	10.16
.....	.....	.....	.....	.....	.....	.....	4.12	.....	5.95
.....	.05	.05	.08	.45	.77	.63	1.05	.....	.....
.....	.05	.04	.07	.39	.68	.50	1.09	.....	4.50
.84	1.30	1.70	2.09	1.80	3.85	4.40	8.41	25.64	18.52
.....	.....	.....	.....	.....	.....	.....	.....	2.92	8.70
3.69	.61	.40	.....	.....	.42	.69	4.60	11.24	20.41
3.69	.60	.39	.....	.....	.38	.58	2.70	5.76	12.20
.....	.....	.....	.....	.....	.....	.....	.54	2.79	5.43
.46	.03	.03	.....	.....	.04	.02	.56	2.29	10.22
.46	.03	03	.....	.....	.04	.02	.55	2.62	6.86
4.22	.84	.32	.23	.....	.96	1.89	11.57	20.51	.....

TABLE XVIII.—*The relation of certain classes of disease to the*

Orders of diseases.	Total.	Arms of service.						
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other
Parasitic diseases.									
Admissions:									
Officers	1.15	2.29	.....	1.72	.....	.....	.....	.....	.....
Enlisted men	3.06	1.98	3.45	3.55	1.71	2.49	.97	10.09	.39
Total	2.94	1.99	3.28	3.43	1.55	2.08	.82	10.09	.34
Noneffectiveness:									
Officers	.05	.12	.....	.01	.....	.....	.....	.....	.....
Enlisted men	.08	.06	.08	.08	.02	.07	.01	.25	.01
Total	.08	.06	.08	.08	.01	.06	.01	.25	.01
Diseases of the nervous system.									
Admissions:									
Officers	64.56	86.49	57.34	60.14	33.61	4.22	87.30	.....	16.70
Enlisted men	54.22	51.34	60.18	68.76	58.92	72.26	31.10	46.20	23.44
Total	54.83	53.28	60.04	68.20	56.59	61.07	39.82	46.20	22.49
Noneffectiveness:									
Officers	6.00	7.24	4.65	4.97	.71	.15	14.39	.....	2.30
Enlisted men	1.52	1.68	1.44	1.67	1.39	1.52	1.27	1.36	1.11
Total	1.79	1.92	1.60	1.89	1.32	1.29	3.31	1.36	1.28
Deaths:									
Officers	2.52	3.92	.....	2.35	11.56	2,89	1.81	.....	.....
Enlisted men	.41	.40	.27	.43	1.56	.76	.44	.18	1.07
Total	.57	.65	.25	.59	2.75	1.20	.71	.18	.88
Discharges:									
Enlisted men	2.86	3.13	2.57	3.25	3.12	2.28	4.00	1.66	2.14
Diseases of the eye.									
Admissions:									
Officers	15.85	18.33	18.35	15.46	16.81	4.22	13.23	.....	9.55
Enlisted men	20.16	19.94	28.92	17.04	17.93	37.37	3.89	7.67	4.69
Total	19.90	19.85	28.41	16.94	17.83	31.92	5.34	7.67	5.37
Noneffectiveness:									
Officers	1.89	1.34	1.05	3.41	6.90	.43	1.93	.....	3.25
Enlisted men	.67	.76	.76	.57	.43	1.16	.32	.27	.33
Total	.75	.79	.77	.75	1.03	1.04	.57	.27	.74
Discharges:									
Enlisted men	1.21	1.52	1.23	.76	.78	.....	.89	.18	1.79
Diseases of the ear.									
Admissions:									
Officers	3.68	3.44	2.29	8.59	8.40	.....	5.29	.....	.....
Enlisted men	8.42	8.91	8.18	9.70	7.69	9.97	6.80	7.87	1.95
Total	8.13	8.61	7.89	9.63	7.75	8.33	6.57	7.87	1.68
Noneffectiveness:									
Officers	.17	.11	.01	.32	2.81	.....	.03	.....	.....
Enlisted men	.37	.47	.26	.25	.32	.50	.32	.47	.03
Total	.35	.45	.25	.25	.55	.42	.28	.47	.03
Discharges:									
Enlisted men	.60	.83	.53	.43	.....	.....	.89	.18	.....
Diseases of the nose.									
Admissions:									
Officers	3.45	5.15	5.73	1.72	.....	.....	.....	.....	.....
Enlisted men	1.94	2.31	1.64	1.78	1.71	9.14	.97	.40	.78
Total	2.04	2.47	1.83	1.77	1.55	7.63	.82	.40	.67
Noneffectiveness:									
Officers	.74	.66	2.36	.02	.....	.....	.....	.....	.....
Enlisted men	.10	.12	.09	.06	.12	.50	.03	.01	.07
Total	.14	.15	.20	.06	.11	.42	.02	.01	.06
Discharges:									
Enlisted men	.18	.18	.21	.22	.....	.....	.....	.....	.36
Diseases of the respiratory system.									
Admissions:									
Officers	130.03	158.07	149.08	199.30	67.23	12.66	50.27	.....	33.41
Enlisted men	124.17	117.24	134.27	156.09	198.97	171.92	38.87	121.24	50.00
Total	124.53	119.48	134.98	158.87	186.81	145.72	40.64	121.24	47.67

several arms of the service and ages of individuals, etc.—Continued.

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	.....	1.42	.....	1.52	5.95	.....	.....	.....	.....
5.53	4.48	3.26	2.28	1.47	1.26	1.72	.....	.....	.....
5.53	4.43	3.20	2.17	1.48	1.71	1.44	.....	.....	.....
.....	.....	.01	.....	.18	.17	.....	.....	.....	.....
.19	.14	.06	.06	.05	.01	.05	.....	.....	.....
.19	.13	.06	.06	.06	.03	.05	.....	.....	.....
.....	40.91	52.63	81.79	60.97	79.36	56.06	76.92	40.82	86.96
51.66	61.03	53.45	46.87	52.37	50.57	48.14	67.82	78.65	81.64
51.66	60.80	53.43	48.68	53.21	53.33	49.41	71.57	53.74	85.37
.....	2.80	2.24	6.48	4.62	8.62	7.35	7.36	9.52	4.52
.83	1.13	1.45	1.67	1.94	1.78	2.59	2.11	4.60	4.08
.83	1.15	1.47	1.92	2.20	2.43	3.35	4.28	7.84	4.39
.....	.....	.....	.....	2.09	1.36	3.72	6.73	7.98	.....
.....	.19	.23	.54	.30	.96	1.26	2.10	.....	18.52
.....	.18	.22	.50	.52	1.01	1.76	4.34	5.75	4.50
1.69	2.88	2.75	2.79	2.84	3.47	2.83	4.21	5.13	.....
.....	36.36	19.91	23.15	16.77	17.86	5.42	6.55	11.66	8.70
12.91	23.09	21.68	17.94	16.04	14.96	15.82	24.14	33.71	81.63
12.91	23.23	21.62	18.21	16.11	15.24	14.16	16.88	19.19	30.49
.....	1.53	1.20	3.77	1.77	1.57	.26	1.60	3.27	3.62
.20	.60	.69	.72	.46	.49	1.14	1.99	2.00	6.03
.20	.61	.71	.88	.59	.59	1.00	1.83	2.84	4.34
.....	.79	1.24	1.39	.90	1.16	2.52	6.31	5.13	.....
.....	.....	2.84	6.17	6.10	1.98	3.62	3.27	2.92	.....
10.15	11.19	8.03	6.35	7.53	6.74	5.16	4.60	16.85	20.41
10.15	11.06	7.85	6.34	7.39	6.29	4.91	4.05	7.68	6.10
.....	.....	.07	.30	.66	.01	.02	.04	.05	.....
.33	.53	.31	.30	.38	.23	.15	.05	.60	2.74
.33	.53	.30	.30	.40	.21	.13	.05	.24	.82
.....	.60	.50	.70	.75	.58	.31	.....	5.13	18.52
.....	.....	4.27	3.09	3.05	7.94	3.62	.....	2.92	8.70
3.69	2.49	2.01	1.69	.49	2.11	.34	3.45	5.62	.....
3.69	2.46	2.08	1.76	.74	2.67	.87	2.03	3.84	6.10
.....	.....	.44	2.33	.09	1.44	.50	.....	.47	1.62
.04	.13	.10	.08	.004	.14	.07	.19	.02	.....
.04	.13	.11	.20	.01	.26	.14	.11	.32	1.13
.....	.28	.09	.31	.....	.19	.....	.....	.....	.....
.....	122.72	100.99	108.03	112.81	142.85	179.03	165.29	119.53	95.65
146.67	140.61	118.29	114.37	112.27	116.31	114.52	137.93	191.01	122.44
146.67	140.40	117.72	114.04	112.33	118.85	124.82	149.22	143.95	103.66

TABLE XVIII.—*The relation of certain classes of disease to the*

Orders of diseases.	Total.	Arms of service.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other.
Diseases of the respiratory system—Cot'd.									
Noneffectiveness:									
Officers	5.47	5.00	8.26	5.54	6.67	.27	5.97	.....	3.70
Enlisted men	3.31	3.24	3.49	3.99	5.49	4.92	1.01	2.96	1.44
Total	3.44	3.33	3.72	4.09	5.60	4.15	1.78	2.96	1.75
Deaths:									
Officers	1.42	1.96	3.14	.....	.....	.....	.....	.....	.....
Enlisted men	1.41	1.38	1.34	.87	2.34	.....	2.22	2.03	2.50
Total	1.41	1.42	1.45	.79	2.06	.....	1.78	2.03	2.05
Discharges:									
Enlisted men	2.36	2.42	2.51	3.03	2.34	3.79	1.78	.92	1.07
Diseases of the circulatory system.									
Admissions:									
Officers	5.97	8.59	6.88	5.15	.....	.....	.....	.....	4.77
Enlisted men	6.81	7.64	6.25	8.05	8.54	10.80	3.40	2.82	4.69
Total	6.76	7.69	6.28	7.86	7.75	9.02	2.87	2.82	4.70
Noneffectiveness:									
Officers	1.91	2.72	3.20	1.00	.....	.....	.38	.....	.12
Enlisted men	.57	.66	.48	.66	.78	1.73	.18	.19	.30
Total	.65	.77	.62	.68	.71	1.45	.21	.19	.28
Deaths:									
Officers	.94	.78	.....	1.18	.....	.....	1.81	.....	3.27
Enlisted men	.41	.43	.37	.22	.78	.76	.....	.18	1.43
Total	.45	.45	.35	.30	.69	.60	.36	.18	1.76
Discharges:									
Enlisted men	1.78	2.02	1.28	3.03	3.12	1.52	.44	.55	1.07
Diseases of the digestive system.									
Admissions:									
Officers	142.89	173.53	169.73	183.84	67.23	29.54	84.66	.....	40.57
Enlisted men	173.94	168.31	204.63	186.03	175.91	253.31	71.92	158.37	67.58
Total	172.06	168.59	202.94	186.22	165.87	216.51	73.89	158.37	63.78
Noneffectiveness:									
Officers	7.20	7.76	10.06	4.46	.48	.50	10.51	.....	5.51
Enlisted men	2.98	2.86	3.45	3.38	2.72	3.79	1.54	2.80	1.17
Total	3.24	3.14	3.77	3.45	2.60	3.25	2.93	2.80	1.78
Deaths:									
Officers	1.89	1.96	.....	1.18	5.78	2.89	1.81	.....	4.90
Enlisted men	.33	.31	.32	.....	2.34	.76	.....	.18	1.07
Total	.45	.43	.30	.10	2.75	1.20	.36	.18	1.76
Discharges:									
Enlisted men	1.64	1.56	1.66	2.49	.....	1.52	1.78	1.48	.71
Diseases of the lymphatic system.									
Admissions:									
Officers	.92	1.72	.....	1.72	.....	.....	.....	.....	.....
Enlisted men	5.79	5.06	7.30	7.81	1.71	1.66	2.43	6.86	1.95
Total	5.49	4.88	6.95	7.42	1.55	1.39	2.05	6.86	1.68
Noneffectiveness:									
Officers	.03	.03	.....	.12	.....	.....	.....	.....	.....
Enlisted men	.50	.41	.62	.67	.55	.20	.10	.62	.24
Total	.47	.39	.59	.63	.50	.17	.08	.62	.21
Deaths:									
Enlisted men	.01	.03	.....	.....	.....	.....	.....	.....	.....
Total	.01	.03	.....	.....	.....	.....	.....	.....	.....
Discharges:									
Enlisted men	.10	.09	.11	.22	.....	.....	.....	.....	.....
Diseases of the genito-urinary system.									
Admissions:									
Officers	16.54	17.75	26.38	25.77	8.40	.....	2.65	.....	2.39
Enlisted men	15.85	15.38	17.53	17.51	18.79	14.95	10.69	17.15	5.47
Total	15.90	15.51	17.96	18.05	17.83	12.49	9.44	17.15	5.03
Noneffectiveness:									
Officers	2.09	1.31	5.23	3.45	.58	.....	.09	.....	.24
Enlisted men	.94	.94	1.19	.97	.60	.80	.34	.80	.28
Total	1.01	.96	1.38	1.14	.60	.66	.30	.80	.28

several arms of the service and ages of individuals, etc.—Continued.

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	1.65	3.90	2.94	2.72	7.47	7.33	12.16	3.46	5.17
3.50	3.21	3.12	3.14	3.93	3.86	3.41	3.10	7.75	5.53
3.50	3.19	3.14	3.13	3.82	4.20	4.04	6.83	4.93	5.27
.....	.....	.....	1.06	.....	5.44	1.24	1.12	3.99	.....
.84	1.07	1.15	1.24	1.50	2.50	3.14	3 15	10.26	18.52
.84	1.05	1.10	1.23	1.31	2.87	2.76	2.17	5.75	4.50
2.53	2.19	2.48	2.24	3.14	2.70	.94	2.10	5.13	.....
.....	.....	.....	3.09	4.57	3.97	9.04	13.09	11.66	17.39
3.69	6.97	6.17	5.16	5.07	10.53	12.72	16.09	11.24	.....
3.69	6.89	5.96	5.05	5.03	9.90	12.13	14.85	11.52	12.20
.....	.....	.....	.05	.95	1.14	2.65	5.94	4.77	3.00
.22	.53	.45	.46	.33	1.00	1.77	1.39	1.69	.....
.22	.53	.43	.44	.39	1.01	1.91	3.27	3.72	2.10
.....	.....	.....	.....	.....	.....	1.24	3.37	2.00	5.95
.....	.....	.09	.23	.75	1.73	2.83	2.10	.....	.....
.....	.....	.09	.22	.65	1.52	2.51	2.71	1.44	4.50
.....	1.77	1.33	1.47	1.35	3.28	3.14	7.36	10.26	.....
.....	100.00	156.47	152.77	131.10	123.01	159.12	155.48	128.28	139.13
257.39	226.05	172.75	141.79	130.61	129.58	114.16	119.53	134.83	20.41
257.39	224.65	172.21	142.35	130.65	128.95	121.35	134.37	130.52	103.65
.....	2.58	4.21	8.34	4.68	9.28	8.85	9.80	5.00	18.11
3.56	3.47	2.64	2.62	2.92	3.09	3.06	3.70	2.63	.17
3.56	3.46	2.69	2.92	3.09	3.68	3.99	6.22	4.19	12.75
.....	.....	.97	.....	.....	.....	2.48	3.37	3.99	23.81
.84	.09	.28	.31	.45	.58	.31	3.15	.....	18.52
.84	.09	.31	.29	.39	.51	.75	3.26	2.87	22.52
.84	1.49	1.47	1.93	1.65	2.12	1.57	3.15	5.13	.....
.....	.....	.....	6.17	.....	.....	.....	.....	.....	.....
7.38	7.58	6.78	5.16	2.78	3.37	.69	2.30	.....	.....
7.38	7.49	6.54	5.21	2.51	3.05	.59	1.35	.....	.....
.....	.....	.....	.19	.....	.....	.....	.....	.....	.....
.59	.69	.57	.42	.19	.34	.09	.07	.....	.....
.59	.68	.55	.41	.17	.30	.08	.04	.....	.....
.....	.05	.....	.....	.....	.....	.....	.....	.....	.....
.....	.05	.....	.....	.....	.....	.....	.....	.....	.....
.....	.09	.09	.15	.....	.19	.....	.....	.....	.....
.....	13.63	17.07	20.06	13.72	7.94	12.66	24.55	14.58	34.78
19.37	20.60	15.71	13.28	12.60	8.64	10.66	18.39	33.71	20.41
19.37	20.52	15.76	13.63	12.71	8.57	10.98	20.93	21.11	30.49
.....	1.39	2.36	2.17	3.20	.53	1.34	2.24	1.31	6.88
1.89	1.11	1.03	.66	.87	.65	.56	1.20	2.01	3.41
1.89	1.11	1.07	.73	1.09	.64	.68	1.63	1.55	5.84

TABLE XVIII.—*The relation of certain classes of disease to the*

Orders of diseases.	Total.	Arms of service.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other.
Diseases of the genito-urinary system—Con.									
Deaths:									
Officers	1.26	.78	3.14	1.18	5.78	.....	.....	.....	.....
Enlisted men	.26	.31	.16	.....	.78	.....	.44	.18	1.07
Total	.34	.34	.35	.10	1.37	.....	.36	.18	.88
Discharges:									
Enlisted men	.92	.80	1.28	1.19	.78	.....	.....	1.11	.....
Diseases of the locomotor system, excluding muscular rheumatism.									
Admissions:									
Officers	3.68	4.01	3.44	3.44	.....	4.22	7.94	.....	.....
Enlisted men	4.83	4.79	6.43	4.97	4.27	1.66	2.92	2.62	1.56
Total	4.76	4.75	6.28	4.87	3.88	2.08	3.69	2.62	1.34
Noneffectiveness:									
Officers	.50	.50	.32	.38	.....	3.03	.30	.....	.....
Enlisted men	.45	.42	.69	.33	1.42	.02	.17	.13	.05
Total	.45	.43	.68	.33	1.29	.52	.19	.13	.04
Deaths:									
Enlisted men	.01	.03	.....	.....	.....	.....	.....	.....	.....
Total	.01	.03	.....	.....	.....	.....	.....	.....	.....
Discharges:									
Enlisted men	.98	.86	1.76	.97	.....	.....	.....	.37	.....
Diseases of the integumentary system.									
Admissions:									
Officers	29.18	36.08	36.70	36.08	.....	12.66	15.87	.....	4.77
Enlisted men	82.19	73.53	105.35	103.67	53.80	88.04	17.98	81.10	21.48
Total	78.97	71.46	102.02	99.31	48.84	75.65	17.65	81.10	19.13
Noneffectiveness:									
Officers	1.33	1.49	2.29	.83	.....	.91	1.14	.....	.11
Enlisted men	2.17	2.16	2.54	2.57	1.24	2.18	.59	2.06	.51
Total	2.12	2.12	2.53	2.45	1.13	1.98	.68	2.06	.45
Deaths:									
Officers	.16	.....	.79	.....	.....	.....	.....	.....	.....
Total	.01	.....	.05	.....	.....	.....	.....	.....	.....
Discharges:									
Enlisted men	.23	.25	.27	.22	.....	.76	.....	.18	.....
Unclassified.									
Admissions:									
Officers	12.40	23.48	5.73	10.31	.....	.....	5.29	.....	.....
Enlisted men	18.80	20.27	19.17	15.74	7.69	12.46	13.60	27.03	5.47
Total	18.41	20.45	18.51	15.39	6.98	10.41	12.31	27.03	4.70
Noneffectiveness:									
Officers	.50	1.05	.24	.18	.....	.....	.05	.....	.....
Enlisted men	.41	.45	.34	.38	.13	.31	.48	.72	.08
Total	.42	.48	.34	.36	.12	.26	.41	.72	.07
Deaths:									
Enlisted men	.03	.03	.05	.....	.....	.....	.....	.....	.....
Total	.02	.03	.05	.....	.....	.....	.....	.....	.....
Discharges:									
Enlisted men	.07	.06	.....	.32	.....	.....	.....	.....	.....
Total for diseases.									
Admissions:									
Officers	786.82	953.03	909.40	1,068.73	344.52	130.81	510.60	.....	193.33
Enlisted men	1,110.73	1,046.56	1,219.59	1,334.67	1,152.00	1,567.28	489.79	1,236.02	391.41
Total	1,091.07	1,043.28	1,204.54	1,317.54	1,077.52	1,331.02	493.02	1,236.02	363.53
Noneffectiveness:									
Officers	46.04	49.91	59.62	50.32	22.84	7.21	49.61	.....	21.08
Enlisted men	32.42	31.32	33.94	38.22	31.10	35.60	14.80	41.25	12.03
Total	33.25	32.35	35.19	39.00	30.33	30.93	20.20	41.25	13.30
Deaths:									
Officers	10.08	10.99	10.22	7.06	23.12	5.78	7.26	.....	11.44
Enlisted men	4.43	4.87	3.95	3.03	9.36	2.28	4.44	2.77	8.93
Total	4.87	5.32	4.35	3.37	11.00	3.00	4.99	2.77	9.38
Discharges:									
Enlisted men	18.60	19.12	18.44	24.13	14.82	12.90	14.66	15.31	9.29

several arms of the service and ages of individuals, etc.—Continued.

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	.....	.....	1.06	1.04	.....	1.24	3.37	3.99	.....
.....	.14	.23	.15	.45	.39	.63	.....	10.26	.....
.....	.14	.22	.22	.52	.34	.75	1.63	5.75	.....
3.38	1.53	.92	.39	.30	.39	.31	.....	.....	18.52
.....	4.55	8.53	3.09	4.57	.....	3.62	1.64	2.92	.....
1.84	5.64	4.72	5.16	2.95	4.42	3.78	8.05	.....	.....
1.84	5.63	4.85	5.05	3.10	4.00	3.76	5.40	1.92	.....
.....	3.26	1.34	.15	.22	.....	.40	.03	.09	.....
.03	.49	.54	.50	.23	.23	.25	.54	.....	.....
.03	.52	.57	.48	.23	.21	.27	.33	.06	.....
.....	.....	.05	.....	.....	.....	.....	.....	.....	.....
.....	.....	.04	.....	.....	.....	.....	.....	.....	.....
.....	1.12	1.19	.93	.45	.58	.63	2.10	.....	.....
.....	54.55	32.72	35.49	19.82	33.73	37.97	14.73	23.32	8.70
127.30	115.34	82.36	57.87	56.47	56.89	46.42	48.28	50.56	81.63
127.30	114.65	80.67	56.70	52.91	54.67	45.07	34.44	32.63	30.49
.....	.61	1.24	2.27	.33	2.22	2.52	.34	.99	.19
2.66	2.80	1.94	1.72	2.18	1.78	1.56	3.03	1.09	1.40
2.66	2.78	1.91	1.74	2.04	1.83	1.72	1.92	1.02	.55
.....	.....	.....	1.06	.....	.....	.....	.....	.....	.....
.....	.....	.....	.07	.....	.....	.....	.....	.....	.....
.....	.28	.18	.23	.45	.....	.31	.....	.....	.....
.....	27.27	17.07	9.26	9.15	21.82	10.85	6.55	8.75	.....
24.91	28.02	17.11	14.64	13.09	10.96	11.03	6.90	16.85	20.41
24.91	28.01	17.11	14.36	12.71	12.00	10.98	6.75	11.52	6.10
.....	1.41	.82	.11	.60	1.12	.28	.10	.10	.....
.45	.64	.35	.31	.25	.29	.24	.21	.20	2.63
.45	.65	.37	.30	.29	.37	.24	.17	.14	.78
.....	.....	.09	.....	.....	.....	.....	.....	.....	.....
.....	.....	.09	.....	.....	.....	.....	.....	.....	.....
.....	.05	.09	.....	.....	.....	.31	.....	.....	18.52
.....	745.45	806.54	805.56	699.69	819.44	873.42	842.88	670.55	626.09
1,382.84	1,397.68	1,075.44	891.71	903.27	951.75	886.86	1,089.66	1,331.46	1,244.90
1,382.84	1,390.49	1,066.27	889.23	883.53	939.05	884.71	987.85	896.35	810.97
.....	31.40	36.92	42.77	33.54	52.79	49.51	63.05	50.47	69.74
35.93	40.03	30.72	26.36	27.19	28.61	29.61	37.58	55.21	65.97
35.93	39.94	30.93	27.21	27.80	30.93	32.79	48.09	52.09	68.61
.....	.....	2.92	4.23	5.22	8.16	11.15	19.08	25.95	41.67
4.22	2.79	3.67	3.71	4.04	9.06	11.32	14.72	30.77	55.56
4.22	2.75	3.64	3.75	4.19	8.95	11.29	16.83	27.30	45.05
34.60	19.44	16.94	15.93	15.57	20.23	19.81	46.27	82.05	74.07

TABLE XVIII.—*The relation of certain classes of disease to the*

Orders of diseases.	Total.	Arms of service.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other.
Total for injuries.									
Admissions:									
Officers	68.47	80.76	104.36	56.70	25.21	33.76	37.04	.....	19.09
Enlisted men	260.08	234.34	369.34	290.77	193.00	351.31	43.25	174.29	56.64
Total	248.43	225.83	356.49	275.68	177.52	299.09	42.28	174.29	51.36
Noneffectiveness:									
Officers	5.56	7.16	7.61	5.18	.71	1.44	3.76	.....	.50
Enlisted men	8.36	7.40	12.77	8.78	5.51	8.71	1.27	4.78	2.41
Total	8.19	7.38	12.52	8.55	5.07	7.51	1.66	4.78	2.14
Deaths:									
Officers	1.42	1.96	1.57	1.18	.....	.....	1.81	.....	.....
Enlisted men	2.97	2.42	4.97	2.71	4.68	1.52	1.78	.92	1.79
Total	2.85	2.39	4.75	2.58	4.12	1.20	1.78	.92	1.47
Discharges:									
Enlisted men	2.62	2.39	3.79	2.81	.78	.76	.44	2.21	1.07
Total diseases and injuries.									
Admissions:									
Officers	855.29	1,033.79	1,013.76	1,125.43	369.73	164.55	547.62	.....	212.42
Enlisted men	1,370.81	1,282.90	1,588.93	1,625.44	1,345.00	1,918.60	533.04	1,410.33	448.06
Total	1,339.51	1,269.10	1,561.05	1,593.22	1,255.04	1,630.12	535.30	1,410.33	414.90
Noneffectiveness:									
Officers	51.60	57.07	67.23	55.50	23.55	8.65	53.37	.....	21.58
Enlisted men	40.77	38.72	46.71	47.00	36.61	44.30	16.07	46.04	14.43
Total	41.43	39.74	47.70	47.55	35.40	38.44	21.86	46.04	15.44
Deaths:									
Officers	11.49	12.35	11.79	8.24	23.12	5.78	9.07	.....	11.44
Enlisted men	7.40	7.29	8.92	5.74	14.04	3.79	6.22	3.69	10.72
Total	7.72	7.70	9.11	5.94	15.12	4.21	6.78	3.69	10.85
Discharges:									
Enlisted men	21.22	21.51	22.23	26.95	15.60	13.66	15.10	17.52	10.36

several arms of the service and ages of individuals, etc.—Continued.

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	72.73	83.92	72.54	57.92	73.41	65.10	65.47	61.22	34.78
280.43	306.92	288.29	220.89	206.56	187.10	160.25	190.80	179.77	183.68
280.43	304.31	281.33	213.19	192.13	176.18	145.04	139.08	101.73	79.27
.....	5.19	5.66	6.02	5.06	7.05	6.61	4.39	5.48	.76
7.22	8.98	9.23	7.12	7.26	7.33	7.73	8.11	6.84	10.95
7.22	8.94	9.10	7.06	7.05	7.30	7.55	6.58	5.95	3.81
.....	.....	4.87	1.06	1.04	2.72	.....	.....	.....	.....
2.53	2.42	3.12	3.87	3.14	2.50	2.83	2.10	5.13	.....
2.53	2.38	3.20	3.68	2.88	2.53	2.26	1.09	1.44	.....
2.53	3.58	2.71	1.93	1.80	1.73	2.20	1.05	.....	.....
.....	818.18	890.47	878.09	757.62	892.85	938.52	908.35	731.78	660.87
1,663.28	1,704.59	1,363.73	1,112.60	1,109.82	1,138.85	1,047.11	1,280.46	1,511.24	1,428.57
1,663.28	1,694.78	1,347.60	1,100.42	1,075.67	1,115.24	1,029.76	1,126.94	998.08	890.24
.....	36.59	42.58	48.79	38.60	59.85	56.13	67.44	55.96	70.50
43.16	49.01	39.95	33.48	34.45	35.94	37.34	45.70	62.05	76.92
43.16	48.87	40.03	34.27	34.85	38.23	40.34	54.67	58.04	72.42
.....	.....	7.80	5.29	6.26	10.88	11.15	19.08	23.95	41.67
6.75	5.21	6.79	7.58	7.18	11.56	14.15	16.82	35.90	55.56
6.75	5.13	6.84	7.43	7.07	11.48	13.54	17.92	28.74	45.05
37.13	23.02	19.64	17.87	17.36	21.97	22.01	47.32	82.05	74.07

TABLE XIX.—*The relation of certain classes of disease to nativities and*

[Annual rates for the period of three

Orders of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
Total specific febrile and acute infectious diseases, including erysipelas.						
Admissions:						
Officers	162.19	161.25	88.89	282.07	193.54	157.88
Enlisted men	142.42	152.20	136.40	120.63	135.41	116.77
Total	143.59	153.03	135.91	121.42	136.10	117.37
Noneffectiveness:						
Officers	6.49	6.56	4.26	5.47	5.66	3.46
Enlisted men	3.47	3.61	3.50	3.01	3.49	3.49
Total	3.65	3.88	3.51	3.02	3.51	3.49
Deaths:						
Officers	.94	1.00				
Enlisted men	1.05	1.02	2.01	.79	.71	
Total	1.04	1.02	1.98	.78	.70	
Discharges:						
Enlisted men	.03	.04				
Malarial diseases.						
Admissions:						
Officers	45.26	43.10	66.67	76.93		
Enlisted men	74.91	77.27	74.16	72.29	73.15	82.29
Total	73.11	74.17	74.08	72.31	72.28	81.08
Noneffectiveness:						
Officers	2.09	2.14	.82	1.40		
Enlisted men	2.05	2.09	1.83	2.04	2.03	2.72
Total	2.05	2.11	1.82	2.04	2.01	2.68
Deaths:						
Officers	.16	.17				
Enlisted men	.08	.09	.11			
Total	.09	.10	.10			
Discharges:						
Enlisted men	.12	.09	.11	.34		
Typho-malarial fever.						
Admissions:						
Enlisted men	.31	.29	.35	.12		.78
Total	.29	.26	.34	.12		.77
Noneffectiveness:						
Enlisted men	.05	.05	.05	.01		.21
Total	.05	.05	.05	.01		.20
Deaths:						
Enlisted men	.04	.02	.11	.11		
Total	.04	.02	.10	.11		
Diarrheal diseases.						
Admissions:						
Officers	55.82	53.03	77.78	102.56	193.55	52.63
Enlisted men	118.33	121.57	130.50	96.59	133.07	129.31
Total	114.54	115.35	129.95	96.62	133.80	128.18
Noneffectiveness:						
Officers	1.17	1.12	1.13	3.65	1.85	.72
Enlisted men	1.33	1.27	1.51	1.46	1.58	1.65
Total	1.32	1.26	1.51	1.47	1.59	1.64
Deaths:						
Officers	.16	.17				
Enlisted men	.01	.02				
Total	.02	.04				
Discharges:						
Enlisted men	.12	.15	.11			
Septic diseases (excluding erysipelas).						
Admissions:						
Officers	.23	.24				
Enlisted men	.09	.12	.12			
Total	.10	.13	.12			
Noneffectiveness:						
Officers	.03	.03				
Enlisted men	.001	.002	.001			
Total	.003	.01	.001			
Deaths:						
Enlisted men	.01	.02				
Total	.01	.02				

lengths of service, expressed in ratios per 1,000 of their mean strengths.

years ending December 31, 1892.]

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All other.	Under 1.	1 and over.
750.00	214.28	250.00	500.00	333.33	125.00	222.22	60.98	164.13
131.93	102.00	113.60	109.86	142.18	139.71	105.23	194.08	129.46
133.73	104.58	114.53	110.96	143.07	139.27	106.06	193.28	132.01
36.95	8.80	9.58	9.58	1.82	.68	2.13	3.44	6.55
3.24	2.54	3.51	2.15	4.23	2.72	2.59	5.29	3.01
3.34	2.68	3.55	2.17	4.22	2.66	2.59	5.28	3.27
.....	.....	.....	.....	.....	.....	.....	.....	.96
.67	.....	.....	.....	1.41	.....	.75	1.90	.83
.66	.....	.....	.....	1.41	.....	.74	1.88	.84
.....	.....	.....	.....	.....	.....	.....	.07	.02
.....	142.85	.....	.....	.....	125.00	777.78	12.20	45.89
64.87	65.22	77.46	42.25	69.55	51.47	56.28	102.44	68.05
64.68	66.99	76.93	42.13	69.23	53.57	61.54	101.80	66.43
.....	4.10	.....	.....	.....	2.40	7.60	5.17	2.03
2.03	1.18	2.69	1.25	2.59	1.54	1.89	3.13	1.77
2.02	1.24	2.68	1.25	2.58	1.56	1.93	3.15	1.80
.....	.....	.....	.....	.....	.....	.....	.....	.16
.....	.....	.....	.....	.....	3.37	.....	.....	.10
.....	.....	.....	.....	.....	3.24	.....	.....	.11
.....	.....	.....	1.29	.....	.....	.....	.27	.08
.73	1.67	.....	1.41	1.55	.....	.....	.37	.30
.73	1.63	.....	1.40	1.54	.....	.....	.37	.....
.11	.37	.....	.04	.12	.....	.....	.05	.05
.11	.36	.....	.04	.12	.....	.....	.05	.05
.....	.....	.....	.....	.....	.....	.....	.....	.05
.....	.....	.....	.....	.....	.....	.....	.....	.05
.....	214.29	250.00	.....	.....	125.00	111.11	.....	56.90
116.62	115.38	89.50	88.73	89.64	128.68	72.59	153.07	109.63
116.28	117.65	90.60	88.48	89.23	128.57	72.87	152.14	105.76
.....	8.21	2.74	.....	.....	2.05	.30	.....	1.19
1.17	1.18	.80	1.03	2.16	1.58	.55	1.60	1.26
1.17	1.34	.81	1.03	2.15	1.59	.55	1.59	1.26
.....	.....	.....	.....	.....	.....	.....	.....	.16
.....	.....	.....	.....	.....	.....	.....	.....	.02
.....	.....	.....	.....	.....	.....	.....	.....	.03
.67	.....	.....	.....	.....	.....	.....	.14	.12
.....	.....	.....	.....	.....	.....	.....	.....	.23
.....	.....	.....	.....	.....	.....	.....	.....	.11
.....	.....	.....	.....	.....	.....	.....	.....	.12
.....	.....	.....	.....	.....	.....	.....	.....	.03
.....	.....	.....	.....	.....	.....	.....	.....	.002
.....	.....	.....	.....	.....	.....	.....	.....	.004
.....	.....	.....	.....	.....	.....	.....	.....	.02
.....	.....	.....	.....	.....	.....	.....	.....	.02

TABLE XIX.—*The relation of certain classes of disease*

Orders of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
Venereal diseases.						
Admissions:						
Officers	5.05	5.08	.....	25.64	.....	.....
Enlisted men	79.34	93.32	54.49	53.88	61.09	96.39
Total	74.83	85.30	53.93	53.74	60.36	94.98
Noneffectiveness:						
Officers	.50	.52	.....	.28	.....	.....
Enlisted men	5.36	6.33	3.71	3.84	3.76	6.18
Total	5.07	5.80	3.67	3.82	3.71	6.09
Deaths:						
Officers	.16	.17	.....	.....	.....	.....
Total	.01	.02	.....	.....	.....	.....
Discharges:						
Enlisted men	2.31	2.92	1.38	.90	1.07	5.02
Zoögenous diseases.						
Admissions:						
Officers	1.61	1.69	.....	.....	.....	.....
Enlisted men	51.27	65.51	33.90	14.60	28.02	50.16
Total	48.25	59.71	33.55	14.53	27.68	49.42
Noneffectiveness:						
Officers	.02	.02	.....	.....	.....	.....
Enlisted men	1.59	2.16	.81	.31	.60	1.57
Total	1.51	1.98	.80	.31	.59	1.55
Deaths:						
Enlisted men	.01	.....	.11	.....	.....	.....
Total	.01	.....	.10	.....	.....	.....
Discharges:						
Enlisted men	.03	.02	.....	.11	.....	.....
Dietic diseases.						
Admissions:						
Officers	7.12	6.78	22.22	25.64	.....	.....
Enlisted men	42.13	34.23	67.41	30.68	54.47	35.27
Total	40.01	31.74	96.64	30.66	53.83	34.75
Noneffectiveness:						
Officers	.12	.09	1.28	.35	.....	.....
Enlisted men	.51	.43	1.12	.38	.64	.32
Total	.48	.40	1.12	.38	.63	.32
Deaths:						
Officers	.16	.17	.....	.....	.....	.....
Enlisted men	.18	.11	.42	.22	.....	.....
Total	.17	.12	.42	.22	.....	.....
Discharges:						
Enlisted men	.19	.27	.11	.....	.36	.....
Constitutional diseases (including muscular rheumatism).						
Admissions:						
Officers	78.79	75.79	188.89	51.28	96.78	157.89
Enlisted men	81.20	83.06	84.11	80.51	66.15	74.45
Total	81.05	82.42	85.19	80.37	66.51	75.67
Noneffectiveness:						
Officers	7.31	6.65	18.04	1.33	26.75	6.48
Enlisted men	3.95	4.06	4.27	3.92	2.58	3.39
Total	4.15	4.29	4.41	3.91	2.86	3.43
Deaths:						
Officers	.31	.17	7.58	.....	.....	.....
Enlisted men	.18	.11	.11	.34	.36	.....
Total	.19	.12	.21	.33	.35	.....
Discharges:						
Enlisted men	2.08	1.93	2.33	2.81	1.07	2.87
Developmental diseases.						
Admissions:						
Officers	.46	.48	.....	.....	.....	.....
Enlisted men	.52	.56	.46	.49	1.17	.....
Total	.52	.55	.46	.49	1.15	.....
Noneffectiveness:						
Officers	.44	.46	.....	.....	.....	.....
Enlisted men	.05	.04	.03	.12	.10	.....
Total	.07	.08	.03	.11	.10	.....
Discharges:						
Enlisted men	.80	.62	1.06	1.01	1.42	.72

to nativities and lengths of service, etc.—Continued.

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All other.	Under 1.	1 and over.
							24.39	4.68
63.41	58.53	34.42	57.75	69.55	73.53	41.60	143.79	63.20
63.23	57.19	34.19	57.59	69.23	71.43	41.29	143.08	58.91
							1.64	.48
4.12	4.17	2.15	3.55	4.41	3.59	2.61	9.01	4.45
4.11	4.07	2.13	3.54	4.39	3.49	2.59	8.97	4.16
								.16
								.02
2.67			1.29			1.49	5.15	1.60
							24.39	1.17
54.67	26.76	25.82	45.07	41.73	18.38	23.65	213.88	10.56
54.50	26.15	25.64	44.94	41.54	17.86	23.48	212.76	9.87
							.63	.01
1.29	.73	.68	.79	.96	.46	.52	6.81	.28
1.29	.72	.68	.78	.95	.45	.52	6.78	.26
								.02
								.02
							.07	.02
								7.26
20.41	53.51	13.77	28.17	15.45	58.82	26.92	17.87	48.20
20.35	52.29	13.68	28.09	15.38	57.15	26.72	17.77	45.20
								.12
.24	.79	.20	.27	.16	.59	.27	.24	.57
.24	.77	.20	.27	.16	.58	.27	.24	.54
								.16
	1.53	1.57						.22
	1.48	1.56						.21
							.41	.14
	142.85	250.00			250.00		24.39	79.84
74.35	51.84	92.94	80.28	72.64	51.47	68.52	72.31	83.41
74.13	53.92	94.01	80.06	72.31	57.15	68.01	72.03	83.16
	3.71	2.74			206.66		.63	7.44
4.30	1.39	6.85	5.05	2.47	.68	1.97	3.65	4.02
4.29	1.44	6.83	5.03	2.45	6.57	1.95	3.63	4.27
								.32
.67		1.57		1.41				.22
.66		1.56		1.41				.23
2.00		1.57	5.15	2.82		1.49	1.97	2.10
								.47
.75							1.19	.35
.73							1.18	.36
								.45
.13							.09	.04
.13							.09	.07
1.33	1.53	1.57		4.24			1.36	.66

TABLE XIX.—*The relation of certain classes of disease*

Orders of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
Parasitic diseases.						
Admissions:						
Officers	1.15	1.21				
Enlisted men	3.06	3.34	1.62	4.05	1.95	.78
Total	2.94	3.15	1.60	4.03	1.92	.77
Noneffectiveness:						
Officers	.05	.05				
Enlisted men	.08	.09	.06	.09	.05	.01
Total	.08	.09	.06	.09	.05	.01
Diseases of the nervous system.						
Admissions:						
Officers	64.56	62.23	77.78	230.76	32.26	
Enlisted men	54.22	56.96	52.41	47.74	50.97	44.67
Total	54.83	57.44	52.67	48.61	50.75	44.01
Noneffectiveness:						
Officers	6.00	5.64	10.16	32.29	1.06	1.87
Enlisted men	1.52	1.43	1.68	1.57	1.28	1.21
Total	1.79	1.81	1.77	1.72	1.28	1.22
Deaths:						
Officers	2.52	2.66				
Enlisted men	.41	.31	.85	.11	1.07	1.43
Total	.57	.59	.83	.11	1.05	1.41
Discharges:						
Enlisted men	2.86	2.35	3.91	3.14	3.91	6.45
Diseases of the eye.						
Admissions:						
Officers	15.85	15.74	11.11	51.28		
Enlisted men	20.16	21.84	17.12	15.83	16.34	16.46
Total	19.90	21.28	17.06	16.00	16.15	16.22
Noneffectiveness:						
Officers	1.89	1.88	.67	9.97		
Enlisted men	.67	.67	.69	.61	.45	.56
Total	.75	.78	.69	.65	.44	.55
Discharges:						
Enlisted men	1.21	1.02	1.38	1.57	2.13	2.87
Diseases of the ear.						
Admissions:						
Officers	3.68	3.15	11.11			
Enlisted men	8.42	7.70	7.52	8.84	10.51	11.75
Total	8.13	7.28	7.56	8.79	10.38	11.58
Noneffectiveness:						
Officers	.17	.17	.18			
Enlisted men	.37	.36	.25	.28	.74	.26
Total	.35	.34	.25	.28	.73	.25
Discharges:						
Enlisted men	.60	.69	.21	.22	1.07	
Diseases of the nose.						
Admissions:						
Officers	3.45	3.15	11.11	25.64		
Enlisted men	1.94	1.99	1.39	2.09	1.56	3.13
Total	2.04	2.09	1.49	2.20	1.54	3.09
Noneffectiveness:						
Officers	.74	.74	1.79	.42		
Enlisted men	.10	.09	.13	.07	.15	.08
Total	.14	.15	.15	.07	.15	.08
Discharges:						
Enlisted men	.18	.20	.21	.22		
Diseases of the respiratory system.						
Admissions:						
Officers	130.03	126.63	211.11	282.05	129.03	105.26
Enlisted men	124.17	132.63	120.32	95.61	135.02	126.96
Total	124.53	132.09	121.37	96.50	134.95	126.63
Noneffectiveness:						
Officers	5.47	4.93	21.32	34.32	.97	1.44
Enlisted men	3.31	3.54	3.44	2.53	2.60	3.07
Total	3.44	3.65	3.62	2.68	2.58	3.05

to nativities and lengths of service, etc.—Continued.

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All other.	Under 1.	1 and over.
								1.17
1.46	8.36	1.72	2.82	4.64	3.68	.82	7.19	2.02
1.45	8.17	1.71	2.81	4.62	3.57	.81	7.15	1.96
								.05
.01	.12	.01	.04	.05	.03	.01	.19	.05
.01	.12	.01	.04	.05	.03	.01	.19	.05
	71.43	250.00			250.00	333.33		65.79
51.03	30.10	43.03	46.48	52.55	80.88	54.65	64.89	51.55
50.87	31.05	44.44	46.35	52.31	85.71	56.68	64.51	52.60
	.39	4.11			50.98	18.25		6.11
1.89	3.18	1.24	.87	2.01	3.20	2.60	1.60	1.50
1.88	3.12	1.26	.87	2.00	4.57	2.72	1.59	1.84
								2.57
		1.57	1.29				.34	.42
		1.56	1.28				.34	.63
3.33	1.53	1.57	3.86	4.24	3.37	4.47	3.53	2.70
						111.11		16.15
24.78	25.08	15.49	9.86	23.18	33.09	22.02	21.73	19.77
24.71	24.51	15.38	9.83	23.08	32.14	22.67	21.60	19.51
						2.13		1.93
.68	1.04	.49	.24	.81	1.52	1.38	.61	.69
.68	1.02	.48	.23	.81	1.48	1.39	.61	.78
1.33		1.57				2.24	1.09	1.24
250.00					125.00			3.75
13.85	8.36	15.49	7.04	17.00	18.38	13.05	13.35	7.18
14.53	8.17	15.38	7.02	16.92	21.43	12.95	13.27	6.93
4.11					1.37			.17
.42	.27	.34	.28	.26	2.56	1.00	.64	.30
.43	.26	.34	.28	.26	2.52	.99	.64	.29
					3.37	3.73	.95	.51
								3.51
4.37	6.69			1.55	3.68		2.15	1.89
4.36	6.54			1.54	3.57		2.14	2.01
								.76
.23	.27			.11	.02		.09	.10
.22	.26			.11	.02		.09	.15
							.14	.19
	142.85				250.00	333.33	85.36	130.88
113.72	128.76	91.23	83.10	94.28	128.68	93.80	153.88	116.74
113.37	129.09	90.60	82.86	93.84	132.14	95.55	153.47	117.77
	3.52				5.82	5.17	.90	5.56
4.19	5.12	3.12	1.75	1.53	4.49	1.77	3.92	3.15
4.17	5.08	3.10	1.74	1.52	4.53	1.76	3.90	3.33

TABLE XIX.—*The relation of certain classes of disease*

Orders of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
***Diseases of the respiratory system*—Continued.**						
Deaths:						
Officers	1.42	1.49	.....	.....	.....	.....
Enlisted men	1.41	1.44	1.48	1.01	2.13	2.15
Total	1.41	1.45	1.46	1.00	2.10	2.11
Discharges:						
Enlisted men	2.36	2.57	1.90	2.02	1.07	4.30
Diseases of the circulatory system.						
Admissions:						
Officers	5.97	5.57	.....	.....	32.26	.....
Enlisted men	6.81	6.08	8.33	9.08	7.39	7.84
Total	6.76	6.03	8.24	9.04	7.69	7.72
Noneffectiveness:						
Officers	1.91	1.74	.....	.....	9.01	.....
Enlisted men	.57	.47	.72	.89	.63	.31
Total	.65	.58	.71	.89	.73	.31
Deaths:						
Officers	.94	1.00	.....	.....	.....	.....
Enlisted men	.41	.38	.74	.34	.36	.72
Total	.45	.45	.73	.33	.35	.70
Discharges:						
Enlisted men	1.78	1.57	2.33	2.13	2.13	.72
Diseases of the digestive system.						
Admissions:						
Officers	142.89	144.79	111.11	128.22	96.78	52.63
Enlisted men	173.94	186.04	152.13	149.23	166.14	159.87
Total	172.06	182.30	151.71	149.13	165.31	158.29
Noneffectiveness:						
Officers	7.20	7.42	4.08	3.37	.97	7.78
Enlisted men	2.98	3.08	2.70	3.13	2.77	2.46
Total	3.24	3.48	2.71	3.13	2.75	2.54
Deaths:						
Officers	1.89	1.83	7.58	.....	.....	.....
Enlisted men	.33	.22	.42	.67	.36	.....
Total	.45	.41	.52	.67	.35	.....
Discharges:						
Enlisted men	1.64	1.55	1.59	1.80	1.42	1.43
Diseases of the lymphatic system.						
Admissions:						
Officers	.92	.97	.....	.....	.....	.....
Enlisted men	5.79	6.22	5.32	5.65	4.28	5.49
Total	5.49	5.74	5.27	5.62	4.23	5.41
Noneffectiveness:						
Officers	.03	.03	.....	.....	.....	.....
Enlisted men	.50	.52	.63	.35	.37	.48
Total	.47	.47	.62	.35	.37	.47
Deaths:						
Enlisted men	.01	.02	.....	.....	.....	.....
Total	.01	.02	.....	.....	.....	.....
Discharges:						
Enlisted men	.10	.07	.21	.....	.36	.....
Diseases of the genito-urinary system.						
Admissions:						
Officers	16.54	15.98	22.22	51.28	32.26	52.63
Enlisted men	15.85	17.77	10.87	14.97	10.12	17.24
Total	15.90	17.61	10.99	15.15	10.38	17.76
Noneffectiveness:						
Officers	2.09	2.07	3.07	5.41	.53	2.02
Enlisted men	.94	1.00	.68	.84	.85	2.00
Total	1.01	1.10	.70	.86	.85	2.00
Deaths:						
Officers	1.26	1.16	.....	.....	.....	37.04
Enlisted men	.26	.27	.32	.22	.....	.72
Total	.34	.37	.31	.22	.....	1.41
Discharges:						
Enlisted men	.92	.95	.53	.79	1.07	.72

to nativities and lengths of service, etc.—Continued.

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All other.	Under 1.	1 and over.
								1.44
4.00				1.41			1.76	1.32
3.98				1.41			1.75	1.34
4.67	7.65	1.57					3.05	2.19
	71.43					111.11		6.09
4.37	10.02	5.16	8.45	6.18	11.03	4.08	7.56	6.63
4.36	11.44	5.13	8.43	6.15	10.71	4.86	7.52	6.59
	.39					93.98		1.95
.65	1.15	.31	.88	.77	.63	.48	.50	.59
.65	1.13	.31	.88	.76	.62	1.16	.50	.69
								.96
				1.41			.14	.48
				1.41			.13	.52
1.34	3.06	1.57	3.86	1.41		2.24	1.70	1.80
		500.00			250.00	111.11	48.78	144.69
180.77	137.13	177.28	157.74	165.38	161.75	141.11	233.38	159.04
180.22	133.98	179.49	157.30	164.61	164.29	140.87	232.28	158.03
		4.11			1.37	.30	.87	7.33
3.05	1.90	3.15	1.94	1.90	2.16	3.22	3.71	2.80
3.04	1.85	3.16	1.94	1.89	2.14	3.20	3.70	3.13
								1.93
.67				1.41		.75	.20	.36
.66				1.41		.74	.20	.51
1.34	1.53	4.72		2.82	3.37	3.73	2.17	1.51
								.94
4.37	3.34	5.16	5.63	1.55	7.35	4.08	7.86	5.27
4.36	3.27	5.13	5.62	1.54	7.14	4.05	7.81	4.95
								.03
.51	.14	.34	.39	.33	.54	.53	.67	.45
.51	.13	.34	.39	.32	.53	.53	.67	.42
								.02
								.02
						.75	.20	.07
								16.86
16.77	15.05	12.05	9.86	15.45	11.03	8.97	23.66	13.90
16.72	14.71	11.96	9.83	15.38	10.71	8.91	23.51	14.12
								2.13
1.29	.65	1.36	.68	.91	.44	.60	1.38	.83
1.29	.63	1.35	.68	.90	.43	.60	1.34	.93
								1.28
				1.41			.14	.29
				1.41			.13	.36
1.34		1.57	1.29	2.82		2.24	2.17	.61

TABLE XIX.— *The relation of certain classes of disease*

Orders of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
Diseases of the locomotor system (excluding muscular rheumatism).						
Admissions:						
Officers	3.68	3.87				
Enlisted men	4.83	5.08	3.35	5.28	5.45	1.57
Total	4.76	4.97	3.32	5.25	5.38	1.54
Noneffectiveness:						
Officers	.50	.53				
Enlisted men	.45	.48	.33	.49	.29	.20
Total	.45	.49	.33	.49	.29	.19
Deaths:						
Enlisted men	.01	.02				
Total	.01	.02				
Discharges:						
Enlisted men	.98	.95	1.27	.79	1.42	.72
Diseases of the integumentary system.						
Admissions:						
Officers	29.18	29.54	33.33			
Enlisted men	82.19	88.60	68.14	76.58	73.93	76.80
Total	78.97	83.24	67.78	76.21	73.05	75.67
Noneffectiveness:						
Officers	1.33	1.29	2.43			
Enlisted men	2.17	2.28	2.20	2.01	1.62	1.74
Total	2.12	2.19	2.20	2.00	1.61	1.71
Deaths:						
Officers	.16	.17				
Total	.01	.02				
Discharges:						
Enlisted men	.23	.27	.11	.22	.36	
Unclassified.						
Admissions:						
Officers	12.40	12.83	11.11			
Enlisted men	18.80	21.25	14.69	14.24	13.23	17.24
Total	18.41	20.49	14.66	14.17	13.07	16.99
Noneffectiveness:						
Officers	.50	.52	.21			
Enlisted men	.41	.45	.34	.32	.16	.26
Total	.42	.46	.34	.32	.16	.25
Deaths:						
Enlisted men	.03	.04				
Total	.02	.04				
Discharges:						
Enlisted men	.07	.04	.11	.22		
Total for diseases.						
Admissions:						
Officers	786.82	773.12	944.44	1,333.33	806.45	578.95
Enlisted men	1,110.73	1,183.64	1,075.20	919.00	1,049.42	1,075.24
Total	1,091.07	1,146.33	1,073.85	920.97	1,046.52	1,067.95
Noneffectiveness:						
Officers	46.04	44.59	69.43	98.26	46.80	23.77
Enlisted men	32.42	34.49	30.68	28.27	26.73	32.16
Total	33.25	35.41	31.07	28.60	26.97	32.04
Deaths:						
Officers	10.08	10.12	15.15			37.04
Enlisted men	4.43	4.10	6.66	3.82	4.98	5.02
Total	4.87	4.81	6.78	3.79	4.90	5.63
Discharges:						
Enlisted men	18.60	18.26	18.83	18.29	18.85	25.81
Total for injuries.						
Admissions:						
Officers	68.47	67.07	88.89	51.28	193.53	
Enlisted men	260.08	269.16	275.80	223.37	243.98	264.11
Total	248.43	250.78	273.89	222.52	243.39	260.25
Noneffectiveness:						
Officers	5.56	5.49	6.05	7.86	9.45	
Enlisted men	8.36	8.33	9.74	7.81	7.85	7.23
Total	8.19	8.07	9.70	7.81	7.87	7.12

to nativities and lengths of service, etc.—Continued.

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All other.	Under 1.	1 and over.
								3.75
5.83	5.02	1.72	7.04	4.64	3.68	4.89	6.60	4.38
5.81	4.90	1.71	7.02	4.62	3.57	4.86	6.56	4.33
								.51
.94	.38	.05	.15	.21	.09	.35	.61	.41
.94	.37	.05	.15	.21	.09	.35	.60	.41
								.02
								.02
2.00			2.57				1.36	.88
		250.00			125.00		12.20	29.50
64.15	71.90	75.73	71.83	77.28	58.82	67.70	122.52	72.09
63.96	70.26	76.93	71.63	76.93	60.71	67.21	121.85	68.97
		13.00			24.29		.20	1.35
1.46	2.33	1.96	1.76	1.61	1.94	2.51	3.02	1.96
1.46	2.28	2.03	1.75	1.60	2.58	2.50	3.00	1.92
								.16
								.02
				1.41			.47	.17
							36.58	11.94
18.95	18.39	17.22	16.90	12.36	11.03	15.50	33.37	15.15
18.89	17.97	17.09	16.85	12.31	10.71	15.38	33.39	14.91
							1.07	.49
.53	.51	.30	.74	.29	1.25	.38	.76	.32
.53	.50	.30	.74	.28	1.21	.37	.76	.34
							.07	.02
							.07	.02
							.14	.05
1,000.00	1,000.00	1,750.00	500.00	333.33	1,625.00	2,111.11	329.28	795.60
1,032.07	943.15	908.78	880.28	978.36	1,055.15	825.45	1,597.09	988.99
1,031.97	944.44	914.53	879.21	975.38	1,071.43	834.81	1,589.41	974.78
41.06	29.13	36.27	9.58	1.82	295.62	129.87	14.55	46.65
32.47	29.38	29.57	23.83	27.87	30.05	25.22	47.59	28.62
32.50	29.38	29.61	23.79	27.74	37.64	25.98	47.39	29.95
								10.27
6.00	1.53	4.72	1.29	8.47	3.37	1.49	4.54	4.40
5.98	1.48	4.67	1.28	8.44	3.24	1.47	4.51	4.96
22.00	15.29	15.72	19.31	19.77	10.10	22.37	26.38	16.65
	214.28	250.00				111.11	12.20	69.54
258.77	264.21	203.10	236.61	194.74	261.03	191.69	326.91	243.35
257.99	263.06	203.42	235.95	193.84	253.58	191.10	325.01	230.58
	21.70	8.90				3.04	.40	5.66
9.30	12.01	6.04	6.90	6.57	5.63	6.20	9.62	8.04
9.27	12.23	6.06	6.88	6.54	5.46	6.17	9.56	7.87

TABLE XIX.—*The relation of certain classes of disease*

Orders of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
Total for injuries—Continued.						
Deaths:						
Officers	1.42	1.33				
Enlisted men	2.97	2.94	2.86	3.03	2.13	2.87
Total	2.85	2.75	2.82	3.01	2.10	2.81
Discharges:						
Enlisted men	2.62	2.55	3.39	2.47	2.13	2.87
Total diseases and injuries.						
Admissions:						
Officers	855.29	840.20	1,033.33	1,384.62	1,000.00	578.95
Enlisted men	1,370.81	1,452.79	1,350.99	1,142.36	1,293.39	1,339.33
Total	1,339.51	1,397.11	1,347.72	1,143.50	1,289.89	1,328.19
Noneffectiveness:						
Officers	51.60	50.08	75.49	106.12	56.25	23.77
Enlisted men	40.77	42.81	40.42	36.08	34.58	39.39
Total	41.43	43.48	40.78	36.41	34.84	39.16
Deaths:						
Officers	11.49	11.45	15.15			37.04
Enlisted men	7.40	7.04	9.52	6.85	7.11	7.89
Total	7.72	7.56	9.60	6.80	7.00	8.44
Discharges:						
Enlisted men	21.22	20.81	22.22	20.76	20.99	28.67

to nativities and lengths of service, etc.—Continued.

Nativities.							Length of service—years	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All other.	Under 1.	1 and over.
166.67	.....	.....	.....	.....	.....	.....	.....	1.44
4.00	6.12	1.57	6.44	1.41	3.37	2.98	2.58	3.07
4.65	5.93	1.56	6.41	1.41	3.23	2.95	2.56	2.92
3.33	3.06	1.57	1.29	2.82	.....	2.24	3.59	2.38
1,000.00	1,214.29	2,000.00	500.00	333.33	1,625.00	2,222.22	341.48	865.14
1,290.82	1,207.36	1,111.88	1,116.90	1,173.11	1,316.18	1,017.13	1,923.99	1,332.34
1,289.99	1,207.52	1,117.95	1,115.17	1,169.23	1,325.00	1,025.91	1,914.42	1,205.37
41.06	50.83	45.16	9.58	1.82	295.62	132.91	14.95	52.31
41.77	41.39	35.61	30.73	34.44	35.67	31.42	57.20	36.66
41.77	41.60	35.67	30.67	34.29	43.10	32.16	56.95	37.81
166.67	.....	.....	.....	.....	.....	.....	.....	11.71
10.00	7.65	6.29	7.72	9.89	6.73	4.47	7.12	7.47
10.62	7.41	6.23	7.69	9.85	6.47	4.42	7.06	7.88
25.33	18.35	17.30	20.59	22.60	10.10	24.61	29.98	19.03

TABLE XX.—*The relation of certain specified diseases to the several arms of the*

[Annual rates for the period of three

Names of diseases.	Total.	Arms of service.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other
Cerebro-spinal fever.									
Admissions:									
Officers	.23	.57							
Enlisted men	.06	.10							.39
Total	.07	.13							.34
Noneffectiveness:									
Officers	.001	.003							
Enlisted men	.004	.01							.01
Total	.004	.01							.01
Deaths:									
Officers	.16	.39							
Enlisted men	.03	.03							.36
Total	.04	.06							.29
Chicken pox.									
Admissions:									
Enlisted men	.43	.40	.29	.36				1.82	
Total	.40	.38	.28	.33				1.82	
Noneffectiveness:									
Enlisted men	.01	.01	.01	.01			.03	.05	
Total	.01	.01	.01	.01			.02	.05	
Dengue.									
Admissions:									
Officers	.46		1.15			4.22			
Enlisted men	1.04	.67	2.45	.12			2.92		.39
Total	1.00	.63	2.39	.11		.69	2.46		.34
Noneffectiveness:									
Officers	.01		.04			.07			
Enlisted men	.02	.01	.05	.001			.07		.002
Total	.02	.01	.05	.001		.01	.06		.002
Diphtheria.									
Admissions:									
Officers	.46		1.15				2.65		
Enlisted men	.28	.23	.47	.12	.85		.49	.20	
Total	.29	.22	.50	.11	.78		.82	.20	
Noneffectiveness:									
Officers	.01		.06				.02		
Enlisted men	.01	.01	.01	.01	.01		.01	.01	
Total	.01	.01	.02	.01	.01		.01	.01	
Deaths:									
Enlisted men	.01				.78				
Total	.01				.69				
Enteric fever.									
Admissions:									
Officers	3.91	4.01	6.88	5.15		4.22			
Enlisted men	5.14	5.66	7.42	3.08	4.27		2.43	1.82	1.95
Total	5.06	5.54	7.39	3.21	3.88	.69	2.05	1.82	1.68
Noneffectiveness:									
Officers	1.14	1.01	1.98	2.34		.46			
Enlisted men	.76	.79	1.12	.48	1.29		.40	.33	.16
Total	.78	.80	1.16	.60	1.17	.08	.34	.33	.14
Deaths:									
Officers	.31	.78							
Enlisted men	.49	.46	.80	.43					.71
Total	.47	.48	.75	.40					.59
Discharges:									
Enlisted men	.03	.03			.78				
Influenza.									
Admissions:									
Officers	152.32	168.38	167.43	245.70	67.23	16.88	132.27		42.96
Enlisted men	123.03	120.95	146.24	143.32	189.58	191.85	97.67	39.34	44.92
Total	124.81	123.57	147.27	149.90	178.28	163.08	103.03	39.34	44.64
Noneffectiveness:									
Officers	4.92	4.93	5.46	9.43	1.96	.47	4.25		1.44
Enlisted men	2.16	2.24	2.19	2.47	4.62	3.03	1.91	1.04	.92
Total	2.33	2.39	2.33	2.92	4.38	2.61	2.27	1.04	1.00

service and ages of individuals, expressed in ratios per 1,000 of their mean strengths.

years ending December 31, 1892,]

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	.....	.....	.....	1.52	.....	.....	.....	.....	.....
.....	.05	.05	.08	.....	.21	.....	.....	.....	.....
.....	.05	.05	.08	.15	.19	.....	.....	.....	.....
.....	.....	.....	.....	.01	.....	.....	.....	.....	.....
.....	.01	.001	.001	.....	.01	.....	.....	.....	.....
.....	.01	.001	.001	.001	.01	.....	.....	.....	.....
.....	.....	.....	.....	1.04	.....	.....	.....	.....	.....
.....	.....	.05	.....	.....	.19	.....	.....	.....	.....
.....	.....	.04	.....	.13	.17	.....	.....	.....	.....
.....	.86	.40	.25	.....	.....	.34	.....	.....	.....
.....	.85	.39	.24	.....	.....	.29	.....	.....	.....
.....	.03	.01	.01	.....	.....	.01	.....	.....	.....
.....	.03	.01	.01	.....	.....	.01	.....	.....	.....
.....	.....	.....	3.09	.....	.....	.....	.....	.....	.....
.92	1.47	1.00	.93	.82	.....	1.03	1.15	.....	.....
.92	1.46	.97	1.04	.74	.....	.87	.68	.....	.....
.....	.....	.....	.08	.....	.....	.....	.....	.....	.....
.02	.04	.02	.02	.02	.....	.02	.01	.....	.....
.02	.04	.02	.02	.01	.....	.01	.01	.....	.....
.....	.....	2.84	.....	.....	.....	.....	.....	.....	.....
.92	.46	.30	.17	.....	.21	.....	.....	.....	.....
.92	.45	.39	.16	.....	.19	.....	.....	.....	.....
.....	.....	.09	.....	.....	.....	.....	.....	.....	.....
.04	.02	.01	.01	.....	.004	.....	.....	.....	.....
.04	.02	.01	.004	.....	.003	.....	.....	.....	.....
.....	.....	.....	.....	.....	.19	.....	.....	.....	.....
.....	.....	.....	.....	.....	.17	.....	.....	.....	.....
.....	9.09	8.53	7.72	3.05	1.98	1.81	.....	.....	.....
11.07	8.64	5.27	2.96	2.29	1.69	.34	.....	5.62	.....
11.07	8.65	5.38	3.21	2.36	1.71	.58	.....	1.92	.....
.....	1.41	2.88	2.42	.70	.79	.35	.....	.....	.....
1.12	1.23	.79	.53	.44	.24	.03	.....	.15	.....
1.12	1.23	.86	.63	.46	.29	.08	.....	.05	.....
.....	.....	.97	1.06	.....	.....	.....	.....	.....	.....
1.69	.79	.55	.23	.....	.19	.....	.....	5.13	.....
1.69	.78	.57	.29	.....	.17	.....	.....	1.44	.....
.....	.....	.05	.08	.....	.....	.....	.....	.....	.....
.....	145.45	170.70	155.85	173.77	142.85	179.02	135.84	93.29	86.95
113.47	134.82	125.67	112.18	114.07	121.78	101.78	93.11	101.13	265.31
113.47	134.92	127.22	114.45	119.86	123.80	114.13	110.73	95.97	140.24
.....	4.86	4.93	3.19	5.62	4.15	5.09	6.22	4.77	6.66
2.10	2.22	2.11	1.90	1.93	2.59	2.69	2.46	3.64	11.84
2.10	2.25	2.20	1.97	2.28	2.74	3.07	4.01	4.39	8.21

TABLE XX.—*The relation of certain specified diseases to the several*

Names of diseases.	Total.	Arms of service.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other.
Influenza—Cont'd.									
Deaths:									
Officers	.31	.....	1.57	.....	.....	.....	.....	.....	.....
Enlisted men	.43	.74	.11	.54	.....	.....	.44	.....	.....
Total	.42	.68	.20	.50	.....	.....	.36	.....	.....
Measles.									
Admissions:									
Officers	1.15	1.15	2.29	1.72	.....	.....	.....	.....	.....
Enlisted men	6.27	4.16	2.05	6.39	.....	7.47	2.92	39.14	.....
Total	5.95	3.99	2.06	6.09	.....	6.25	2.46	39.14	.....
Noneffectiveness:									
Officers	.13	.03	.51	.11	.....	.....	.....	.....	.....
Enlisted men	.26	.17	.09	.31	.....	.29	.11	1.55	.....
Total	.25	.16	.11	.29	.....	.24	.09	1.55	.....
Mumps.									
Admissions:									
Officers	1.15	1.72	1.15	1.72	.....	.....	.....	.....	.....
Enlisted men	3.34	2.58	2.10	3.67	.85	4.98	.49	14.32	.78
Total	3.21	2.53	2.06	3.54	.78	4.16	.41	14.32	.67
Noneffectiveness:									
Officers	.04	.06	.04	.03	.....	.....	.....	.....	.....
Enlisted men	.11	.09	.07	.12	.03	.16	.01	.43	.04
Total	.11	.09	.07	.12	.03	.13	.01	.43	.04
Scarlet fever.									
Admissions:									
Officers	.46	.57	1.15	.....	.....	.....	.....	.....	.....
Enlisted men	.24	.23	.41	.12	.....	.....	.....	.....	.39
Total	.25	.25	.44	.11	.....	.....	.....	.....	.34
Noneffectiveness:									
Officers	.03	.01	.14	.....	.....	.....	.....	.....	.....
Enlisted men	.02	.02	.02	.01	.....	.....	.....	.....	.01
Total	.02	.02	.02	.01	.....	.....	.....	.....	.01
Smallpox.									
Admissions:									
Enlisted men	.10	.17	.06	.....	.....	.....	.....	.20	.....
Total	.10	.16	.06	.....	.....	.....	.....	20	.....
Noneffectiveness:									
Enlisted men	.01	.01	.001	.....	.....	.....	.....	.02	.03
Total	.01	.01	.001	.....	.....	.....	.....	.02	.02
Deaths:									
Enlisted men	.02	.03	.05	.....	.....	.....	.....	.....	.....
Total	.02	.03	.05	.....	.....	.....	.....	.....	.....
Varioloid.									
Admissions:									
Enlisted men	.03	.....	.06	.....	.....	.....	.49	.....	.....
Total	.03	.....	.06	.....	.....	.....	.41	.....	.....
Noneffectiveness:									
Enlisted men	.001	.....	.004	.....	.....	.....	.02	.....	.....
Total	.001	.....	.003	.....	.....	.....	.02	.....	.....
Whooping cough.									
Admissions:									
Enlisted men	.19	.23	.18	.24	.85	.....	.....	.....	.....
Total	.18	.22	.17	.22	.78	.....	.....	.....	.....
Noneffectiveness:									
Enlisted men	.01	.01	.01	.02	.05	.....	.....	.....	.....
Total	.01	.01	.01	.02	.05	.....	.....	.....	.....
Erysipelas.									
Admissions:									
Officers	1.61	3.44	.....	.....	.....	.....	.....	.....	2.39
Enlisted men	1.89	2.28	1.93	1.30	2.56	.....	1.46	1.41	.78
Total	1.87	2.34	1.83	1.22	2.33	.....	1.23	1.43	1.01

arms of the service and ages of individuals, etc.—Continued.

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	.....	.....	.....	.....	1.36	.....	.....	2.00	.....
.....	.19	.41	.85	.....	.58	1.26	1.05	.....	.....
.....	.18	.39	.79	.....	.67	1.00	.54	1.44	.....
.....	.....	2.84	3.09	1.52	.....	.....	.....	.....	.....
20.30	14.09	4.32	2.28	1.31	.21	.34	.....	.....	.....
20.30	13.93	4.27	2.33	1.33	.19	.29	.....	.....	.....
.....	.....	.64	.14	.04	.....	.....	.....	.....	.....
.86	.57	.18	.10	.07	.01	.02	.....	.....	.....
.86	.56	.20	.10	.07	.01	.02	.....	.....	.....
.....	4.55	2.84	.....	.....	3.97	.....	.....	.....	.....
10.15	7.07	2.51	1.10	1.15	.84	.34	.....	.....	.....
10.15	7.04	2.52	1.04	1.03	1.14	.29	.....	.....	.....
.....	.12	.07	.....	.....	.15	.....	.....	.....	.....
.35	.23	.08	.04	.03	.04	.01	.....	.....	.....
.35	.23	.08	.04	.03	.05	.01	.....	.....	.....
.....	.....	2.84	.....	.....	1.98	.....	.....	.....	.....
.....	.51	.25	.08	.....	.....	.....	.....	.....	.....
.....	.50	.29	.08	.....	.19	.....	.....	.....	.....
.....	.....	.04	.....	.....	.24	.....	.....	.....	.....
.....	.04	.02	.001	.....	.....	.....	.....	.....	.....
.....	.04	.02	.001	.....	.02	.....	.....	.....	.....
1.84	.15	.05	.....	.16	.....	.....	.....	.....	.....
1.84	.15	.05	.....	.15	.....	.....	.....	.....	.....
.26	.01	.002	.....	.02	.....	.....	.....	.....	.....
.26	.01	.001	.....	.02	.....	.....	.....	.....	.....
.....	.05	.05	.....	.....	.....	.....	.....	.....	.....
.....	.05	.04	.....	.....	.....	.....	.....	.....	.....
.....	.05	.....	.....	.16	.....	.....	.....	.....	.....
.....	.05	.....	.....	.15	.....	.....	.....	.....	.....
.....	.002	.....	.....	.01	.....	.....	.....	.....	.....
.....	.002	.....	.....	.01	.....	.....	.....	.....	.....
.....	.25	.15	.08	.16	.42	.....	1.15	.....	.....
.....	.25	.15	.08	.15	.38	.....	.68	.....	.....
.....	.01	.01	.01	.01	.02	.....	.03	.....	.....
.....	.01	.01	.01	.01	.02	.....	.01	.....	.....
.....	.....	.....	1.54	.....	.....	1.81	6.55	.....	8.70
.92	1.83	1.30	1.86	2.29	3.37	3.44	2.30	.....	.....
.92	1.81	1.26	1.84	2.07	3.05	3.18	4.05	.....	6.10

TABLE XX.—*The relation of certain specified diseases to the several*

Names of diseases.	Total.	Arms of service.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other.
Erysipelas—Cont'd.									
Noneffectiveness:									
Officers	.20	.46							.18
Enlisted men	.09	.10	.10	.07	.09		.04	.07	.01
Total	.09	.12	.10	.06	.08		.03	.07	.04
Deaths:									
Officers	.16								1.63
Enlisted men	.04	.06	.05						
Total	.05	.06	.05						.29
Quinsy.									
Admissions:									
Enlisted men	.10	.10	.18				.49		
Total	.10	.09	.17				.41		
Noneffectiveness:									
Enlisted men	.003	.003	.003				.01		
Total	.002	.003	.003				.01		
Deaths:									
Enlisted men	.01						.44		
Total	.01						.36		
Tonsillitis.									
Admissions:									
Officers	18.84	25.20	22.94	18.90			15.87		2.39
Enlisted men	40.34	40.49	45.40	42.49	30.74	50.66	15.06	43.98	10.55
Total	39.03	39.64	44.31	40.96	27.91	42.33	15.09	43.98	9.40
Noneffectiveness:									
Officers	.41	.51	.50	.44			.53		.06
Enlisted men	.59	.59	.64	.56	.38	.74	.21	.82	.18
Total	.58	.59	.63	.58	.35	.62	.26	.82	.16
Other specific febrile and acute infectious diseases.									
Admissions:									
Officers	.46		1.15	1.72					
Enlisted men	.25	.37	.06	.59					
Total	.26	.35	.11	.66					
Noneffectiveness:									
Officers	.01		.02	.05					
Enlisted men	.004	.01	.001	.01					
Total	.004	.01	.001	.02					
Bronchitis.									
Admissions:									
Officers	82.25	104.81	95.18	116.83	42.02	4.22	29.10		16.70
Enlisted men	83.47	79.06	93.06	104.03	130.65	137.88	24.78	67.78	29.69
Total	83.39	80.48	93.78	104.84	122.47	115.89	25.45	67.78	27.86
Noneffectiveness:									
Officers	3.07	2.79	5.00	2.67	6.42	.13	3.75		.92
Enlisted men	1.45	1.45	1.43	1.72	2.36	2.16	.66	1.56	.44
Total	1.55	1.53	1.60	1.78	2.74	1.82	1.14	1.56	.51
Deaths:									
Enlisted men	.03	.06							
Total	.02	.06							
Discharges:									
Enlisted men	.18	.28	.11	.11			.44		
Pulmonary phthisis.									
Admissions:									
Officers	2.07	1.72	3.44	3.44					2.39
Enlisted men	3.62	4.12	3.86	3.31	4.27	5.81	1.46	1.41	2.19
Total	3.53	3.99	3.84	3.32	3.88	4.86	1.23	1.41	2.01
Noneffectiveness:									
Officers	1.01	.73	2.70	.25			.74		2.14
Enlisted men	.86	.82	.92	1.27	.59	2.15	.11	.32	.62
Total	.87	.82	.98	1.21	.53	1.80	.20	.32	.83
Deaths:									
Officers	.63	.78	1.57						
Enlisted men	.62	.64	.53	.65	1.56		.44	.37	1.43
Total	.62	.65	.60	.59	1.37		.36	.37	1.17
Discharges:									
Enlisted men	1.86	1.90	1.92	2.49	2.34	2.28	.89	.92	1.07

arms of the service and ages of individuals, etc.—Continued.

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	.....	.....	.56	.13	.....	.13	.35	.....	1.31
.04	.08	.07	.09	.08	.13	.19	.05	.....	.....
.04	.08	.07	.12	.08	.12	.18	.17	.....	.92
.....	.....	.....	.....	.....	.....	.....	.....	.....	5.95
.....	.....	.09	.....	.....	.19	.....	.....	.....	.....
.....	.....	.09	.....	.....	.17	.....	.....	.....	4.50
.....	.10	.05	.17	.33	.....	.....	.....	.....	.....
.....	.10	.05	.16	.30	.....	.....	.....	.....	.....
.....	.002	.001	.01	.01	.....	.....	.....	.....	.....
.....	.002	.001	.004	.004	.....	.....	.....	.....	.....
.....	.....	.05	.....	.....	.....	.....	.....	.....	.....
.....	.....	.04	.....	.....	.....	.....	.....	.....	.....
.....	18.18	34.14	26.24	24.39	11.90	9.04	13.09	5.83	.....
71.03	61.54	41.61	29.70	22.09	16.43	9.97	6.90	11.24	.....
71.03	61.06	41.35	29.52	22.32	16.00	9.82	9.45	7.68	.....
.....	.20	.59	.52	.43	.13	.48	.55	.15	.....
1.11	.91	.57	.42	.39	.29	.14	.09	.18	.....
1.11	.90	.57	.42	.39	.27	.19	.28	.16	.....
.....	4.55	.....	1.54	.....	.....	.....	.....	.....	.....
1.84	.56	.15	.08	.....	.....	.....	.....	.....	.....
1.84	.60	.15	.16	.....	.....	.....	.....	.....	.....
.....	.14	.....	.02	.....	.....	.....	.....	.....	.....
.01	.01	.004	.001	.....	.....	.....	.....	.....	.....
.01	.01	.004	.002	.....	.....	.....	.....	.....	.....
.....	86.37	54.05	77.16	68.60	95.23	112.13	103.11	72.89	69.57
98.71	94.49	80.60	76.82	73.00	76.07	76.34	95.40	140.44	122.45
98.71	94.39	79.70	76.83	72.57	77.91	82.06	98.58	95.97	85.37
.....	1.41	.73	1.50	1.69	3.70	3.49	9.24	1.80	3.67
2.00	1.51	1.32	1.21	1.59	1.68	1.65	2.18	4.83	4.47
2.00	1.51	1.30	1.22	1.60	1.87	1.94	5.10	2.83	3.91
.....	.....	.....	.08	.....	.....	.31	.....	.....	.....
.....	.....	.....	.07	.....	.....	.25	.....	.....	.....
.....	.05	.09	.....	.75	.58	.31	1.05	.....	.....
.....	.....	2.84	3.09	1.52	3.97	1.81	1.64	.....	.....
4.61	3.71	3.71	3.98	3.93	2.32	2.75	.....	11.24	.....
4.61	3.67	3.68	3.93	3.69	2.48	2.60	.68	3.84	.....
.....	.....	1.55	1.00	.004	2.93	.55	1.47	.....	.....
.59	.77	.88	.94	1.11	1.04	.43	.....	1.89	.....
.59	.76	.90	.95	1.00	1.22	.45	.61	.65	.....
.....	.....	.....	1.06	.....	4.08	.....	.....	.....	.....
.....	.47	.64	.54	.75	.96	1.26	.....	5.13	.....
.....	.46	.61	.58	.65	1.35	1.00	.....	1.44	.....
2.53	1.86	2.11	1.70	2.10	1.73	.63	.....	5.13	.....

TABLE XX.—*The relation of certain specified diseases to the several*

Names of diseases.	Total.	Arms of service.						
		Infantry.	Calvary.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other.
Pneumonia and results.									
Admissions:									
Officers	2.07	2.29	3.44	3.44					
Enlisted men	3.99	3.75	4.79	2.60	8.54	.83	2.43	6.86	1.17
Total	3.88	3.67	4.73	2.66	7.75	.69	2.05	6.86	1.01
Noneffectiveness:									
Officers	.19	.15	.28	.53					
Enlisted men	.38	.35	.43	.30	1.73	.12	.14	.53	.07
Total	.37	.34	.42	.32	1.57	.10	.12	.53	.06
Deaths:									
Officers	.79	1.18	1.57						
Enlisted men	.62	.61	.48	.11	.78		1.78	1.48	1.07
Total	.64	.65	.55	.10	.69		1.43	1.48	.88
Discharges:									
Enlisted men	.01	.03							
Pleuritis and results.									
Admissions:									
Officers	2.07	1.15	3.44	1.72			5.29		2.39
Enlisted men	2.29	2.11	2.80	1.89	5.98	.83	.97	.81	1.56
Total	2.15	2.06	2.84	1.88	5.43	.69	1.64	.81	1.68
Noneffectiveness:									
Officers	.29	.22	.13	.85			.37		.26
Enlisted men	.13	.14	.15	.08	.25	.24	.02	.03	.07
Total	.13	.15	.15	.13	.23	.20	.07	.03	.09
Deaths:									
Enlisted men	.05	.03	.16						
Total	.05	.03	.15						
Discharges:									
Enlisted men	.07	.03	.16			.76			
Rheumatic fever.									
Admissions:									
Officers	4.59	4.58	4.59	6.87			5.29		4.77
Enlisted men	5.33	5.40	4.91	4.97	4.27	5.81	8.75	7.26	2.34
Total	5.28	5.35	4.89	5.09	3.88	4.86	8.21	7.26	2.69
Noneffectiveness:									
Officers	.65	.60	.99	1.06			.14		.64
Enlisted men	.57	.57	.54	.54	.39	.60	.68	.74	.33
Total	.57	.57	.57	.57	.35	.50	.60	.74	.37
Deaths:									
Enlisted men	.03			.22					
Total	.02			.20					
Discharges:									
Enlisted men	.07	.06	.11	.11					
Myalgia and muscular rheumatism.									
Admissions:									
Officers	47.32	64.15	49.31	61.86	16.81	4.22	15.87		14.32
Enlisted men	52.57	51.48	65.15	54.21	92.22	99.67	29.15	17.35	22.66
Total	52.25	52.17	64.38	54.69	85.27	83.97	27.09	17.35	21.48
Noneffectiveness									
Officers	2.55	3.59	2.92	2.12	1.75	.02	.49		1.57
Enlisted men	1.73	1.75	1.97	2.34	2.54	2.09	1.36	.30	.44
Total	1.78	1.87	2.01	2.32	2.47	1.85	1.23	.30	.60
Discharges:									
Enlisted men	.76	.70	.69	1.41	1.56	.76	.44	.37	.36
Other rheumatisms.									
Admissions:									
Officers	20.22	29.21	14.91	24.06			15.87		9.55
Enlisted men	19.14	19.64	22.73	17.63	23.91	16.61	16.03	13.31	7.03
Total	19.20	20.17	22.35	18.05	21.70	13.88	16.01	13.31	7.38
Noneffectiveness:									
Officers	2.17	3.08	2.99	1.72			.77		.45
Enlisted men	1.37	1.45	1.69	1.09	1.34	.84	.80	.95	.64
Total	1.41	1.54	1.75	1.13	1.21	.70	.80	.95	.61
Discharges:									
Enlisted men	.88	1.10	.75	.76	2.34	.76	.89		.71

arms of the service and ages of individuals, etc.—Continued.

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	.....	.....	1.54	1.52	1.98	3.62	3.27	5.83	.....
4.61	3.97	3.96	3.72	4.09	2.95	5.50	6.90	11.24	.....
4.61	3.92	3.83	3.61	3.84	2.86	5.20	5.40	7.68	.....
.....	.....	.....	.09	.14	.10	.34	.33	.65	.....
.41	.32	.40	.36	.55	.29	.51	.33	.74	1.06
.41	.32	.39	.34	.51	.27	.48	.33	.68	.32
.....	.....	.....	.....	.....	1.36	1.24	1.12	3.99	.....
.84	.56	.37	.54	.60	1.16	1.26	2.10	5.13	18.52
.84	.55	.35	.50	.52	1.18	1.25	1.63	4.31	4.50
.....	.....	.....	.....	.15	.....	.....	.....	.....	.....
.....	.....	.....	4.63	1.52	.....	7.23	1.64	.....	.....
.92	1.88	1.66	2.45	3.11	2.32	4.47	2.30	.....	.....
.92	1.86	1.60	2.57	2.96	2.10	4.91	2.03	.....	.....
.....	.....	.67	.04	.15	.....	1.17	.01	.....	.....
.03	.13	.10	.17	.13	.09	.20	.04	.....	.....
.03	.13	.12	.17	.13	.08	.35	.03	.....	.....
.....	.05	.05	.08	.....	.....	.31	.....	.....	.....
.....	.05	.04	.07	.....	.....	.25	.....	.....	.....
.....	.14	.09	.....	.....	.....	.....	.....	.....	.....
.....	.....	4.27	4.63	1.52	5.95	5.42	4.91	5.83	17.39
6.46	5.85	4.62	4.48	4.91	6.53	6.88	10.34	11.24	.....
6.46	4.63	4.61	4.49	4.58	6.48	6.65	8.10	7.68	12.20
.....	.....	.39	.42	.88	.68	.86	.45	1.61	.60
.52	.65	.47	.54	.45	.75	.62	1.09	.40	.....
.52	.64	.47	.53	.49	.75	.66	.83	1.20	.42
.....	.....	.05	.....	.....	.....	.....	.....	.....	18.52
.....	.....	.04	.....	.....	.....	.....	.....	.....	4.50
.....	.09	.05	.....	.15	.19	.....	.....	.....	.....
.....	36.36	21.34	40.12	27.44	67.46	68.71	63.83	64.14	52.17
21.22	41.14	45.37	54.31	62.03	80.70	85.63	133.33	185.39	61.23
21.22	41.09	44.55	53.57	58.67	79.42	82.92	104.65	105.56	54.88
.....	1.23	.64	.82	1.56	5.32	2.73	4.51	2.70	8.31
.86	1.12	1.41	1.68	2.21	2.10	3.51	5.89	9.66	2.51
.86	1.13	1.38	1.64	2.14	3.31	3.39	5.32	5.08	6.58
.84	.23	.41	.46	1.05	1.93	2.83	4.21	20.51	18.52
.....	13.64	7.11	18.52	6.10	29.76	32.55	29.46	29.15	26.09
14.76	14.75	16.21	19.20	22.26	27.60	33.70	51.72	112.35	61.23
14.76	14.73	15.90	19.17	20.69	27.81	33.52	42.54	57.58	36.59
.....	.72	1.65	2.23	.24	3.63	2.84	2.87	3.03	3.28
.79	1.10	1.23	1.22	1.62	2.23	2.11	2.64	8.32	1.73
.79	1.10	1.25	1.27	1.48	2.36	2.22	2.74	4.84	2.82
.....	.65	.87	1.01	.45	1.35	1.26	4.21	5.13	.....

TABLE XX.—*The relation of certain specified diseases to the several*

Names of diseases.	Total.	Arms of service.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	Recruits.	All other.
Total rheumatism.									
Admissions:									
Officers	72.14	97.94	68.81	92.78	16.81	4.22	37.04	.....	28.64
Enlisted men	76.97	76.51	92.79	76.81	120.42	122.08	53.94	37.93	32.03
Total	76.74	77.69	91.62	77.83	110.85	102.71	51.32	37.93	31.55
Noneffectiveness:									
Officers	5.38	7.26	6.89	4.90	1.75	.02	1.38	.....	2.66
Enlisted men	3.66	3.77	4.21	3.96	4.28	3.53	2.85	1.98	1.41
Total	3.77	3.97	4.34	4.02	4.03	2.95	2.62	1.98	1.58
Deaths:									
Enlisted men	.03	.....	.....	.22	.....	.....	.....	.....	.....
Total	.02	.....	.....	.20	.....	.....	.....	.....	.....
Discharges:									
Enlisted men	1.71	1.87	1.55	2.27	3.90	1.52	1.33	.37	1.07
Hernia.									
Admissions:									
Officers	.69	.57	2.29	.....	.....	.....	.....	.....	.....
Enlisted men	2.30	2.65	2.16	2.96	2.56	2.49	.49	1.41	.....
Total	2.20	2.53	2.17	2.77	2.33	2.08	.41	1.41	.....
Noneffectiveness:									
Officers	.38	.13	1.63	.....	.....	.....	.....	.....	.....
Enlisted men	.20	.18	.23	.35	.24	.25	.001	.12	.....
Total	.21	.18	.30	.32	.21	.21	.001	.12	.....
Discharges:									
Enlisted men	1.03	1.16	.96	1.51	.....	.....	.44	.92	.....

arms of the service, and ages of individuals, etc.—Continued.

Ages—years.									
19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
.....	50.00	32.72	63.27	35.06	103.17	106.68	98.20	99.13	95.65
42.44	61.74	66.20	78.01	89.20	114.83	126.21	195.41	308.98	122.44
42.44	61.61	65.06	77.24	83.95	113.71	123.08	155.29	170.82	103.65
.....	1.95	2.68	3.46	2.68	9.57	6.43	7.83	7.34	12.19
2.16	2.88	3.11	3.44	4.27	6.09	6.24	9.62	18.38	4.25
2 16	2.87	3.09	3.44	4.12	6.42	6.27	8.88	11.11	9.81
.....	.....	.05	.....	.....	.....	.....	.....	.....	18.52
.....	.....	.04	.....	.....	.....	.....	.....	.....	4.50
.84	.98	1.33	1.47	1.65	3.47	4.09	8.41	25.64	18.52
.....	.....	.....	1.54	1.52	1.98	.....	.....	.....	.....
2.77	2.19	2.46	2.37	1.64	2.32	2.41	1.15	16.85	.....
2.77	2.16	2.38	2.33	1.63	2.29	2.02	.68	5.76	.....
.....	.....	.....	1.97	.33	.29	.....	.....	.....	.....
.08	.24	.20	.21	.13	.12	.21	.04	.71	.....
.08	.24	.19	.30	.15	.13	.18	.02	.24	.....
.84	1.12	.92	1.32	.75	.77	1.26	1.05	.....	.....

TABLE XXI.—*Showing the relation of certain specified diseases to*

[Annual rates for the period of three

Names of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
Cerebro-spinal fever.						
Admissions:						
Officers	.23	.24				
Enlisted men	.06	.07			.39	
Total	.07	.09			.38	
Noneffectiveness:						
Officers	.001	.001				
Enlisted men	.004	.001			.09	
Total	.004	.001			.09	
Deaths:						
Officers	.16	.17				
Enlisted men	.03	.04				
Total	.04	.06				
Chicken pox.						
Admissions:						
Enlisted men	.43	.58	.12		1.57	
Total	.40	.53	.11		1.54	
Noneffectiveness:						
Enlisted men	.01	.02	.003		.02	
Total	.01	.02	.003		.02	
Dengue.						
Admissions:						
Officers	.46	1.21				
Enlisted men	1.04	.94	.58	1.25	2.72	2.35
Total	1.00	.90	.57	1.22	2.69	2.32
Noneffectiveness:						
Officers	.01	.01				
Enlisted men	.02	.02	.01	.03	.07	.07
Total	.02	.02	.01	.03	.06	.07
Diphtheria.						
Admissions:						
Officers	.46	.48				
Enlisted men	.28	.29	.23	.25		
Total	.29	.31	.23	.24		
Noneffectiveness:						
Officers	.01	.01				
Enlisted men	.01	.01	.01	.002		
Total	.01	.01	.01	.002		
Deaths:						
Enlisted men	.01		.11			
Total	.01		.10			
Enteric fever.						
Admissions:						
Officers	3.91	4.12				
Enlisted men	5.11	4.84	5.21	5.52	4.67	8.62
Total	5.06	4.78	5.15	5.50	4.61	8.49
Noneffectiveness:						
Officers	1.14	1.20				
Enlisted men	.76	.70	.80	.89	.68	1.35
Total	.78	.74	.79	.89	.67	1.33
Deaths:						
Officers	.31	.33				
Enlisted men	.49	.49	.85	.45		
Total	.47	.47	.83	.45		
Discharges:						
Enlisted men	.03	.04				
Influenza.						
Admissions:						
Officers	152.32	150.84	88.89	282.05	193.54	157.88
Enlisted men	123.03	128.79	124.48	108.74	122.95	94.83
Total	124.81	130.80	124.12	109.56	123.80	95.75
Noneffectiveness:						
Officers	4.92	4.89	4.26	5.47	5.65	3.46
Enlisted men	2.16	2.19	2.45	1.89	2.38	1.84
Total	2.33	2.44	2.47	1.90	2.42	1.87
Deaths:						
Officers	.31	.33				
Enlisted men	.43	.40	.95	.34	.71	
Total	.42	.39	.94	.33	.70	

nativities and lengths of service in ratios per 1,000 of their mean strength.
years ending December 31, 1892.]

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All other.	Under 1.	1 and over.
								.23
							.15	.04
							.15	.05
								.001
							.02	.001
							.02	.001
								.16
							.07	.02
							.07	.03
						1.63	1.19	.24
						1.62	1.18	.22
						.04	.04	.01
						.04	.04	.01
								.47
.73	1.67	1.72	1.41	1.55	3.68		1.12	1.02
.73	1.63	1.71	1.40	1.54	3.57		1.11	.98
								.01
.02	.05	.12	.01	.05	.04		.03	.02
.02	.04	.12	.01	.05	.04		.03	.02
								.47
		1.72		3.09			.44	.24
		1.71		3.08			.44	.26
								.01
		.10		.08			.01	.01
		.10		.08			.01	.01
								.02
								.02
							12.20	3.75
8.75	3.34	5.16	4.23	10.82	7.35	3.26	8.23	4.36
8.72	3.27	5.13	4.21	10.77	7.14	3.24	8.26	4.32
							2.20	1.12
1.10	.58	.78	.51	1.54	.99	.48	1.19	.65
1.09	.56	.78	.50	1.53	.96	.47	1.20	.68
								.32
.67				1.41			1.42	.25
.66				1.41			1.41	.26
							.07	.02
750.00	214.28	250.00	500.00	333.33	125.00	222.22	48.78	154.30
111.52	93.64	99.83	100.00	120.55	121.33	97.07	150.10	116.26
113.37	96.41	100.85	101.13	121.54	121.42	97.97	149.49	119.05
36.95	8.80	9.58	9.59	1.82	.68	2.13	1.24	4.99
1.76	1.68	2.27	1.44	2.26	1.54	2.00	2.71	2.02
1.86	1.84	2.32	1.46	2.26	1.52	2.00	2.70	2.24
								.32
							.34	.46
							.34	.45

TABLE XXI.—*The relation of certain specified diseases*

Names of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
Measles.						
Admissions:						
Officers	1.15	1.21				
Enlisted men	6.27	9.18	1.04	1.60	1.95	2.35
Total	5.95	8.45	1.03	1.59	1.92	2.32
Noneffectiveness:						
Officers	.13	.14				
Enlisted men	.26	.38	.03	.06	.14	.05
Total	.25	.36	.03	.06	.14	.05
Mumps.						
Admissions:						
Officers	1.15	1.21				
Enlisted men	3.34	4.70	.93	.86	.78	4.70
Total	3.21	4.38	.92	.85	.77	4.63
Noneffectiveness:						
Officers	.04	.04				
Enlisted men	.11	.15	.03	.03	.01	.16
Total	.11	.14	.03	.03	.01	.16
Scarlet fever.						
Admissions:						
Officers	.46	.48				
Enlisted men	.24	.17	.23	.25	.39	
Total	.25	.20	.23	.24	.38	
Noneffectiveness:						
Officers	.03	.04				
Enlisted men	.02	.01	.02	.03	.03	
Total	.02	.01	.02	.03	.03	
Small pox.						
Admissions:						
Enlisted men	.10	.15				
Total	.10	.13				
Noneffectiveness;						
Enlisted men	.01	.01				
Total	.01	.01				
Deaths:						
Enlisted men	.02	.02				
Total	.02	.02				
Varioloid.						
Admissions:						
Enlisted men	.03			.25		
Total	.03			.24		
Noneffectiveness:						
Enlisted men	.001			.01		
Total	.001			.01		
Whooping cough.						
Admissions:						
Enlisted men	.19	.22	.23	.25		
Total	.18	.20	.23	.24		
Noneffectiveness:						
Enlisted men	.01	.01	.01	.01		
Total	.01	.01	.01	.01		
Erysipelas.						
Admissions:						
Officers	1.61	1.69				
Enlisted men	1.89	1.79	3.01	1.72	1.17	2.35
Total	1.87	1.78	2.98	1.71	1.15	2.32
Noneffectiveness:						
Officers	.20	.21				
Enlisted men	.09	.09	.13	.06	.07	.03
Total	.09	.10	.13	.06	.07	.03
Deaths:						
Officers	.16	.17				
Enlisted men	.04	.07				
Total	.05	.08				

to nativities and lengths of service, etc.—Continued.

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All others.	Under 1.	1 and over.
								1.17
3.64		3.44	1.41	3.09	3.68	1.63	20.76	2.64
3.63		3.42	1.40	3.08	3.57	1.62	20.64	2.53
								.13
.09		.16	.07	.15	.07	.04	.85	.11
.09		.16	.07	.15	.07	.04	.84	.11
								1.17
4.37				1.55		.82	8.82	1.97
4.36				1.54		.81	8.77	1.91
								.04
.22				.09		.02	.28	.07
.21				.09		.02	.28	.07
								.47
1.46		1.72		1.55			.37	.20
1.45		1.71		1.54			.37	.22
								.03
.04		.07		.06			.03	.01
.04		.07		.06			.03	.01
						.82	.22	.07
						.81	.22	.07
						.03	.03	.01
						.02	.03	.004
						.75		.03
						.74		.03
								.04
								.03
								.002
								.002
							.15	.20
							.15	.19
							.01	.01
							.01	.01
								1.64
1.46	3.34		2.82		3.68		1.93	1.87
1.45	3.27		2.81		3.57		1.92	1.86
								.21
.03	.24		.12		.08		.09	.08
.03	.24		.12		.08		.09	.09
								.16
							.07	.03
							.07	.05

TABLE XXI.—*The relation of certain specified diseases*

Names of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
Quinsy.						
Admissions:						
Enlisted men	.10	.10	.23		.39	
Total	.10	.09	.23		.38	
Noneffectiveness:						
Enlisted men	.003	.003	.005		.003	
Total	.002	.003	.005		.003	
Deaths:						
Enlisted men	.01		.11			
Total	.01		.10			
Tonsillitis.						
Admissions:						
Officers	18.84	19.13	22.22	25.64		
Enlisted men	40.34	42.97	31.24	35.96	42.80	45.45
Total	39.03	40.80	31.14	35.91	42.29	44.79
Noneffectiveness:						
Officers	.41	.39	1.76	.56		
Enlisted men	.59	.61	.53	.54	.63	.79
Total	.58	.59	.55	.54	.63	.78
Other specific febrile and acute infectious diseases.						
Admissions:						
Officers	.46	.48				
Enlisted men	.25	.39	.12			
Total	.26	.40	.11			
Noneffectiveness:						
Officers	.01	.01				
Enlisted men	.004	.01	.001			
Total	.004	.01	.001			
Bronchitis.						
Admissions:						
Officers	82.25	78.93	177.78	205.13	64.52	52.63
Enlisted men	83.47	89.23	83.99	62.59	87.16	78.37
Total	83.39	88.30	84.96	63.27	86.89	78.76
Noneffectiveness:						
Officers	3.07	2.55	17.15	29.69	.71	.72
Enlisted men	1.45	1.52	1.54	.99	1.53	1.36
Total	1.55	1.61	1.70	1.12	1.52	1.35
Deaths:						
Enlisted men	.03	.02	.11			
Total	.02	.02	.10			
Discharges:						
Enlisted men	.18	.18		.22	.71	
Pulmonary phthisis.						
Admissions:						
Officers	2.07	2.18				
Enlisted men	3.62	4.04	3.35	2.09	2.33	4.70
Total	3.53	3.87	3.32	2.08	2.31	4.63
Noneffectiveness:						
Officers	1.01	1.07				
Enlisted men	.86	.91	1.04	.57	.42	.77
Total	.87	.92	1.03	.57	.41	.76
Deaths:						
Officers	.63	.66				
Enlisted men	.62	.71	.53	.34	1.07	.72
Total	.62	.70	.52	.33	1.05	.70
Discharges:						
Enlisted men	1.86	2.01	1.90	1.23	.36	3.58
Pneumonia and results.						
Admissions:						
Officers	2.07	2.18				
Enlisted men	3.99	4.62	2.55	3.68	2.72	2.35
Total	3.88	4.40	2.52	3.66	2.69	2.32
Noneffectiveness:						
Officers	.19	.20				
Enlisted men	.38	.46	.23	.34	.14	.12
Total	.37	.43	.23	.34	.14	.12

to nativities and lengths of service, etc.—Continued.

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All others.	Under 1.	1 and over.
							.07	.11
							.07	.10
							.001	.003
							.001	.003
								.02
								.02
								19.20
55.39	30.10	43.03	32.39	43.28	36.77	25.29	61.04	35.15
55.24	29.41	42.74	32.30	43.08	35.72	25.10	60.67	33.99
								.42
.87	.34	.55	.46	.55	.46	.35	.94	.50
.87	.34	.55	.46	.54	.45	.35	.93	.50
								.47
							.52	.16
							.52	.21
								.01
							.01	.003
							.01	.004
	142.85				125.00	222.22	48.78	82.89
74.35	90.30	58.52	46.48	63.37	95.59	69.33	100.77	79.12
74.13	91.50	58.12	46.35	63.07	96.43	70.44	100.46	79.41
	3.52				4.79	3.65	.67	2.12
1.61	3.57	1.01	.78	1.18	1.34	1.23	1.74	1.38
1.60	3.56	1.00	.78	1.18	1.44	1.25	1.73	1.51
								.03
								.03
.67							.07	.20
								2.11
6.56	6.69	5.16			7.35	.82	4.97	3.29
6.54	6.54	5.13			7.14	.81	4.94	3.20
								1.03
1.90	.56	1.53			2.87	.02	.89	.85
1.89	.55	1.52			2.79	.02	.88	.86
								.64
1.34							.75	.59
1.33							.74	.62
4.00	6.11	1.58					2.51	1.70
								2.11
4.37	3.34	3.44	1.41	3.09		2.45	5.64	3.58
4.36	3.27	3.42	1.40	3.08		2.43	5.60	3.47
								.19
.26	.42	.31	.20	.16		.31	.54	.34
.26	.41	.31	.20	.16		.31	.54	.33

TABLE XXI.—*The relation of certain specified diseases*

Names of diseases.	Total.	Nativities.				
		American U. S.	Irish.	German.	English.	Canadian.
Pneumonia and results—Cont.						
Deaths:						
Officers	.79	.83	.....	.....	.....	.....
Enlisted men	.62	.55	.74	.67	1.07	.72
Total	.64	.59	.73	.70	1.05	.70
Discharges:						
Enlisted men	.01	.02	.....	.....	.....	.....
Pleuritis and results.						
Admissions:						
Officers	2.07	1.94	11.11	.....	.....	.....
Enlisted men	2.29	2.32	3.12	1.23	2.33	.78
Total	2.15	2.29	3.21	1.22	2.31	.77
Noneffectiveness:						
Officers	.29	.27	1.43	.....	.....	.....
Enlisted men	.13	.14	.11	.10	.08	.23
Total	.13	.15	.12	.10	.08	.25
Deaths:						
Enlisted men	.05	.07	.11	.....	.....	.....
Total	.05	.06	.10	.....	.....	.....
Discharges:						
Enlisted men	.07	.07	.....	.11	.....	.72
Rheumatic fever.						
Admissions:						
Officers	4.59	4.36	11.11	.....	.....	52.63
Enlisted men	5.33	5.54	4.40	5.28	3.50	5.49
Total	5.28	5.44	4.47	5.25	3.46	6.18
Noneffectiveness:						
Officers	.65	.66	.61	.....	.....	4.03
Enlisted men	.57	.60	.49	.62	.37	.56
Total	.57	.60	.49	.62	.37	.61
Deaths:						
Enlisted men	.03	.....	.11	.11	.....	.....
Total	.02	.....	.10	.11	.....	.....
Discharges:						
Enlisted men	.07	.07	.....	.11	.....	.....
Myalgia and muscular rheumatism.						
Admissions:						
Officers	47.32	45.52	111.11	25.64	64.52	52.63
Enlisted men	52.57	53.69	54.26	52.04	45.53	53.29
Total	52.25	52.95	54.85	51.91	45.75	53.28
Noneffectiveness:						
Officers	2.55	2.40	6.08	.98	16.51	.48
Enlisted men	1.73	1.75	2.01	1.67	1.23	1.61
Total	1.78	1.81	2.05	1.66	1.41	1.59
Discharges:						
Enlisted men	.76	.64	.95	1.23	.....	2.15
Other rheumatisms.						
Admissions:						
Officers	20.22	19.61	66.67	.....	32.26	.....
Enlisted men	19.14	19.78	21.52	19.27	12.84	13.32
Total	19.20	19.76	21.98	19.18	13.07	13.13
Noneffectiveness:						
Officers	2.17	1.97	11.34	.....	10.24	.....
Enlisted men	1.37	1.45	1.51	1.30	.73	.76
Total	1.41	1.50	1.61	1.29	.85	.75
Discharges:						
Enlisted men	.88	.86	1.06	.90	1.07	.....
Total rheumatism.						
Admissions:						
Officers	72.14	69.49	188.89	25.64	96.78	105.26
Enlisted men	76.97	79.01	80.17	76.58	61.87	72.10
Total	76.74	78.15	81.29	76.34	62.29	72.59
Noneffectiveness:						
Officers	5.38	5.03	18.04	.98	26.75	4.47
Enlisted men	3.66	3.80	4.00	3.59	2.34	2.93
Total	3.77	3.91	4.15	3.58	2.68	2.95

to nativities and lengths of service, etc.—Continued.

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All other.	Under 1.	1 and over.
								.80
2.00				1.41			.81	.58
1.99				1.40			.81	.60
								.02
								2.11
.73	1.67		4.23				1.78	2.25
.73	1.63		4.21				1.77	2.24
								.29
.07	.03		.45				.15	.12
.07	.03		.45				.15	.13
							.14	.03
							.13	.03
							.20	.03
							12.20	4.45
9.48	3.34	10.33	2.82	6.18	3.68	4.08	7.79	4.71
9.45	3.27	10.26	2.81	6.15	3.57	4.05	7.81	4.70
							.27	.66
.89	.30	.42	.09	.50	.11	.33	.87	.49
.88	.29	.42	.09	.49	.11	.33	.81	.50
								.03
								.03
.67							.20	.03
	142.85	250.00			125.00		12.20	48.00
39.36	36.79	53.36	49.29	44.82	36.77	52.20	41.53	55.33
39.25	39.22	54.70	49.16	44.61	39.29	51.82	41.35	54.80
	3.72	2.74			3.08		.37	2.59
1.89	.83	2.79	1.37	1.19	.49	1.18	1.14	1.88
1.88	.89	2.79	1.37	1.19	.57	1.17	1.14	1.93
.67				2.82		.75	.34	.87
								20.60
16.04	8.36	22.37	23.94	15.56	7.35	8.16	16.17	19.88
15.99	8.17	22.22	23.87	15.38	7.14	8.10	16.07	19.94
								2.22
1.01	.12	2.74	2.53	.53	.06	.27	1.15	1.42
1.00	.12	2.72	2.53	.53	.06	.27	1.14	1.48
.67		1.57	3.86				.81	.90
	142.85	250.00			125.00		24.39	73.05
64.87	48.50	86.06	76.06	66.46	47.79	64.44	65.49	79.92
64.68	50.65	87.18	75.84	66.15	50.00	63.97	65.24	79.43
	3.72	2.74			3.08		.63	5.47
3.78	1.25	5.96	3.99	2.22	.66	1.79	3.17	3.78
3.77	1.30	5.93	3.98	2.21	.73	1.78	3.15	3.91

TABLE XXI.—*The relation of certain specified diseases*

Names of diseases.	Nativities.					
	Total.	American U. S.	Irish.	German.	English.	Canadian.
Total rheumatism—Continued.						
Deaths:						
Enlisted men	.03	.....	.11	.11	.....	.....
Total	.02	.....	.10	.11	.....	.....
Discharges:						
Enlisted men	1.71	1.57	2.01	2.24	1.07	2.15
Hernia.						
Admissions:						
Officers	.69	.73	.....	.....	.....	.....
Enlisted men	2.30	2.52	1.50	2.58	2.33	2.35
Total	2.20	2.35	1.49	2.56	2.31	2.32
Noneffectiveness:						
Officers	.38	.40	.....	.....	.....	.....
Enlisted men	.20	.21	.17	.18	.32	.20
Total	.21	.23	.17	.18	.32	.20
Discharges:						
Enlisted men	1.03	1.04	.95	.79	1.07	1.43

to nativities and lengths of service, etc.—Continued.

Nativities.							Length of service—years.	
Scandinavian.	Scotch.	Swiss.	Austrian.	Danish.	French.	All other.	Under. 1	1 and over.
.....	.....	.....	.....	.....	.....	.....	.....	.03
.....	.....	.....	.....	.....	.....	.....	.....	.03
2.00	.....	1.57	3.86	2.82	.....	.75	1.36	1.80
.....	.....	.....	.....	.....	.....	.....	.....	.70
1.46	.....	.....	.....	3.09	.....	3.26	2.52	2.25
1.45	.....	.....	.....	3.08	.....	3.24	2.51	2.13
.....	.....	.....	.....	.....	.....	.....	.....	.38
.08	.....	.01	.....	.07	.....	.42	.22	.19
.08	.....	.01	.....	.07	.....	.41	.22	.21
.67	.....	1.57	.....	2.82	3.37	2.24	1.49	.92

TABLE XXII.—*Number of applicants for enlistment examined during the year 1892, with the number accepted, rejected on primary examination, and declined, and ratios per thousand.*

	White.		Colored.		Indians.*		Total.	
	Number.	Ratios per 1,000 white examined.	Number.	Ratios per 1,000 colored examined.	Number.	Ratios per 1,000 Indians examined.	Number.	Ratios per 1,000 examined.
Examined	22,692	1,000	2,107	1,000	213	1,000	25,012	1,000
Accepted	8,555	377	833	395	197	925	9,585	383
Rejected	13,366	589	1,201	570	15	70	14,582	583
Declined	771	34	73	35	1	5	845	34

*Including only applicants for enlistment as soldiers for the regular term of five years. In addition to these, 179 Indian applicants for enlistment as scouts were examined, of whom 177 were accepted and 2 were rejected.

TABLE XXIII.—*Causes of rejection among 25,012 recruits examined during the year 1892, with corresponding ratios per 1,000 of each race examined.*

Number examined	White, 22,692.				Colored, 2,107.			
Causes of rejection.	Rejected on primary examination.	Rejected on secondary examination.	Total.	Ratios per 1,000.	Rejected on primary examination.	Rejected on secondary examination.	Total.	Ratios per 1,000.
Malarial diseases	4	.....	4	.18	.....	.....	.....	.....
Enthetic diseases	322	13	335	14.76	101	2	103	48.88
Dietic diseases	348	.....	348	15.33	7	.....	7	3.32
Constitutional diseases	22	1	23	1.01	5	.....	5	2.37
Developmental diseases	994	15	1,009	44.46	96	2	98	46.51
Parasitic diseases	17	.....	17	.75	4	.....	4	1.90
Diseases of the nervous system	56	14	70	3.08	14	2	16	7.59
Diseases of the eye	1,985	18	2,003	88.27	136	.....	136	64.54
Diseases of the ear	203	11	214	9.43	3	1	4	1.90
Diseases of the nose	3	.....	3	.13	.....	.....	.....	.....
Diseases of the respiratory system	47	3	50	2.20	3	.....	3	1.42
Diseases of the circulatory system	519	33	552	24.33	48	.....	48	22.78
Diseases of the digestive system	745	25	770	33.93	63	4	67	31.80
Diseases of the lymphatic system	8	.....	8	.35	2	.....	2	.95
Diseases of the genito-urinary system	905	24	929	40.94	59	.....	59	28.00
Diseases of the locomotor system	409	7	416	18.33	63	.....	63	29.90
Diseases of the integumentary system	124	5	129	5.68	7	1	8	3.80
Results of injuries	132	9	141	6.21	17	.....	17	8.07
Over age	516	.....	516	22.74	38	.....	38	18.03
Under age	98	.....	98	4.32	23	.....	23	10.92
Minority	749	43	792	34.90	46	1	47	22.31
Over height	20	.....	20	.88	10	.....	10	4.75
Under height	164	.....	164	7.23	20	.....	20	9.49
Over weight and obesity	100	.....	100	4.41	9	.....	9	4.27
Under weight	756	1	757	33.36	18	.....	18	8.54
Under size	469	2	471	20.76	48	.....	48	22.78
Illiteracy	18	.....	18	.79	3	.....	3	1.42
Imperfect knowledge of English	530	1	531	23.40	10	.....	10	4.75
Married, or having dependent relatives	219	12	231	10.18	45	3	48	22.78
Discharged for disability or by order	15	24	39	1.72	.....	4	4	1.90
Deserters and ex-convicts	27	21	48	2.12	2	3	5	2.37
Moral depravity	150	1	151	6.65	8	.....	8	3.80
Character bad and doubtful	235	9	244	10.75	16	1	17	8.07
General unfitness and unclassified	2,457	4	2,461	108.45	277	2	279	132.42
Aggregate	13,366	296	13,662	602.06	1,201	26	1,227	582.34

TABLE XXIII.—*Causes of rejection among 25,012 recruits examined during the year 1892, with corresponding ratios per 1,000 of each race examined*—Continued.

Number examined	Indian, 213.				Total, 25,012.			
Causes of rejection.	Rejected on primary examination.	Rejected on secondary examination.	Total.	Ratios per 1,000.	Rejected on primary examination.	Rejected on secondary examination.	Total.	Ratios per 1,000.
Malarial diseases					4		4	.16
Enthetic diseases	4		4	18.78	427	15	442	17.67
Dietic diseases					355		355	14.19
Constitutional diseases					27	1	28	1.12
Developmental diseases	1		1	4.69	1,091	17	1,108	44.30
Parasitic diseases					21		21	.84
Diseases of the nervous system					70	16	86	3.44
Diseases of the eye	1		1	4.69	2,122	18	2,140	85.55
Diseases of the ear					206	12	218	8.72
Diseases of the nose					3		3	.12
Diseases of the respiratory system	3		3	14.08	53	3	56	2.24
Diseases of the circulatory system	1		1	4.69	568	33	601	24.03
Diseases of the digestive system	1		1	4.69	809	29	838	33.50
Diseases of the lymphatic system					10		10	.40
Diseases of the genito-urinary system					964	24	988	39.50
Diseases of the locomotor system	1		1	4.69	473	7	480	19.19
Diseases of the integumentary system					131	6	137	5.48
Results of injuries	1		1	4.69	150	9	159	6.36
Over age					554		554	22.15
Under age					121		121	4.84
Minority					795	44	839	33.54
Over height					30		30	1.20
Under height					184		184	7.36
Over weight and obesity					109		109	4.36
Under weight					774	1	775	30.98
Under size					517	2	519	20.75
Illiteracy					21		21	.84
Imperfect knowledge of English					540	1	541	21.63
Married, or having dependent relatives					264	15	279	11.15
Discharged for disability or by order					15	28	43	1.72
Deserters and ex-convicts					29	24	53	2.12
Moral depravity					158	1	159	6.36
Character bad and doubtful					251	10	261	10.43
General unfitness and unclassified	2		2	9.39	2,736	6	2,742	109.63
Aggregate	15		15	70.42	14,582	322	14,904	595.87

TABLE XXIV.—*Nativity of recruits accepted during the year 1892, with ratios per thousand accepted.*

Nativity.	White.		Colored.		Indian.		Total.	
	Number.	Ratios per 1,000 accepted.	Number.	Ratios per 1,000 accepted.	Number.	Ratios per 1,000 accepted.	Number.	Ratios per 1,000 accepted.
United States	5,523	576.21	823	85.86	197	20.55	6,543	682.63
England	300	31.30					300	31.30
Scotland	53	5.54					53	5.54
Wales	9	.94					9	.94
Ireland	897	93.58					897	93.58
Canada	215	22.43	3	.31			218	22.74
Other British possessions	8	.83					8	.83
France	21	2.19					21	2.19
Belgium	8	.83					8	.83
Holland	11	1.15					11	1.15
Denmark	96	10.02					96	10.02
Norway and Iceland	67	6.99					67	6.99
Sweden	153	15.96					153	15.96
Germany	880	91.81					880	91.81
Switzerland	72	7.51					72	7.51
Austria	80	8.35					80	8.35
Bohemia	15	1.56					15	1.56
Hungary	19	1.98					19	1.98
Poland	22	2.30					22	2.30
Russia	71	7.41					71	7.41
Italy	19	1.98					19	1.98
Other countries	16	1.67	7	.73			23	2.40
Total	8,555	892.54	833	86.91	197	20.55	9,585	1,000.00

TABLE XXV.—*Average height, weight and chest measure of 9,585 recruits*

Age.	Whole number examined.				Average height (in inches).			
	White.	Colored.	Indian.	Total.	White.	Colored.	Indian.	Total.
16	24	1	3	28	66.06	65.75	64.42	65.88
17	27	2	9	38	66.33	66.88	67.19	66.56
18	250	11	12	273	67.15	66.86	67.42	67.15
19	199	13	16	228	67.38	66.81	68.69	67.44
Under 20 (average 18.2)	500	27	40	567	67.14	66.80	67.65	67.16
20	209	13	8	230	67.62	66.40	67.69	67.55
21	1,888	163	39	2,090	67.43	67.14	68.71	67.44
22	986	91	22	1,099	67.61	67.14	68.10	67.58
23	699	66	14	779	67.63	67.56	68.65	67.64
24	623	49	10	682	67.61	67.17	69.45	67.61
20 to 24 (average 21.9)	4,405	382	93	4,880	67.54	67.19	68.55	67.53
25	543	49	10	602	67.44	67.14	67.35	67.41
26	579	80	7	666	67.38	67.33	69.89	67.40
27	459	46	7	512	67.36	67.88	68.21	67.42
28	360	35	15	410	67.43	67.09	68.55	67.44
29	309	21	7	337	67.28	67.71	68.57	67.34
25 to 29 (average 26.7)	2,250	231	46	2,527	67.38	67.39	68.45	67.41
30	126	15	7	148	67.75	67.83	67.00	67.72
31	190	31	1	222	67.51	67.05	69.75	67.45
32	142	18	2	162	66.98	66.58	69.88	66.97
33	144	13	2	159	67.29	68.29	69.63	67.40
34	84	15	.....	99	67.04	68.14	.....	67.22
30 to 34 (average 31.8)	686	92	12	790	67.34	67.44	68.15	67.36
35	72	11	3	86	66.92	66.16	68.13	66.86
36	67	10	.....	77	66.96	67.58	.....	67.04
37	60	9	1	70	67.33	67.40	68.00	67.34
38	54	8	1	63	67.30	66.41	68.00	67.20
39	48	4	.....	52	66.76	67.38	.....	66.80
35 to 39 (average 36.8)	301	42	5	348	67.05	66.93	68.08	67.05
40 to 49 (average 43 ?)	369	54	1	424	67.12	67.39	66.75	67.16
50 and over (average 51 ?)	44	5	.....	49	67.01	67.50	.....	67.06
Average 25.39	8,555	833	197	9,585	67.42	67.26	68.30	67.43

accepted during the year 1892 (white, 8,555; colored, 833; Indian, 197).

Average weight (in pounds).				Average chest measure (in inches).							
				White.		Colored.		Indian.		Total.	
White.	Colored.	Indian.	Total.	Expiration.	Inspiration.	Expiration.	Inspiration.	Expiration.	Inspiration.	Expiration.	Inspiration.
128.54	131.00	134.33	129.25	31.97	34.71	30.50	32.50	30.58	33.00	31.77	34.45
129.22	132.50	138.75	131.46	31.96	34.68	33.50	36.50	31.81	34.56	32.01	34.75
135.71	139.36	136.25	135.89	32.79	35.65	32.98	35.48	32.06	35.52	32.76	35.64
139.11	137.92	139.19	139.05	33.40	36.29	33.13	35.77	32.42	35.31	33.31	36.19
136.37	137.85	137.82	136.54	32.95	35.81	33.00	35.58	32.04	35.04	32.89	35.74
138.99	138.31	139.00	138.95	33.29	36.13	33.65	35.90	32.91	36.41	33.30	36.13
142.09	144.90	143.05	142.33	33.78	36.64	33.94	36.50	33.51	36.78	33.79	36.63
145.24	146.02	144.59	145.29	34.21	37.07	34.06	36.53	33.80	36.93	34.19	37.02
145.99	148.26	150.36	146.26	34.31	37.19	34.36	36.90	34.43	37.64	34.31	37.18
146.28	149.10	152.80	146.58	34.30	37.21	34.49	37.13	33.60	36.93	34.30	37.20
143.86	146.06	145.28	144.06	34.01	36.88	34.10	36.64	33.67	36.93	34.01	36.86
146.38	146.96	145.10	146.40	34.31	37.26	33.93	36.49	33.18	36.80	34.26	37.19
146.18	150.85	156.29	146.85	34.43	37.29	34.30	36.91	35.25	38.04	34.42	37.26
146.70	153.24	149.14	147.32	34.46	37.40	34.42	36.93	34.82	37.71	34.46	37.36
146.32	145.97	156.73	146.68	34.41	37.32	34.04	36.60	34.65	38.05	34.39	37.28
146.44	146.43	151.86	146.55	34.50	37.40	33.70	36.88	34.32	38.00	34.45	37.38
146.39	149.36	152.24	146.77	34.42	37.32	34.15	36.78	34.40	37.72	34.39	37.28
150.24	155.27	146.43	150.57	34.60	37.62	33.97	36.78	34.07	36.75	34.51	37.49
150.85	148.97	140.00	150.54	34.60	37.59	34.24	36.81	34.50	37.00	34.55	37.48
145.96	144.67	152.00	145.89	34.49	37.72	33.69	36.71	35.50	38.00	34.41	37.61
150.98	160.77	161.50	151.91	34.88	37.73	34.79	37.44	36.75	39.50	34.90	37.73
147.85	155.60	.....	149.02	34.49	37.41	34.62	37.07	.....	.....	34.51	37.36
149.38	151.90	149.33	149.68	34.62	37.63	34.23	36.92	34.79	37.44	34.58	37.54
144.21	147.55	154.00	144.98	34.17	37.03	33.30	35.68	35.00	37.83	34.09	36.89
151.01	149.90	.....	150.87	34.82	37.74	33.98	36.50	.....	.....	34.71	37.58
152.38	147.67	147.00	151.70	34.71	37.60	33.44	35.89	35.50	37.50	34.56	37.38
151.96	147.75	165.00	151.63	34.88	37.70	33.72	36.34	35.75	37.75	34.75	37.53
151.71	147.50	.....	151.38	34.96	37.77	33.88	36.38	.....	.....	34.88	37.66
149.94	148.17	154.80	149.80	34.68	37.54	33.63	36.11	35.25	37.75	34 56	37.37
150.19	154.93	167.00	150.83	34.92	37.78	34.83	37.36	35.00	38.00	34.91	37.73
152.95	152.80	.....	152.94	35.16	37.64	35.00	37.50	.....	.....	35.15	37.62
145.07	148.08	146.04	145.35	34.17	37.06	34.12	36.70	33.64	36.80	34.16	37.02

TABLE XXVI.—*Occupations of 9,585 recruits accepted during the year 1892.*

Occupation.	White.	Colored.	Indian.	Total.
Professional and commercial:				
Physician	1			1
Chemists	2			2
Druggists	39			39
Nurses	8			8
Dentists	3			3
Lawyers	7			7
Insurance agents	3			3
Real estate agent	1			1
Auctioneer	1			1
Newspaper men	6			6
Civil engineers and surveyors	8			8
Assayer	1			1
Actors	2			2
Property man	1			1
Artists	2			2
Draftsmen	4			4
Stenographers	7			7
Typewriters	2			2
Bookkeepers	52			52
Hotel clerks	3			3
Shipping clerk	1			1
Clerks	373	3	1	377
Musicians	202	11	1	214
Music teacher	1			1
Piano tuners	2			2
Salesmen and commercial drummers	36	3		39
Canvassers	3			3
Agents	4			4
Storekeeper	1			1
School teachers	57	5		62
Students and school boys	23		3	26
Photographers	12	1		13
Cotton tester	1			1
Interpreter			1	1
Catechist			1	1
Dealers and workers in food products:				
Butchers	103	1		104
Bakers	87	4		91
Cooks	81	24		108
Confectioners	9			9
Dairymen	7	1		8
Millers	9			9
Grocers	4			4
Oysterman	1			1
Fisherman	1			1
Iceman	1			1
Workers in liquors and tobacco:				
Brewers	4			4
Bottlers	3			3
Bartenders	7			7
Cigar makers	19			19
Tobacco stripper	1			1
Workers in cloth and clothing:				
Weavers	30			30
Spinners	14			14
Card grinders	4			4
Knitter	1			1
Shearsman	1			1
Loom fixer	1			1
Velvet finisher	1			1
Dyers	3			3
Tailors	80	1	5	86
Underwear cutter	1			1
Collar and cuff makers	3			3
Stocking dresser	1			1
Hatters	9			9
Furrier	1			1
Workers in leather:				
Tanners	3			3
Curriers	2	1		3
Morocco polishers	3			3
Shoemakers	73		1	74
Last makers	2			2
Saddlers	14	1		15
Harness makers	15		1	16
Whip maker	1			1
Building trades:				
Brickmakers	7	1		8
Bricklayers	23	3		26
Stonecutters	27			27
Stone polishers	4			4

TABLE XXVI.—*Occupations of 9,585 recruits accepted during the year 1892.*—Continued.

Occupation.	White.	Colored.	Indian.	Total.
Building trades—Continued.				
Stone masons	15			15
Masons	8			8
Carpenters	194	6	4	204
Lathers	5	1		6
Plasterers	7	1		8
Glaziers	2			2
Painters	182	4		186
Decorator	1			1
Paper hangers	8			8
Roofers	3			3
Galvanizer	1			1
Plumbers	35			35
Gas-fitters	7	1		8
Pipe-fitters	2			2
Steam-fitters	11			11
Furnaceman	1			1
Tiler	1			1
Fence maker	1			1
Fireproof worker	1			1
Cement finisher	1			1
Carriage and wagon makers	7			7
Wheelwrights	2			2
Carriage painters	3			3
Car builders	2			2
Ship carpenter	1			1
Spar maker	1			1
Bridge builders	5			5
Electricity and transportation:				
Electricians	7			7
Electric machinist	1			1
Telegraphers	30			30
Linemen	6			6
Motormen	2			2
Gripman	1			1
Car drivers	4			4
Conductors	8			8
Engineers (including stationary engineers)	72	3		75
Firemen	53	5		58
Brakemen	61			61
Oiler	1			1
Switch and yard men	5			5
Car inspector	1			1
Train dispatcher	1			1
Railroaders	32	5		37
Railroad clerk	1			1
Mail clerk and mail carrier	1	1		2
Express agent	1			1
Pipe liners	2			2
Printing trades:				
Printers and compositors	91	3	1	95
Lithographers	3			3
Electrotyper	1			1
Pressmen	5	1		6
Bookbinders	5			5
Paper-makers	11			11
Jewelry:				
Jewellers	5			5
Watchmakers	8			8
Watch-case turner	1			1
Clock repairer	1			1
Pearl worker	1			1
Engraver	1			1
Silver platers	2			2
Silver polisher	1			1
Mines, metals, and machinery:				
Quarrymen	3			3
Miners	72	5		77
Puddlers	15	11		26
Molders	39			39
Iron workers	25			25
Core makers	2			2
Brass workers	2			2
Brass finishers	7			7
Foundryman	1			1
Steel blower	1			1
Steel heaters	2			2
Boiler makers	11			11
Riveter	1			1
Stove maker	1			1
Stove mounters	2			2

TABLE XXVI.—*Occupations of 9,585 recruits accepted during the year 1892*—Continued.

Occupations.	White.	Colored.	Indian.	Total.
Mines, metals, and machinery—Continued.				
Tube worker	1			1
Nail maker	1			1
Screw maker	1			1
Chain maker	1			1
Wire drawers and workers	6			6
Nickel plater	1			1
Nickel polisher	1			1
Drillers	2			2
Machinists	105	1		106
Ax maker	1			1
Cutler	1			1
Tool grinders	3			3
File cutters	2			2
Filers	3			3
Tinners	18			18
Tinsmiths	18			18
Locksmiths	11			11
Key maker	1			1
Bell makers	2			2
Gunsmiths	2			2
Housesmith	1			1
Blacksmiths (*see also* Farriers)	86	7	3	96
Workers with horses:				
Veterinary surgeon	1			1
Farriers (*see* Blacksmiths)	15	1		16
Horse trainers	2	1		3
Liverymen	2			2
Jockeys	2			2
Hostlers and grooms	75	17		92
Teamsters, drivers, and coachmen	342	34		376
Horsemen	2			2
Riding teacher	1			1
Horse raiser			1	1
Agriculture and stock raising:				
Farmers	1,058	63	67	1,188
Gardeners	22			22
Florists	11	1		12
Ranchmen	3			3
Cowboys	3		2	5
Herders			1	1
Stockmen			4	4
Personal service and attendance:				
Barbers	66	10		76
Waiters	43	20		63
Stewards	3			3
Butlers	2			2
Valet	1			1
Servant	1			1
Laundryman	1			1
Elevator service	1			1
Unskilled laborers:				
Laborers	1,953	274	13	2,240
Porters	20	9		29
Longshoreman	1			1
Makers of furniture and other workers in wood:				
Cabinet-makers	14			14
Chair maker	1			1
Chair caner	1			1
Upholsterers	10	1		11
Broom makers	5			5
Brush makers	2			2
Basket makers	2			2
Mattress maker	1			1
Frame makers	3			3
Oilcloth printer	1			1
Carpet-layer	1			1
Sawyers	5			5
Turners	4			4
Wood polishers	6			6
Varnishers and finishers	4			4
Japanner	1			1
Lacquerer	1			1
Wood carver	1			1
Woodworkers	6			6
Wood moulder	1			1
Coopers	15		1	16
Lumbermen and loggers	11			11
Turpentine worker	1			1
Lumber inspectors	2			2

TABLE XXVI.—*Occupations of 9,585 recruits accepted during the year 1892*—Continued.

Occupations.	White.	Colored.	Indian.	Total.
Soldiers and sailors:				
Sailmaker	1			1
Sailors	64	5		69
Soldiers	1,770	282		2,052
Scouts			6	6
Indian police			2	2
Unclassified:				
Glass-blowers	3			3
Glass-beveler	1			1
Undertakers	2			2
Coffin maker	1			1
Box makers	5			5
Box cutter	1			1
Bag maker	1			1
Rubber workers	2			2
Sign painter	1			1
Rule makers	2			2
Powder maker	1			1
Pencil polisher	1			1
Polishers	7			7
Finishers	2			2
Packers	5			5
Watchman	1			1
Messengers	4			4
Sprinter	1			1
Carriage washer	1			1
Mill hands	6			6
Paver	1			1
Sand buffers	3			3
House mover	1			1
Pipe layer	1			1
Billposter	1			1
Trunk makers	2			2
Mechanics	6			6
Apprentice	1			1
No occupation given	8		78	86
Total	8,555	833	197	9,585

REPORT OF THE PAYMASTER-GENERAL.

REPORT

OF

THE PAYMASTER-GENERAL.

WAR DEPARTMENT,
PAYMASTER-GENERAL'S OFFICE,
Washington, D. C., October 9, 1893.

SIR: I have the honor to submit the following as the annual report from this office for the fiscal year ended June 30, 1893:

On July 1, 1892, public funds charged to officers of the pay department aggregated	$1,068,732.12
They received during the fiscal year 1893:	
From the United States Treasury	14,071,415.61
From soldiers' deposits	282,248.04
From Army paymasters' collections	317,055.98
Total receipts during the year	15,739,451.75

This sum is accounted for as follows:

Expended on account of pay of Army	$13,058,021.08
Expended on account of pay of Military Academy	207,132.46
Expended on account of Signal Corps (Treasury certificates)	469.84
Expended on account of pay of volunteers (Treasury certificates)	905,027.45
Surplus funds deposited to credit United States Treasurer	329,473.68
Paymasters' collections deposited to credit United States Treasurer	317,055.98
Balances charged pay department officers June 30, 1893	922,271.26
Total accounted for	15,739,451.75

DEPOSITS.

This report shows that the amount received from soldiers' deposits is still receding, being over $50,000 less than receipts from the same source during the preceding year. This is true notwithstanding the fact, that, in no inconsiderable number of cases, soldiers who desire to purchase their discharge have been required to make deposits solely with a view to bring themselves within the rule prescribed recently by the War Department for accomplishing such purchase. The deposit system is of no advantage to the Government unless it is the means of securing more faithful service. To the prudent soldier it affords an eminently safe and accessible means of utilizing his savings, which upon his discharge are restored to him with 4 per cent interest.

In this connection I venture to suggest the wisdom of opening to commissioned officers the deposit system, which is now confined to the enlisted men of the Army. It would tend to encourage economy by placing within easy reach an indisputably secure form of investment.

Such a privilege, it would seem, would be valuable, especially to officers at remote stations, while others at more accessible points might be led not to yield to the seductive and possibly disappointing promises of more tempting offers.

While yet serving as a paymaster myself conversations are recalled in which officers expressed themselves as wishing a deposit system could be instituted for them. The existing financial disturbances and uncertainties seem to make this an opportune time for considering this question.

PAY OF THE ARMY.

The amount expended as pay of the Army during the past fiscal year is $188,586.25 less than was expended on the same account the preceding year. A marked decrease is shown in the items of expenditure to soldiers when discharged. The amount required to repay deposits is visibly shrinking. During the past year there was an unusual number of soldiers discharged by purchase. In these cases the retained pay is largely diminished, no travel allowances are paid, and the credits for clothing balances are reduced.

It is also observed that the number of enlisted men who receive increased pay for length of service is decreasing; reënlistments are less frequent. Is not the soldier by profession disappearing?

With a larger list of retired enlisted men the disbursements to them are correspondingly increased. On July 1, 1892, the number of retired enlisted men was 102 greater than on July 1, 1891, and during the past fiscal year the number of retired enlisted men was increased 104.

There has also been a slight increase in the number of retired officers.

To the enlisted men of the Army on the muster rolls there was paid last year about $125,000 more than during the preceding year. This is due to the fact that the enlisted force of the Army was held during the past year more nearly up to the maximum of 25,000 men.

MILEAGE.

The amount disbursed last year on account of mileage was about $30,000 less than was consumed for the same purpose the preceding year. At the close of the last fiscal year there had been expended on mileage accounts chargeable to the appropriation for that year $174,225.32, leaving of the mileage fund at the close of the year an unexpended balance of $5,774.68. This balance was wholly consumed in July of the current fiscal year, and there are now on file in the office of the post paymaster in this city unsettled mileage accounts involving last year's appropriation aggregating something more than $2,000. An estimate has been submitted to the Secretary of War which it is hoped will result in authority to use a sufficient sum from the general fund, pay of the Army, to adjust these unsettled accounts.

Attention is invited to the usual analysis of mileage payments for the past fiscal year.

Mileage disbursements 1893, appropriation from July 1, 1892, to June 30, 1893.

Change of stations	$42,844.71
European travel	1,255.46
Recruiting duty	19,683.60
Boards of Examination to examine officers	9,965.82
Board of Ordnance and Fortifications	1,785.59
Ordnance Department: Gun construction; foundry, steel, powder, and proving-ground inspection	3,351.43

Inspection by officers of the Inspector-General's Department	$9,135.04
Inspection by other than officers of the Inspector-General's Department	8,859.79
Medical boards and inspection by medical officers	4,287.48
Military prison commission and inspection of military prison	823.85
Instruction and inspection of national guard	2,820.17
Retiring boards and officers retired and ordered home	3,026.16
Payment of troops	17,512.83
Treasurer and professors Military Academy: Military Academy duty	724.70
Courts-martial (to and from)	12,058.59
Returning from conducting prisoners and insane men	1,123.48
Boards of survey	602.83
Commanding generals and aides	7,875.95
Rifle teams	13,522.08
Instructions of Secretary of War—duty not defined by orders	4,691.08
On public business—duty not defined by orders	2,921.60
Duty at World's Columbian Exposition	4,589.70
Attending funerals of officers and other deceased officials	763.38
Total	174,225.32

MILITARY ACADEMY.

The superintendent of the Military Academy is entitled to the salary of a colonel. The acts of Congress providing for the support of the Academy appropriate for the superintendent, who is also an officer of the Army, such a sum as will, with his Army salary, give him the salary of a colonel.

For the current year and for several years past the additional sum appropriated for this purpose has been $500 annually, this being the difference between the salary of a lieutenant-colonel and a colonel. On the 1st of April, 1893, Lieut. Col. Wilson was relieved from duty as superintendent and was succeeded by Maj. Ernst. The sum required from the Academy fund to pay the present superintendent the salary of a colonel is $1,000 a year. Owing to this change in superintendents there resulted in the Academy fund for the past fiscal year a deficiency of $125, and in the same fund, from the same cause, there will be a deficiency of $500 in the current year. It is recommended that Congress be asked to provide for these deficiencies.

CHANGES.

During the past fiscal year the *personnel* of the Pay Department underwent many changes; five of its members were retired, and Col. William A. Rucker, Assistant Paymaster-General, died. These casualties made places for two new appointments, which have been filled. It is also suggestive of change to recall that, during the period covered by this report, by the death of those venerable officers of the retired list so long and honorably associated with the Pay Department, Brig. Gens. Brice and Brown and Lieut. Col. Henry Prince, there is left in the Army Register the name of one officer only who served as a paymaster earlier than the year 1861.

PAYMENTS TO THE ARMY.

The payments at the military posts have been acceptably effected. No public funds have been lost. There have been no material changes in the number of posts at which troops are paid nor in the method of effecting the payments. For over thirty years past the Pay Department has at no time had fewer paymasters than during the past fiscal year. And I again call attention to the needs of the department in the

way of clerical services. At points at which the largest disbursements are made such services are much needed, and it is recommended that Congress be asked to authorize the employment of such number of paymasters' clerks, not exceeding forty, as the Secretary of War may consider necessary. The laws now authorize the employment of thirty-five clerks, five more than one for each disbursing officer of the department. Three of these five are employed in the local offices in this city: one, each, in the office of the Chief Paymaster in New York and Chicago. Pay offices in Boston, Cincinnati, and Detroit have been discontinued.

RETIRED MEN.

I desire to call the attention to the complicated character of the accounts of that deserving class of enlisted men who have been retired. These men receive three-fourths of the "pay and allowances" to which they were entitled at date of retirement. They are paid monthly, and the three items of pay, rations, and clothing enter into every account. Their pay depends upon the rank held at date of retirement, arm of service when retired, and length of continuous service. Their rations are commuted invariably at 22½ cents per day. The allowance for clothing depends upon their rank, and arm of service when retired. The clothing allowance for all grades changes every year and not unfrequently twice a year. The complicated character of these accounts opens the door to error; it consumes time to state and follow them through to a final settlement in the Treasury Department. There would seem to be no valid reason why a soldier retired from the infantry should receive 20 cents less per month for clothing than his comrade of equal length of service retired from a cavalry organization. It would not be difficult to determine upon a fixed rate of pay for retired men that would be equitable, depending alone upon the rate of pay at date of retirement. It is recommended that an appeal be made to Congress to fix upon a rate of pay for these men, involving fewer items and less subject to change.

DETAINED PAY.

War Department General Orders, No. 63, of 1889, authorized courts-martial to sentence a soldier to have his monthly pay in whole or in part withheld, sums so withheld to be restored to the soldier upon his discharge from the service. Sums thus withheld are known as "detained pay." The terms of this order have been complied with, until recently a ruling of the Second Comptroller of the Treasury Department has been received, in which it is held that items of *detained pay* when repaid become properly a charge against the appropriation of the year in which the retention was made. As the officers of the pay department have in their charge funds but for three fiscal years, it will be impossible for them to restore items of detained pay which were withheld during years covered by lapsed appropriations. In such cases discharged soldiers can recover credits of detained pay only by applying to the Second Auditor of the Treasury Department. Payments will be delayed, and discharged men will have just cause to complain of bad faith as well as the delay and attendant expenses they are obliged to incur to recover items of pay withheld three years or more before their discharge. It is therefore recommended that Congress be asked to authorize the payment of credit of detained pay due discharged soldiers from the appropriation of the year in which the soldier is granted his discharge, as is now done in case of deposits and retained pay.

STOPPAGES.

During the fiscal year ending June 30, 1893, there were 316 stoppages made against officers, as follows:

By request of the—		
Quartermaster-General		$1,685.28
Commissary-General		32.39
Chief of Ordnance		627.39
Chief Signal Officer		2.36
Second Comptroller		267.67
By order of the Secretary of War		109.85
By disallowances in the Paymaster-General's office		2,661.02
Total		5,385.96
Of this amount there was—		
Collected	$2,649.64	
Withdrawn	2,385.14	
		5,034.78
Balance to be collected		351.18

CLERICAL FORCE.

It is gratifying to be able to repeat what has been offered in earlier reports in commendation of the clerks employed in this office.

I earnestly renew the representations that have been made as to the necessity for two additional clerks. It is very important that the settlements of the accounts of the pay-department officers should be most carefully made, and the results should be most promptly communicated to the respective officers. Overpayments left to be discovered in the Treasury Department examinations are apt to be less easily and satisfactorily adjusted than if pointed out in this office. It is desired to accomplish this work in this office only as completely and conclusively as it is felt it should be done.

Attention is invited to the statements appended exhibiting the condition of the appropriations and the expenditures of the individual officers of the pay department.

Very respectfully,

WM. SMITH,
Paymaster-General, U. S. Army.

The SECRETARY OF WAR.

Statement of the account of the pay department, U. S. Army, with the appro

Appropriations.	In account with the Treasury.				
	Balance in the Treasury July 1, 1892.	Amount of appropriations and transfer warrants.	Unexpended balances deposited.	Paymasters' collections deposited.	Repayments in settlement of accounts.
Pay, etc., of the Army, 1893		$13,299,149.82	$74,298.99	$171,337.90	$3.00
Pay of Military Academy, 1893		230,890.08			
Pay, etc., of the Army, 1892	$316,044.84		232,059.44	46,993.35	917.26
Pay of Military Academy, 1892	23,941.89		6,646.73		15.25
Pay, etc., of the Army, 1891	175,712.61		5,415.42	3,835.59	4.50
Pay of Military Academy, 1891	22,948.76		421.67		
Signal Service, pay, etc., 1891		4.00			
Pay, etc., of the Army, 1890 and prior years			5,657.41	357.23	4.39
Pay of 2 and 3 years' volunteers, 1871 and prior years					1,304.12
Bounty to volunteers, their widows and legal heirs, 1871 and prior years					484.92
Bounty to 15th and 16th Missouri Cavalry Volunteers		575.07			
Extra pay to officers and men who served in Mexican war		696.71			
3 months' pay proper, act of July 3, 1884		521.76			
CERTIFIED CLAIMS.					
Pay, etc., of the Army	590.95	53,533.03			
Signal Service, pay		481.84			
Pay of 2 and 3 years' volunteers	5,813.17				
Pay of 2 and 3 years' volunteers, 1890	400.00		63.14		
Pay of 2 and 3 years' volunteers, 1891	573.77	349.93			90.86
Pay of 2 and 3 years' volunteers, 1892		84,893.47			106.53
Pay of 2 and 3 years' volunteers, 1893		650,000.00			21.79
Bounty to volunteers, their widows and legal heirs	19,722.18				
Bounty to volunteers, their widows and legal heirs, 1890	2,000.00		5.00		10.64
Bounty to volunteers, their widows and legal heirs, 1891	33,777.13				119.10
Bounty to volunteers, their widows and legal heirs, 1892		55,000.00			10.56
Bounty to volunteers, their widows and legal heirs, 1893		375,000.00			
Bounty under act of July 28, 1866	2,414.91		182.54		
Bounty under act of July 28, 1866, 1890	220.04				
Bounty under act of July 28, 1866, 1891	7,648.35		250.00		100.00
Bounty under act of July 28, 1866, 1892			4,557.51		
Bounty under act of July 28, 1866, 1893		50,000.00			
Pay of volunteers, Mexican war		114.83			
Extra pay to officers and men composing the escort to the Mexican Boundary Commission		135.33			
Traveling expenses of 1st Michigan Cavalry		441.28			
Traveling expenses of California and Nevada Volunteers		531.25			
Rogue River Indian war		8.53			
Preventing and suppressing Indian hostilities		87.64			
TRANSFER ACCOUNTS.					
Pay, etc., of the Army, 1890 and prior years		1,006.72			
Pay of 2 and 3 years' volunteers, 1871 and prior years		5,427.46			73.96
Bounty to volunteers, their widows and legal heirs, 1871 and prior years		100.00			
Bounty under act of July 28, 1866		50.00			
Total	611,808.60	14,809,000.69	329,557.85	222,524.07	3,267.64

priations subject to its control during the fiscal year ending June 30, 1893.

In account with the Treasury.						Balance in the hands of paymasters June 30, 1893.	Total balances June 30, 1893.
Total.	Amount drawn by requisition.		Amount covered into surplus fund.	Total.	Balance in the Treasury June 30, 1893.		
	On pay department request.	On Treasury settlements.					
$13,544,789.71	$12,783,000.00	$68,947.26	.....	$12,851,947.26	$692,842.45	$800,141.49	$1,492,983.94
250,890.08	207,036.79	51.71	.....	207,088.50	23,801.58	27,045.14	50,846.72
596,014.02	65,000.00	23,700.76	.....	88,700.76	507,314.16	10,559.86	517,874.02
30,604.60	.....	.....	.....	.....	30,604.60	.....	30,604.60
184,968.12	2,000.00	2,463.34	180,504.78	184,968.12	.....	1,134.59	1,134.59
23,370.43	.....	.....	23,370.43	23,370.43	.....	.....	.....
4.00	4.00	.....	.....	4.00	.....	.....	.....
6,019.03	.....	.....	6,019.03	6,019.03	.....	.....	.....
1,304.12	.....	.....	1,304.12	1,304.12	.....	.....	.....
484.92	.....	.....	484.92	484.92	.....	.....	.....
575.07	575.07	.....	.....	575.07	.....	.....	.....
696.71	696.71	.....	.....	696.71	.....	.....	.....
521.70	521.70	.....	.....	521.70	.....	.....	.....
54,123.98	48,700.00	5,294.02	.....	53,994.02	129.96	1,516.38	1,646.34
481.84	465.84	16.00	.....	481.84	.....	.....	.....
5,813.17	89.91	.....	.....	89.91	5,723.26	.....	5,723.26
463.14	108.18	.....	354.96	463.14	.....	.....	.....
1,014.56	1,014.56	.....	.....	1,014.56	.....	.....	.....
85,000.00	85,000.00	.....	.....	85,000.00	.....	10,351.36	10,351.36
650,021.79	474,000.00	655.49	.....	474,655.49	175,366.30	46,626.75	221,993.05
19,722.18	899.99	.....	.....	899.99	18,822.19	.....	18,822.19
2,015.64	192.41	.....	1,823.23	2,015.64	.....	.....	.....
33,896.23	789.59	.....	33,106.64	33,896.23	.....	.....	.....
55,010.56	55,000.00	10.56	.....	55,010.56	.....	5,988.38	5,988.38
375,000.00	295,000.00	.....	.....	295,000.00	80,000.00	3,813.77	83,813.77
2,597.45	.....	.....	.....	.....	2,597.45	.....	2,597.45
220.04	.....	.....	220.04	220.04	.....	.....	.....
7,998.35	.....	.....	7,998.35	7,998.35	.....	.....	.....
4,557.51	.....	.....	4,557.51	4,557.51	.....	2,526.09	2,526.09
50,000.00	50,000.00	.....	.....	50,000.00	.....	12,529.13	12,529.13
114.83	114.83	.....	.....	114.83	.....	38.32	38.32
135.33	135.33	.....	.....	135.33	.....	.....	.....
441.28	441.28	.....	.....	441.28	.....	.....	.....
533.25	533.25	.....	.....	533.25	.....	.....	.....
8.53	8.53	.....	.....	8.53	.....	.....	.....
87.64	87.64	.....	.....	87.64	.....	.....	.....
1,006.72	.....	1,006.72	.....	1,006.72	.....	.....	.....
5,501.42	.....	5,501.42	.....	5,501.43	.....	.....	.....
100.00	.....	100.00	.....	100.00	.....	.....	.....
50.00	.....	50.00	.....	50.00	.....	.....	.....
15,976,158.85	14,071,415.61	107,797.28	259,744.01	14,438,956.90	1,537,201.95	922,271.26	2,459,473.21

Statement by appropriations of approved and suspended disbursements in paymasters' accounts during the fiscal year ending June 30, 1893, showing also balance of suspensions remaining June 30, 1892, removed during the fiscal year, and the balance remaining June 30, 1893.

Title of appropriations.	Disbursements.			Suspensions.			
	Total.	Approved.	Suspended.	Amount of suspensions on books June 30, 1892.	Total suspensions.	Amount of suspensions removed during fiscal year ending June 30, 1893.	Amount of suspensions remaining on books June 30, 1893.
Pay, etc., of the Army, 1893	$12,189,194.03	$12,185,800.04	$3,393.99		$3,393.99	$2,244.04	$1,149.95
Pay of the Military Academy, 1893	180,288.13	180,195.47	92.66		92.66		92.66
Pay, etc., of the Army, 1892	814,123.02	813,253.04	869.98	$2,885.89	3,755.87	2,828.53	927.34
Pay of the Military Academy, 1892	27,150.81	27,150.81					
Pay, etc., of the Army, 1891	6,339.15	5,078.00	1,261.15	551.62	1,812.77	1,344.11	468.66
Signal Service pay, etc., 1891	4.00	4.00					
Pay, etc., of the Army, 1890	874.78	874.78		66.81	66.81		66.81
Pay, etc., of the Army, 1890 and prior				6,480.13	6,480.13	10.60	6,469.53
Signal Service pay, 1890 and prior				70.34	70.34		70.34
Bounty to 15th and 16th Missouri Cavalry Volunteers	786.64	786.64					
Extra pay to officers and men who served in the Mexican war	881.50	881.50					
Three months' pay proper, act of July 3, 1884	859.39	859.39					
CERTIFIED CLAIMS.							
Pay, etc., of the Army	47,183.62	47,183.62					
Signal Service pay	465.84	465.84					
Pay of 2 and 3 year volunteers	197.62	197.62					
Pay of 2 and 3 year volunteers, 1890	76.26	76.26					
Pay of 2 and 3 year volunteers, 1891	1,060.45	1,060.45					
Pay of 2 and 3 year volunteers, 1892	79,224.12	79,224.12					
Pay of 2 and 3 year volunteers, 1893	427,373.25	427,373.25					
Bounty to volunteers, their widows and legal heirs	644.47	644.47					
Bounty to volunteers, their widows and legal heirs, 1890	200.64	200.64					
Bounty to volunteers, their widows and legal heirs, 1891	789.59	789.59					
Bounty to volunteers, their widows and legal heirs, 1892	55,460.40	55,460.40					
Bounty to volunteers, their widows and legal heirs, 1893	291,186.23	291,186.23					
Bounty under act of July 28, 1866, 1891	50.00	50.00					
Bounty under act of July 28, 1866, 1892	7,483.48	7,483.48					
Bounty under act of July 28, 1866, 1893	37,470.87	37,470.87					
Pay of volunteers Mexican war	76.51	76.51					
Traveling expenses of First Michigan Cavalry	441.28	441.28					
Traveling expenses of California and Nevada volunteers	533.25	533.25					
Rogue River Indian war	87.64	87.64					
Preventing and suppressing Indian hostilities	8.53	8.53					
Extra pay to officers and men composing the escort to the Mexican Boundary Commission	135.33	135.33					
Total	14,170,650.83	14,165,033.05	5,617.78	10,054.79	15,672.57	6,427.28	9,245.29

Statement showing the balance in the hands of each disbursing officer of the Pay Department, U. S. Army, on the 1st of July, 1892, the amount remitted to each from the United States Treasury, or turned over by other agents during the fiscal year ending June 30, 1893; the amounts accounted for by accounts and vouchers of expenditures, or by transfer or replacement in the Treasury, and the balance remaining in the hands of paymasters to be accounted for in the next fiscal year.

Rank and name.	Balance in hands of each paymaster on June 30, 1892.	Remitted from the Treasury in the year ending June 30, 1893.	Received from other paymasters.	Received from soldiers' deposits.	Received from paymasters' collections.	Total received and to be accounted for.	Surplus funds deposited in the Treasury.	Paymasters' collections deposited in the Treasury.	Expenditures.	Transferred to other paymasters.	Balance in hands of each paymaster on June 30, 1893.	Total accounted for.
Colonels and assistant paymasters-general.												
Smith, Rodney [1]	$84,721.08	$1,182,000.00	$83,212.57	$2,685.00	$5,288.47	$1,357,907.12	$30,000.00	$5,288.47	$433,689.13	$888,929.52		$1,357,907.12
Rueker, William A.[2]	25,426.32	472,000.00	43,577.61	751.00	2,632.21	544,387.14	75,368.86	2,632.21	242,643.96	223,742.11		544,387.14
Terrell, C. M.	27,053.13	628,000.00	33,479.97	14,581.65	9,975.44	713,090.19	13,205.21	9,975.44	448,572.35	202,318.36	$39,018.83	713,090.19
Stanton, T. H	58,604.29	1,257,500.00	44,979.03	14,253.94	22,490.04	1,397,827.30	7,097.70	22,490.04	658,972.74	618,807.85	90,458.97	1,397,827.30
Lieutenant-colonels and deputy paymasters-general.												
Gibson, William R.[3]		70,000.00	12,000.00		1,005.40	83,005.40		1,005.40	19,357.59	62,642.41		83,005.40
Glenn, George E.	32,736.89	780,000.00	146,500.00	3,148.75	3,588.13	965,973.77		3,588.13	298,121.99	612,636.23	51,627.42	965,973.77
Canby, J. P	36,205.31	238,000.00	36,000.00	1,271.98	2,231.76	313,709.05	34,728.81	2,231.76	220,990.34	36,797.22	18,960.92	313,709.05
Candee, George W	10,054.69	718,000.00	245,924.52	9,939.25	5,187.55	999,106.01	75.00	15,187.55	668,810.29	292,289.39	22,743.78	999,106.01
Majors and paymasters.												
Carey, A. B	36,119.25	1,534,000.00	183,329.76	11,063.40	10,436.41	1,774,948.82	6,740.14	10,436.41	827,185.82	877,655.35	52,931.10	1,774,948.82
Coxe, F. M	22,397.44	214,000.00	36,505.33	2,809.00	3,303.95	279,015.72	11,387.47	3,303.95	226,812.92	12,590.51	24,920.87	279,015.72
Bates, A. E	33,279.02	480,000.00	648,946.00	9,329.50	8,846.73	1,180,401.25	1,334.90	8,846.73	662,567.01	485,118.46	22,534.15	1,180,401.25
Wilson, C. I	36,132.39	655,000.00		5,645.00	10,464.33	707,241.72	6,966.46	10,464.33	428,360.99	245,000.00	16,449.94	707,241.72
Eckels, W. H	41,102.69	229,000.00	188,000.00	7,827.61	12,623.72	478,554.02		12,623.72	404,185.86	23,269.33	38,475.11	478,554.02
Roche, J. R	35,773.32	445,000.00	37,296.94	7,763.35	12,470.87	538,304.48		12,470.87	429,473.16	96,360.45		538,304.48
Towar, A. S.	56,557.21	231,000.00	35,463.56	13,175.22	10,634.61	346,830.60	4,100.00	10,634.61	276,087.88	56,008.11		346,830.60
Maynadier, William M	9,806.38	18,000.00	245,000.00	6,849.00	5,492.40	285,147.78	2,745.37	5,492.40	262,934.77		13,975.24	285,147.78
Arthur, William	20,263.47	415,000.00	404,335.64	16,350.75	19,489.75	875,439.61	35,126.82	19,489.75	497,517.00	309,500.00	13,806.04	875,439.61
Keefer, J. B.	28,869.28		431,453.57	8,684.06	8,655.75	477,662.66		8,655.75	448,020.01	11,652.27	9,334.63	477,662.66
Wham, J. W	24,782.95	145,000.00	190.51	981.00	2,885.75	173,840.21	13,957.93	2,885.75	120,491.20	36,505.33		173,840.21
Sniffin, C. C.	12,124.85	57,000.00	184,187.37	7,860.00	9,272.85	[4]270,445.07	2,598.50	9,272.85	231,020.26	25,979.97	1,573.49	270,445.07
Baird, George W	22,612.57	102,000.00	429,003.43	10,988.35	11,411.48	576,015.83		11,411.48	400,054.30	109,317.63	55,232.42	576,015.83
Robinson, George F		255,000.00	34,497.22	13,485.00	8,443.34	311,425.56	3,507.22	8,443.34	234,967.95	16,000.00	48,507.05	311,425.56
Creary, William E.[5]	10,763.37		20,010.14	1,419.00	1,884.01	34,076.52		1,884.01	30,313.36	1,879.15		34,076.52
Dodge, F. S	24,456.99	255,000.00	12,500.00	6,835.00	9,727.50	308,519.49	3,791.79	9,727.50	277,648.71		17,351.49	308,519.49

[1] Retired January 3, 1893.
[2] Died January 22, 1893.
[3] Retired as colonel January 6, 1893.
[4] Stolen funds recovered and allowed by Court of Claims.
[5] Retired December 22, 1892.

Statement showing the balance in the hands of each disbursing officer of the Pay Department, U. S. Army, on the 1st of July, 1892, etc.—Continued.

Rank and name.	Balance in hands of each paymaster on June 30, 1892.	Remitted from the Treasury in the year ending June 30, 1893.	Received from other paymasters.	Received from soldiers' deposits.	Received from paymasters' collections.	Total received and to be accounted for.	Surplus funds deposited in the Treasury.	Paymasters' collections deposited in the Treasury.	Expenditures.	Transferred to other paymasters.	Balance in hands of each paymaster on June 30, 1893.	Total accounted for.
Majors and paymasters—Continued.												
McClure, Charles	$50,114.15		$420,457.07	$17,391.84	$19,926.37	$507,889.43	$1,306.00	$19,926.37	$441,478.04	$30,935.16	$14,243.86	$507,889.43
Witcher, J. S	22,609.36	$172,500.00	27,511.15	4,974.00	5,424.04	233,018.55		5,424.04	190,422.35	10,553.50	26,618.66	233,018.55
Whipple, C. H	37,341.77		756,506.75	12,444.90	11,956.58	818,250.00	347.50	11,956.58	759,405.03	22,759.11	23,781.78	818,250.00
Comegys, W. H	37,747.44	110,000.00	560,773.83	18,488.14	23,275.92	750,285.33	3,000.00	23,275.92	669,614.55	51,035.14	3,359.72	750,285.33
Tucker, W. F	78,039.45	1,425,000.00	62,673.61	13,219.54	15,105.33	1,594,037.53	60,000.00	15,105.33	1,417,045.11	44,990.93	56,896.56	1,594,037.93
Muhlenberg, J. C	36,150.61	1,064,415.61	17,490.93	22.06	335.40	1,118,414.61	6,405.27	335.40	1,011,268.78	6,231.20	94,173.96	1,118,414.61
Poole, D. C.[1]		20,000.00	13,781.89	400.00	977.10	35,158.99		977.10	25,362.92	8,818.97		35,158.99
Smith, George R	53,585.56	619,000.00	67,016.14	20,918.00	19,810.31	780,330.01		19,810.31	615,359.06	45,125.43	100,035.21	780,330.01
Baker, J. P	63,300.89	280,000.00	57,008.11	16,692.75	11,802.48	428,804.23	5,682.73	11,802.48	291,895.40	54,163.56	65,260.06	428,804.23
Halford, E. W.[2]												
Hamner, W. H.[2]												
Total	1,068,732.12	14,071,415.61	5,519,612.65	282,248.04	317,055.98	21,259,064.40	329,473.68	317,055.98	14,170,650.83	5,519,612.65	922,271.26	21,259,064.40

[1] Retired September 28, 1892.

[2] Not on duty as paymaster.

Statement showing the number of pay trips made, number of days consumed in travel, posts paid, and amount of field and office disbursements made by each disbursing officer of the Pay Department, U. S. Army, during the fiscal year ending June 30, 1893.

Rank and name.	No. of pay trips.	Days consumed.	No. of posts paid.	Miles traveled.						Payments.		
				Ambulance.	Stage.	Railroad.	Steamer.	Other conveyance.	Total.	In field.	In office.	Total.
Assistant paymasters-general.												
Smith, Rodney[1]	4	23	30	84	.....	5,508	4	.....	5,596	$100,188.82	$333,500.31	$433,689.13
Rucker, William A.[2]	4	12	6	.....	.....	1,290	16	.....	1,306	27,025.49	215,618.47	242,643.96
Gibson, William R.[3]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19,357.59	19,357.59
Terrell, Charles M.[4]	31	54	53	436	.....	9,396	.....	.....	9,832	136,078.96	312,493.39	448,572.35
Stanton, Thaddeus H.[5]	15	76	46	168	.....	15,738	.....	.....	15,906	263,688.01	395,284.73	658,972.74
Deputy paymasters-general.												
Glenn, George E.[6]	2	15	6	72	.....	3,375	.....	.....	3,447	32,305.83	265,816.16	298,121.99
Canby, James P.[7]	11	22	11	.....	.....	2,838	.....	.....	2,838	12,566.52	208,423.82	220,990.34
Candee, George W.[8]	15	123	56	146	.....	14,530	770	50	15,496	226,705.99	442,104.30	668,810.29
Paymasters.												
Carey, Asa B	30	60	95	142	.....	5,963	407	.....	6,512	134,587.80	692,598.02	827,185.82
Coxe, Frank M	28	66	29	54	.....	2,670	3,322	.....	6,046	84,622.33	142,190.59	226,812.92
Bates, Alfred E	12	122	74	73	.....	6,583	312	.....	6,968	313,436.23	349,130.78	662,567.01
Wilson, C. Irving	23	29	43	82	80	912	154	72	1,300	129,710.85	298,650.14	428,360.90
Eckles, William H	20	73	36	20	.....	9,625	1,136	76	10,857	160,531.08	243,654.78	404,185.86
Roche, James R	17	70	43	466	294	10,636	.....	.....	11,396	205,875.01	223,598.15	429,473.16
Towar, Albert S	10	82	29	1,645	.....	6,411	.....	67	8,123	173,175.58	102,912.30	276,087.88
Maynadier, William M	12	74	41	406	1,576	4,854	22	68	6,926	114,679.53	148,255.24	262,934.77
Arthur, William	14	119	54	1,218	.....	18,954	.....	.....	20,172	276,445.65	221,071.35	497,517.00
Keefer, John B	19	45	58	42	.....	7,199	268	.....	7,509	216,356.83	231,663.18	448,020.01
Wham, Joseph W	13	26	13	.....	.....	525	471	.....	996	47,227.80	73,263.40	120,491.20
Sniffen, Culver C	12	134	81	1,289	.....	9,979	1,730	.....	12,998	166,842.98	64,177.28	231,020.26
Baird, George W	12	51	36	312	294	6,959	359	14	7,938	159,140.01	240,914.29	400,054.30
Robinson, George F	5	49	22	1,070	.....	5,351	.....	.....	6,421	140,264.97	94,702.98	234,967.95
Dodge, Francis S	35	108	49	324	.....	13,481	192	.....	13,997	186,241.17	91,407.54	277,648.71
McClure, Charles	15	119	58	1,321	.....	16,904	.....	98	18,323	281,313.78	160,164.26	441,478.04
Witcher, John S	17	66	21	758	882	4,482	.....	.....	6,122	113,144.76	77,277.59	190,422.35
Whipple, Charles H	12	49	62	82	.....	5,553	296	.....	5,931	180,370.97	579,034.06	759,405.03
Comegys, William H	12	116	56	565	85	18,681	.....	.....	19,331	316,863.33	352,751.22	669,614.55
Tucker, William F	12	38	48	216	.....	1,756	3,760	.....	5,732	196,896.90	1,220,148.21	1,417,045.11

[1] Retired January 3, 1893.
[2] Died January 22, 1893.
[3] Retired January 6, 1893.
[4] Promoted from lieutenant-colonel January 6, 1893.
[5] Promoted from lieutenant-colonel January 22, 1893.
[6] Promoted from major January 3, 1893.
[7] Promoted from major January 6, 1893.
[8] Promoted from major January 22, 1893.

Statement showing the number of pay trips made, number of days consumed in travel, posts paid, etc.—Continued.

Rank and name.	No. of pay trips.	Days consumed.	No. of posts paid.	Miles traveled.						Payments.		
				Ambulance.	Stage.	Railroad.	Steamer.	Other conveyance.	Total.	In field.	In office.	Total.
Paymasters—Continued.												
Muhlenberg, John C											$1,011,268.78	$1,011,268.78
Smith, George R	19	54	25	225		5,840			6,065	$250,541.82	364,817.24	615,359.06
Baker, John P	11	96	31	1,600		6,870		110	8,580	224,915.08	66,980.32	291,895.40
Creary, William E	12	15	9	231		2,332			2,563	22,984.28	7,329.08	30,313.36
Poole, DeWitt C	3	3	6	1		247			248	7,273.98	18,088.94	25,362.92
Halford, Elijah W.[1]												
Total	457	1,989	1,227	13,048	3,211	225,442	13,219	555	255,475	4,902,002.34	9,268,648.49	14,170,650.83

[1] Appointed with rank from January 10, 1893. No payments.

REPORT OF THE CHIEF SIGNAL OFFICER OF THE ARMY.

REPORT

OF THE

CHIEF SIGNAL OFFICER.

WAR DEPARTMENT, SIGNAL OFFICE,
Washington, October 9, 1893.

SIR: I have the honor to submit the following report on the Signal Corps of the Army for the fiscal year ending June 30, 1893:

MILITARY TELEGRAPH LINES.

There are now thirty-three military posts and stations whose telegraphic connections with the great commercial systems of the country are over permanent lines, constructed or operated, either entirely or in part, by the Signal Corps of the Army. There is at present hardly a military post which has not a telegraph station either within its limits or at some convenient point speedy of access.

The military telegraph lines of the Signal Corps, whose operation devolves by law on the Chief Signal Officer, include, first, permanent lines for the purpose of maintaining communication with important military posts; second, flying telegraph lines which are organized and maintained with a view to their easy transportation and speedy utilization in connection with field operations. These lines during peace are usually operated for drill purposes, but on special occasions, as during this year in the Rio Grande Valley, they are established and temporarily worked in connection with important military operations; third, practice lines, primarily erected at military posts in order to promote instruction in telegraphy and signaling, but also serving in some instances to facilitate administration at posts covering extended areas.

The permanent telegraph lines operated by the Signal Corps, now aggregating about 700 miles in length, have been under the general management of Capt. Charles E. Kilbourne, Signal Corps, whose report forms Appendix A. The successful administration of Capt. Kilbourne appears in the extremely efficient condition of these lines as demonstrated by the unprecedentedly brief periods of interrupted communication during the past year.

Nearly 400 miles of telegraph line are under the immediate supervision of First Lieut. Frank Greene, Signal Corps, chief signal officer Department of Arizona, who has charge of all telegraph lines within the limits of that department in addition to his specific duties as a member of the departmental staff. The lines of this department are of unusual military importance, keeping as they do the great Indian reservations of Arizona and New Mexico under the eye of the department

commander. The section centering at San Carlos, Ariz., is not only indispensable to efficient and economical military operations in connection with that important agency, but also renders practically impossible any extended Indian outbreak.

The efficient administration of First Lieut. Frank Greene, Signal Corps, most cordially supported by Gen. Alexander McDowell McCook, department commander, has brought these lines into unprecedentedly serviceable condition. The double telegraphic outlet to commercial lines, north and south, from San Carlos has demonstrated its great utility by insuring almost uninterrupted communication through a wild and difficult region. The total interruption of telegraphic communication at stations on this division has averaged for each station less than thirty-four hours during the last fiscal year.

The system of military telegraph lines under First Lieut. Frederick R. Day, Twentieth Infantry, acting signal officer, with headquarters at Bismarck, N. Dak., have been efficiently managed during the year. This system comprises scattered lines in North Dakota, Montana, Oklahoma, Utah, Wyoming, and Texas.

The extension of the Burlington and Missouri River Railroad to Clearmont, Wyo., enabled this bureau to effect such a reconstruction of the military telegraph line to Fort McKinney, Wyo., as insures uninterrupted communication with that important military post. After consultation with Gen. John R. Brooke, commanding the Department of the Platte, whose energetic support has been at all times freely accorded, the line from Clearmont to Fort McKinney, 31 miles in length, was built May 5, 1893, under the supervision of First Lieut. Frederick R. Day, Twentieth Infantry, who for this purpose reported to the commanding general, Department of the Platte. This line was constructed largely of material recovered from the abandoned line between Powder River and Fort McKinney, some 50 miles in length. The present line from Clearmont to Fort McKinney, through its short length and other favorable conditions, promises uninterrupted communication. In accordance with the policy adopted by the Chief Signal Officer in the direction of local control, this line has been turned over to the commanding officer of Fort McKinney, who has full charge of its operation. Whenever the line is not required for strictly military purposes, commercial messages are transmitted over it under such restrictions as the commander officer of Fort McKinney may make, no tolls, however, being levied for such transmission.

Lieut. Day's remoteness from the several sections of the lines under his control has enhanced the difficulties of his administration, which, however, has been marked with energy and skill.

One of his lines, that extending from Fort Brown to Fort Ringgold, Tex., proved to be of great military importance during the late border troubles, when complications of an international character appeared possible on the lower Rio Grande. During the border troubles, however, this line—a single wire, having no outlet except at Brownsville—was frequently inoperative, sometimes by natural causes, but more frequently, as is probable, by malicious interruption through lawless persons who were interested in promoting disorder. Such interruptions, made in a few moments, necessitate hours, possibly days, of dangerous travel and arduous labor before the line is again in operation.

In order to insure telegraphic communication with a degree of reliability commensurate with the importance of this line, the Chief Signal Officer submitted with his last annual report a special estimate for

the construction of a second outlet, which plan, however, failed to commend itself to Congress. Later, the very threatening attitude of affairs obliged Gen. Frank Wheaton, commanding the Department of Texas, to telegraphically urge upon the Commanding General of the Army and the War Department the absolute military necessity of more extended telegraphic facilities, to be given by a second outlet in the construction of a telegraph line from Fort Ringgold to Fort McIntosh, Tex. These threatening conditions impressed Congress to a greater extent than the prior recommendations of the Chief Signal Officer, and as a result Congress appropriated $17,000 for the construction of the desired line, during the fiscal year ending June 30, 1894.

The not infrequent result of failure to act on the recommendations of the officer charged by law with special duties followed, for there was such delay in making the appropriation that the permanent line could not possibly be completed until a year after its pressing necessity was fully recognized.

The serious emergency, however, was provided for, at the suggestion of the Chief Signal Officer, by the costly expedient of concentrating and erecting all the flying telegraph line of the Army, some seventy miles in the aggregate. Although an expensive operation, yet it tided over the season of military operations, as is pointed out in that portion of this report referring to flying telegraph lines.

While the permanent telegraph lines under the control of the Chief Signal Officer of the Army are constructed primarily for military purposes, yet they secondly subserve commercial interests by affording speedy communication with business centers. The tariff charges for commercial telegrams over military lines are extremely low, ranging from 10 to 25 cents for ten words, so that the revenue from commercial messages is necessarily limited. Nevertheless, the volume of such business is so great that the income assumes respectable proportions.

There has been collected and turned into the United States Treasury during the fiscal year ending June 30, 1893, telegraph tolls of the sum of $1,964.69, while for the same period the additional sum of $4,262.73 was collected for tolls on account of the commercial telegraph companies and turned over to the proper officials. The total number of free messages transmitted over Government wires, consisting of Government, State, and other business, has been tabulated on lines under the supervision of the Chief Signal Officer and aggregate 36,530 with a tariff value of $3,885.67. The same proportion for other lines, under post commanders, would make the aggregate tariff value of free messages about $5,000, so that during the year the volume of business handled over military telegraph lines and calculated on its very low tariff aggregates not far from $15,000.

FLYING TELEGRAPH LINES.

The important part which electrical communications play in modern warfare emphasizes the necessity of developing efficient and supplementary methods for armies operating on a base away from the general telegraph system of the country. Special attention is now being given by the Signal Corps to the suitable equipment of its flying telegraph trains in all phases, from the connection, by means of such lines, of army headquarters with the permanent lines of the country to the provision for temporary telegraphic or telephonic communication between army, division, or even brigade headquarters, with all essential points, whether in camp or on battle line.

With this end in view, and with the approval of the Major-General Commanding the Army and the Secretary of War, flying telegraph trains equipped with the most modern appliances are in course of organization, each separate train having material for 15 miles of line. These trains, available for drill purposes, will be located at Fort Riley, Kans.; Fort Grant, Ariz.; Fort Sam Houston, Tex.; Fort Leavenworth, Kans., and at the Presidio of San Francisco, Cal.

Careful and detailed experimental tests are continued with a view of obtaining, in each flying telegraph train, maxima of efficiency and line material with minima of transportation and labor. Among other problems under consideration and experiment are those pertaining to various kinds of insulators, wire, batteries, and the most important one, of naked-wire telephony. Experiments have determined the inferiority of the bamboo lance as compared with those made of American cypress or similar woods.

The flying cable cart, devised by and constructed under the supervision of Capt. Charles E. Kilbourne, Signal Corps, has attracted much attention, as part of the Signal Corps exhibit at the World's Columbian Exposition; its lightness, ease of traction, strength, and other desirable qualifications have impressed all interested observers with its value. While the ordinary form of the cart is such that a single man can transport 2 miles of insulated double-conductor cable with the same rapidity and over the same ground that an infantry column can move, yet it has been deemed advisable to provide the cable cart with folding shafts so that it can be moved by a mounted man, thus increasing both the extent of the material carried and also its rapidity of transportation so that it can keep pace with a cavalry column.

The field telephone kit, wherewith a moving line can be kept in communication with its regimental, brigade, or division commander, though susceptible of improvement, is in quite satisfactory condition.

In order to obviate interruptions of telegraphic communication, which might result from the impracticability of making long spans with the light wire (No. 14) of the flying trains, light telegraph cable has been purchased for each train. This will be available either for use in streams of considerable width, or under conditions which render the ordinary aërial methods inadvisable.

PRACTICAL TELEGRAPH OPERATIONS.

The field or flying telegraph differs materially from a permanent line; the material, while being sufficiently strong to insure uninterrupted communication and withstand the vicissitudes of weather, must also be light enough to render easy its transportation with moving troops—say, material for 12 miles by a four-mule team. The wire supports must be such that they can be rapidly erected and dismounted, while the wire and insulators can be easily attached and detached from the lances without injury or deterioration. Moreover, the appliances for construction must be such that the line can be quickly put up over any kind of country. With such conditions to fulfill, theory must be supplemented by practice, since the erection of a flying line for drill purposes over chosen ground tests only in part the materials, methods, and appliances. Fortunately the past year has been marked by an extended practical application of the flying telegraph train of the Signal Corps that has not only tested its worth and fitness for field work, but also demonstrated its great practical utility to the Army.

On account of border troubles in the valley of the Rio Grande, which rendered prompt and speedy communication essential for successful military movements, Gen. Frank Wheaton, commanding Department of Texas, telegraphed the War Department in December, 1892, urging the importance of immediately extending the military telegraph line connecting Fort Brown and Fort Ringgold to Fort McIntosh, a distance of about 110 miles. Although this request was strongly and urgently supported by the Major-General Commanding the Army and approved by the Secretary of War, yet under the present system of appropriations it was impossible to secure money so as to build the line, except with a delay of twelve months. In this emergency the value and importance of the Signal Corps was obvious, since it was able to tide over this military necessity through its flying telegraph lines. The Chief Signal Officer immediately informed Gen. Wheaton that by drawing on other military departments he could construct for temporary use three sections of field telegraph line, some 60 miles in all. Gen. Wheaton telegraphed that the construction of such a flying line was important and desirable from a military standpoint. Steps were immediately taken by the Chief Signal Officer to assemble the material at Fort McIntosh, Tex., and for this purpose it was necessary to draw supplies from Fort Grant, Ariz.; Fort Riley, Kans.; Fort Leavenworth, Kans.; and New York City. Such expedition was used that within six days from the date of Gen. Wheaton's telegram Lieut. J. E. Maxfield, Signal Corps, left Fort Riley with twelve sergeants of the corps, and with this force, supplemented by details from troops in the Department of Texas, the work of erecting the flying line began on January 14, 1893, and within a few weeks telegraphic communication was established between Fort McIntosh and Carrizo, Tex., some 50 miles distant.

The slowness of construction arose entirely from delays in transportation. Eventually such scattered material, albeit of a heterogeneous character, was collected and used in extending the flying line from Fort McIntosh to Lopeña, a distance of about 74 miles. Four flying offices, operated by sergeants of the Signal Corps, were established on this line, thus enabling the commanding general of the Department of Texas to communicate in a few hours with any of his moving columns in that region. When the material on hand justified work, the average rate of construction was 5 miles per working day, which day was quite short both on account of the scarcity of water and also the enforced location of camps, which necessitated long marches to and from work of construction. The country built over, almost unpopulated, was covered with dense chaparral, largely of cacti, making the work of construction extremely difficult whenever the party quitted the winding and beaten roads. The work was eventually completed to the satisfaction of Gen. Wheaton, who complimented Lieut. Maxfield highly for the energy and efficiency displayed in the construction of the line. It may be added that although intended for temporary use this line continued in operation nearly eight months, thus subjecting it to extraordinary tests as to the character of materials used and the suitability of methods followed.

The construction of this line, expensive in its destruction of fine material and in the cost of accumulation and dispersion, afforded valuable practice for the Signal Corps, being actual fieldwork under conditions closely approaching war. It was asked for at short notice, the work was done in a section of the country remote from commercial centers, the deficiency or defects of implements or materials could not

be remedied; in short, the conditions, time, and place under which the line was erected were such as to fully test its fitness for active field service in time of war. The success of Lieut. Maxfield's work is a guaranty for future service of like character.

MILITARY BALLOONS.

The introduction of balloons in connection with field telegraph trains for the purpose of collecting and transmitting military information brings into special importance the question of aerial navigation. The utility and importance of balloons for obtaining military information during field operations were amply demonstrated in the last civil war, but like many other American ideas had to await recognition and development by military authorities of other nations. The United States, first to use balloons in war, as it was first to use the electric telegraph and signal appliances on the field of battle, has consequently seen these ideas adopted and improved by all other important military powers.

Improved methods of equipment, manipulation, and transportation have come with improved industrial and inventive methods, but as yet there have been no experiments sufficiently satisfactory to prove the advisability of replacing the captive balloon by free balloons, either for extended reconnoissance or as an instrument of offensive warfare.

The construction of a dirigible balloon, so as to have its movements under satisfactory control, may still be considered inconclusive, although the French war department has balloon apparata which have been propelled in any desired direction with considerable speed. Experiments have brought the use of a captive balloon, however, to such a degree of excellence that its utility in extended warfare is beyond question.

During the past fiscal year the project of adding military balloons to the flying telegraph train has been proceeded with under the plan made by the Chief Signal Officer, which was approved by the Commanding General of the Army and by the Secretary of War. An experimental captive balloon train is being organized, which, as a supplement to and in connection with the flying telegraph trains, will be operated with modern equipments, so that military information as to topography, the disposition and movement of troops, etc., may be collected photographically or visually. The drag rope, or captive cable of the balloon is an aërial double-conductor cable by which information can be transmitted by or sent to the occupants of the balloon.

With appropriations insufficient for extended experiments, the Chief Signal Officer was obliged to most carefully consider the different systems of ballooning now in operation, and has adopted, for the present, the English system of a captive skin balloon, provided with a double conductor, insulated captive cable, and inflated from portable cylinders containing hydrogen gas compressed under 120 atmospheres. After experimental drills the trained officers and men of the Signal Corps should be able to fill the balloon and make an ascent of half a mile in half an hour. From this coign of vantage the signal officer can communicate by telephone either with the train base or over the flying telegraph line with the commanding general. The balloon purchased for this purpose was constructed in Paris, under the supervision of First Lieut. William A. Glassford, Signal Corps, to whom was intrusted the entire details. In this work Lieut. Glassford displayed discriminating judgment and unremitting zeal.

It is hoped that the Signal Corps will be able to give a practical

exhibit at the World's Columbian Exposition of its captive balloon, aërial telephone cable, and connecting flying telegraph, under the supervision of Capt. Richard E. Thompson, Signal Corps, whose unremitting attention and zealous application to experimental balloon work, largely done by Capt. Thompson in extra hours, is deserving of notice.

LINES AND CABLES OF SAN FRANCISCO.

The telegraph lines and cables connecting the fortifications of San Francisco Harbor with headquarters Department of California have been interrupted since February last. Lieutenant C. H. Bonesteel, 21st Infantry, the acting chief signal officer of the Department of California represented the importance of this system of lines to public business, and recommended the entire military telegraph system of San Francisco Harbor be renewed with heavily armored cables, which could not be done with the present restricted appropriations of the Signal Corps; special estimates for this purpose are mentioned elsewhere. The most the Signal Corps can do with its present means is to spend a few hundred dollars annually, an expensive makeshift from which satisfactory results can not be expected.

POST TELEGRAPH LINES.

The Chief Signal Officer has fostered the construction and operation of practice telegraph lines within the limits of the larger military posts, and there are now in operation 76 of such lines. Interest in military signaling has thus increased, especially as the Morse, or American, telegraph code is the signal code of the Army. Many devote their leisure hours to acquiring a knowledge of telegraphy, which may enhance the value of their services while in the Army and be of benefit in civil life.

MILITARY SIGNALING.

The comprehensive report of Capt. Charles E. Kilbourne, Signal Corps, Appendix B, includes such details concerning military signaling as are of general interest.

The provisions of the Army Regulations which charge department commanders with responsibility for the efficiency of their commands in military signaling, with discretionary power to restrict post instruction therein to such particular months as are most suitable and convenient, have beneficially affected instruction in the line of the Army. Two hundred and eighty-eight officers and 1,388 men are reported proficient under paragraph 1761, Army Regulations; only one in six in this number, however, can receive telegraphic messages at a low rate of speed.

The efforts of the Chief Signal Officer to stimulate an interest in signaling by furnishing ample supplies for intercommunication on target ranges and in connection with summer encampments and marches, together with the establishment of well-equipped telegraph lines in the more important military posts, have contributed to increase practice and knowledge. The results, however, render it more than evident that the line of the Army has neither the time nor the inclination to acquire anything more than the rudiments of signaling. The average time given to signaling by each man in the line of the Army during the past year is about two hours, or about one-fourth of a working day.

In two military departments (Columbia and Dakota) the instruction during the whole year has averaged less than an hour for each man, and in only one department (California) has it even approximated to a half day, with an average of 5.2 hours.

While the present method of instruction occasionally results in a few acquiring sufficient knowledge of telegraphy to enable them to transmit or read messages sent over commercial telegraph lines at an ordinary rate of speed, yet it is very much to be doubted whether in case of a military exigency there could be drawn from more than one or two regiments of the line, officers and men competent to assume military supervision over telegraphic communications within their hearing.

It is evident, therefore, that expert signaling or telegraphy must devolve on the Signal Corps, whose restricted numbers and widely separated stations would render extended work impracticable in any sudden emergency. As a matter of professional caution, the chief signal officer has ascertained the names and recorded the degree of proficiency in telegraphy of such officers and men of the line as exhibit a marked degree of aptitude. In this manner the services of such can be promptly made available for commands needing experts for immediate service. Information of similar tenor has been obtained from the inspector-general's department, who have inspected methods and extent of instruction in military signaling in the line of the Army to the advantage of this corps.

SIGNAL EQUIPMENTS.

For the first time in its history the Army is equipped with sufficient instruments for ordinary practice and instruction.

The great importance of replacing the objectionable torch by a signal lantern, fit for reliable communication at distances up to 20 miles, is fully recognized, and recent experiments indicate an early and satisfactory solution of the problem.

The equipment of field glasses, which for years was sadly deficient in quantity, has been gradually increased, so that there is now about one field glass to every four line officers, instead of one to every fifteen, as in 1887. The inability of the Signal Corps to equip our scouting officers with field glasses, through lack of appropriation in past years, worked pecuniary hardship upon officers of the line who have been compelled to purchase private glasses at a high price for official use without even being permitted to procure them from the Signal Corps at cost. It appears indisputable that the Signal Corps should be able to furnish two field glasses to every company of cavalry and to such companies of infantry as are liable to be called upon for field service.

The field glass for ordinary issue is a six-lens, low-power glass, selected by a board of experts from about one hundred and fifty different patterns. It is as good a glass as can now be obtained for general use, but it is necessarily a compromise, since it is impracticable to obtain sharp definition, high power, good light, and extended field in any single glass; consequently these qualities have been combined with a regard to their importance in the order given above. There have also been purchased for special use some glasses of sharp definition and high power, 7 (*i. e.*, seven times the capacity of the unassisted eye); and efforts are being made to procure a free-hand field glass of extended field, moderate power, and good definition.

The material reduction in the price of aluminium has made it possible for the Signal Corps to purchase field glasses in frames of this metal. Their lightness (the weight being only half that of the ordinary metals) enables the observer to use the glass, free hand, for a considerable time without fatigue, and if these frames prove durable they will ultimately replace the brass.

SIGNAL SCHOOLS OF INSTRUCTION.

First Lieut. J. E. Maxfield, Signal Corps, has remained in charge of the instruction of enlisted men of the Signal Corps at Fort Riley, Kans., during the year. There has been no change in the course of instruction, which is divided into two parts, theoretical and practical, the former occupying four months and the latter two months. The course embraces electricity and telegraphy, the use, construction, and repair of telephones, military signaling and field surveying, including map-making, and is designed to make each enlisted man an expert signalist, a good telegraph operator, and to enable him to make rough field sketches of country about which information is desired.

The work of the school has been disarranged by the diversion of its instructor and students to more important duties of a practical character. In October, 1892, the entire detachment under Lieut. Maxfield was engaged in signal work in connection with the dedication exercises of the World's Columbian Exposition at Chicago. Later, the school detachment under Lieut. Maxfield were engaged in erecting and operating the flying field telegraph line in the Rio Grande Valley, as elsewhere set forth. Lieut. Maxfield has supplemented his work of instruction by conducting tests and experiments bearing on the equipment of the Signal Corps, and has performed his various duties in a most satisfactory manner. The field telegraph train at Fort Riley is insufficiently protected from the weather, but it is hoped that his recommendation for a suitable shed for the protection of the train and for the storage of reserved signal stores may be carried out.

Beneficial results have followed the intelligent and well-directed efforts of the instructor of military signaling at the school at Fort Leavenworth.

EXPERIMENTAL CITY LINES.

In connection with the dedication exercises of the World's Columbian Exposition, Capt. James Allen, Signal Corps, chief signal officer, Department of the Missouri, availed himself of the presence of Lieut. Maxfield and the Signal Corps detatchment from Fort Riley to plan and operate a line of military intercommunication comprising the greater part of the limits of Chicago. Under his orders a telegraph office was established near the headquarters of the commanding officer in the Mines building, and direct connection made with the Western Union telegraph office. This office was maintained during the entire time the troops were in Chicago and transacted a considerable amount of official business in connection with the movement of troops, furnishing supplies, etc. From the same office a military telegraph line was constructed to Washington Park and officers established at the saluting battery at a point midway down the line of formation of the troops and at the northwest corner of Washington Park.

This system of connecting the headquarters of different commands with the established line of commercial telegraph, together with con-

necting outpost cable system (telephone) with the telephone exchange of the city, will be important in connection with the employment of troops in the suppression of disorder in cities, as furnishing a certain and speedy means of obtaining accurate reports at headquarters as to the condition of affairs from all sections.

This system was established on the date referred to through the courtesy and hearty coöperation of Mr. R. C. Clowry, vice-president of the Western Union Telegraph Company, and other officials of that company.

In establishing the telegraphic means of communication in connection with the opening ceremonies of the World's Columbian Exposition, the necessity of trained men and permanent means of transportation was again made evident. Wagons could not be obtained quickly when needed, and there was no time to instruct men detailed from the companies to assist in the construction.

The Chief Signal Officer urgently recommends that a field train, fully equipped and furnished with a full complement of officers, men, and horses be stationed at some post in the Department of Missouri.

The present Signal Corps is necessarily a skeleton peace organization, but from time to time a company of cavalry or a detachment of unassigned recruits should be detailed for signal duty for the period of a year or more, so as to both insure familiarity with field conditions, and also afford opportunities to work out military problems involving speedy intercommunication under varying and difficult conditions. It is only by practice and experiment under conditions simulating actual hostilities, that any special corps of the Army can make itself fitted for its primary and destined occupation, that of making war. The Signal Corps is the only branch of the Army that has not now such opportunity, its small force of sergeants being eagerly and persistently sought for by the commanding officers of the more important posts of the Army.

EXTENDED HELIOGRAPH PRACTICE.

His important duties in charge of the systems of military telegraph lines in his department, have not prevented First Lieut. Frank Greene, Signal Corps, Chief Signal Officer, Department of Arizona, from displaying his activity and zeal in connection with the signal practice of the line, in camp and in field. Acting under the direction of his department commander, Gen. Alexander McDowell McCook, steps were taken to test the proficiency of the signal detachments at posts along the southern border of the department. Under Lieut. Greene's instructions a series of heliograph stations were simultaneously occupied from Mount Graham, near Fort Grant, westward to Table Mountain, thence southward to Fort Huachuca and thence eastward to Fort Bayard, an aggregate distance of 406 miles. Nine heliograph stations were occupied with a notice of a few days only and without preliminary reconnoissance. The orders were unannounced and unexpected. Many of the officers and men were unfamiliar with the points occupied, yet by means of the excellent heliograph map of the department and the accurate compass bearings furnished, communication was promptly opened at the exact time specified. Capt. F. K. Ward, First Cavalry, charged with the working superintendence of these lines is entitled to much credit for his successful supervision of this work, during which ranges from 26 to 66 miles were regularly worked over. The following officers are also deserving of credit in connection with this work: Lieuts.

Furlong and Hartman, First Cavalry; Lieuts. Byran, Hornbrook, and Winn, Second Cavalry; Lieuts. Ham, Keene, Jenks, and Leitch, Twenty-fourth Infantry.

The value and importance of Lieut. Greene's plan is obvious when it is considered that far the greater part of the Department of Arizona is covered by carefully determined and well selected points from which can be observed the movements of any command, Indian or white, whereby the department commander can be kept advised of any hostile movements, and thus act intelligently in operating against an enemy. It is pertinent to recall that the judicious distribution of heliograph stations in this region by Maj. Gen. Nelson A. Miles contributed materially to the successful and speedy issue of the Geronimo campaign.

TARGET RANGES.

All the target ranges of importance, are equipped with telephones or other preferred methods. The transmitters and receivers owned by the United States of earlier pattern, and in some instances difficult of manipulation, have been thoroughly overhauled during the year. Telephones and transmitters of the latest patterns are in use at the most important ranges.

As regards meteorological instruments, modifications have been made in forms of equipment, and such devices inaugurated as greatly facilitate the necessary observations. The adoption of the sling psychrometer and the compensated aneroid materially reduce and facilitate the work of the marksman, particularly on artillery ranges. The automatic register for the anemometer renders it possible to determine the velocity of the wind almost instantaneously; in from ten to thirty seconds, depending upon the velocity. While the register is expensive, yet it is now being supplied to all the larger artillery posts.

At the request of the Commanding General of the Army, a meteorological text-book for gunners of artillery has been prepared by Capt. Charles E. Kilbourne, Signal Corps, whose varied and efficient services, both as an artillery officer and also as a meteorologist, peculiarly qualified him for this technical work. These carefully prepared instructions met the approval of the Major-General Commanding the Army, and have been published during the year.

CABLES FOR HARBOR DEFENSES.

The obvious necessity of concerted action to successful harbor defense renders it an imperative duty to establish means of reliable and instant communication between all the important forts and harbor defenses of our great cities. The subject is one rather within the jurisdiction of the Board on Permanent Fortifications, but the Chief Signal Officer has thought it his duty to advance this matter by a special estimate for $20,000 to initiate such a system of military cables and connecting land lines in New York, Boston, and San Francisco as in the judgment of the board should be necessary.

WORLD'S COLUMBIAN EXPOSITION.

As full an exhibit of the working devices of the Signal Corps of the Army as was practicable, and of works of interest connected with the history of the Corps, has been made at the World's Columbian Exposition under the supervision of Capt. R. E. Thompson, Signal Corps.

The exhibit has elicited favorable comments from military experts and other interested visitors. The subject will be more freely treated in the next Annual Report, when Capt. Thompson shall have rendered his final detailed report after the close of the Exposition.

MILITARY COLLEGES.

Very great interest in signaling has sprung up among students at colleges having military instructors from the Army. Twenty-two such institutions have been as liberally supplied with signal appliances and material as a due regard for the interests of the Army would permit. Most of the supplies issued are of obsolete pattern, but even of these the demand far exceeds the supply.

THE NATIONAL MILITIA.

The Chief Signal Officer has lost no occasion to cultivate the most cordial relations with the militia and National Guard of the various States. This has been officially possible as the interest in signaling, which suddenly developed several years ago in the National Guard of several States, has proved to be permanent. Requests for signal equipments and for instructions as to methods of operation and management are frequent, despite the discouraging answers necessarily made. Information is promptly and fully given, but unfortunately the Signal Corps is not authorized under existing law to issue equipments for the use of the militia. Over half the States have asked for signal equipments and stores with the expectation and desire that the cost thereof should be charged against their allotment of the permanent appropriations made by Congress for the militia of the country. Despite the inability of the militia to procure signal equipments under the same regulations as govern the issue of other military stores signal corps have been organized in several States, although necessarily equipped at private expense.

EXAMINER'S DIVISION.

The report of the examiner's division, Appendix D, exhibits the very satisfactory condition of the division. It is very pleasant to report that the returns of the property accountability and money accounts are rendered with great regularity and a commendable degree of accuracy.

DISBURSING DIVISION.

The report of Capt. Robert Craig, Signal Corps, as disbursing officer, forms Appendix C, and contains such information regarding contracts and disbursements as is required by law and regulations. In addition to his duty as disbursing officer Capt. Craig has had charge of the general supply depot of the Signal Corps.

The labors of Capt. Craig have been exacting, as a large amount of clerical work has devolved on him. His own clerical labors have been supplemented by those of his storekeeper and assistant storekeeper, who have been diverted from their special duties to an extent prejudicial to the interests of the public service. A clerk for the disbursing officer is greatly needed, as Congress on the reorganization of the Signal Corps

provided only one-half the clerical force estimated for and needed. An estimate for an additional second-class clerk for duty with the disbursing officer has been submitted, and it is hoped that Congress will give the much-needed relief.

In this office fidelity, zeal, and application have characterized the clerical force, who are inadequate in numbers only. The two clerks of class one do work that, from its amount and importance, should insure increased pay, especially as under present conditions promotion is practically impossible for these clerks.

RECOMMENDED LEGISLATION.

While the act approved October 1, 1890, placed the Signal Corps of the Army on a permanent basis, yet the future of its officers is not encouraging. The great difference in rank between the Chief Signal Officer of the Army and that of the next officer of the corps, its major, renders it probable that in case of a vacancy the office of Chief Signal Officer would devolve upon some selected officer of the line. Denied promotion tends to the deterioration or prevents the complete military development of officers thus affected. Unless there is contemplated a general reorganization of the entire staff, without, of course, affecting the vested right for further promotion of any staff officer under the present system, the Chief Signal Officer, in justice to the junior officers of his corps, recommends independent legislation. It is apparent that no reorganization would be practicable which did not reduce the number of officers and decrease expense.

It is recommended that whenever the position of Chief Signal Officer becomes vacant the chief of the corps be thereafter a colonel, with two assistant chiefs, one with the grade of colonel and the other of major, to be promoted from the lower grades, and that the two inferior offices thus vacated should be discontinued. This would decrease the number of officers by one, and reduce the expenses of the corps by several thousand dollars annually, while affording that promotion which is one of the incentives to zealous and efficient service.

ESTIMATES.

After careful consideration the estimates for the regular expenses of the Signal Corps during the fiscal year ending June 30, 1885, were reduced below the current appropriation, the sum asked for being $21,500 against $22,000 for the fiscal year ending June 30, 1894. The new military telegraph line, about 112 miles in length, between Forts Ringgold and McIntosh, Tex., is being constructed under such favorable terms as leaves, from the permanent specific appropriation therefor, unexpended moneys sufficient for the maintenance of the line during the fiscal year ending June 30, 1894.

A. W. GREELY,
Chief Signal Officer.

The SECRETARY OF WAR.

APPENDIX A.

REPORT OF THE OFFICER IN CHARGE OF MILITARY TELEGRAPH LINES.

WAR DEPARTMENT, SIGNAL OFFICE,
Washington, D. C., October 5, 1893.

SIR: I have the honor to submit the following report relative to the maintenance and operation of the United States military telegraph lines during the fiscal year ending June 30, 1893:

The force employed in the operation of the Government lines consists of commissioned officers, sergeants of the Signal Corps, and civilian operators.

The following officers have continued in charge of their respective divisions during the year:

First Lieut. Frank Greene, Signal Corps, in charge Arizona division United States military telegraph lines, with station at Los Angeles, Cal., and First Lieut. Frederick R. Day, Twentieth Infantry, Acting Signal Officer, in charge northern division United States military telegraph lines, with station at Bismarck, N. Dak. These officers have ably and efficiently supervised the operations of the military lines under their control.

The following table shows the location and length of the military lines under the direct control of the Chief Signal Officer of the Army:

	Miles.
Bismarck to Fort Yates, N. Dak	65
Fort Custer to Custer Station, Mont	30
Fort Du Chesne to Price, Utah	87
Fort Brown to Fort Ringgold, Tex	100
Holbrock to Fort Bowie, Ariz	291

The following military telegraph lines connecting military posts with the commercial lines of the country, the material for the maintenance and operation of which is supplied by the Signal Corps, although the control and administration of the lines are vested in the post officials:

	Miles.
Fort McKinney to Clearmont, Wyo	31
Fort Supply to Woodward, Ind. T	15
Fort Bayard to Silver City, N. Mex	10
Fort Clark to Spofford Junction, Tex.*	10
San Antonio (department headquarters), Texas	1¼
Fort Wingate to Wingate Station, N. Mex	3
Fort Reno to Elreno, Okla	5¼
Fort Sill, Okla., to Rush Springs, Ind. T	28
San Francisco cable system	12¾
San Francisco land system	2¼

Sergeants of the Signal Corps have been detailed as operators, in addition to other military duties, at the following-named posts: Fort Snelling, Minn., Fort Sully, S. Dak.; Fort Wingate, N. Mex.; Fort Mason and Angel Island, Cal.; Headquarters Department of the East, Governors Island, N. Y.; Headquarters Department of the Columbia, Vancouver, Wash.; Headquarters Department of California, San Francisco, Cal.; Headquarters Department of Texas, San Antonio, and Headquarters Department of Arizona, Los Angeles, Cal.

Stations on the military lines where commercial business is transacted are, as a rule, in charge of sergeants of the Signal Corps; the great demand for signal sergeants, however, and the limited number available, makes it necessary to employ civilian operators at some points, usually transfer stations. The points at which such persons are employed are: Custer Station, Mont.; Elreno, Okla.; Edinburg and Santa Maria, Tex.; Lander, Wyoming; Price, Utah; Tiburon, Cal.; Valentine, Nebr.; Woodward, Ind. T.; Rush Springs, Ind. T., Clearmont, Wyo., and Bismarck, N. Dak.

* Telephone lines.

EXTRACTS FROM ANNUAL REPORTS OF OFFICERS IN CHARGE UNITED STATES MILITARY TELEGRAPH LINES.

Bismarck section. General repairs on this section were completed July 3, 1892, since which time the line has worked well. Its condition to-day is good and none but ordinary repairs will be necessary for another year.

Fort Custer section. This section has with ordinary repairs been maintained in good condition throughout the year.

Fort McKinney section. As stated in my last annual report, owing to the great difficulty of keeping the line connecting the post with Powder River in repairs, it was finally decided to abandon the line and with material recovered therefrom build a new line to Clearmont, Wyo., a station on the Burlington and Missouri River Railroad. With the assistance of troops from the post, the line, 31 miles in length, was completed May 5, 1893, under the supervision of First Lieut. F. R. Day, Twentieth Infantry, acting signal officer. (The commanding officer of Fort McKinney has control of the line and no tolls are charged for the transmission of messages.)

The arrangement with the officials of the Inland Telephone and Telegraph Company of Washington whereby official telegrams between the post of Fort Spokane and Davenport, Wash., were transmitted free of charge, in return for which the line was kept in repairs by the Government, was terminated in April, 1893, the labor involved in the arrangement and the urgent necessity of general repairs of the line not warranting its continuance.

Fort Washakie section: No changes have occurred on this section during the year. No tolls are collected and the post authorities are responsible for the condition of the line. Its condition is very bad and its rebuilding on iron poles a necessity. No action, however, will be taken in this direction until the ownership of the line is determined, this office being in correspondence with the Western Union Telegraph Company on the subject.

Fort Duchesne section: The condition of this line is only fair, but all repair work is well done, hence the line does not deteriorate rapidly. A large quantity of material was assembled on this line for repair purposes, but owing to the proposed abandonment of the post, the material was shipped to Clearmont, Wyo., and used in building the Fort McKinney line. If the post is abandoned at an early day, extensive repairs will not be required, while on the other hand, it will be difficult to maintain the line another winter without general repairs.

Reno-Sill section. This section extended from Fort Sill, via Anadarko and Fort Reno, Okla., to the line of the commercial telegraph at El Reno. The extension of the railroad to within 30 miles of Fort Sill rendered it advisable to build a line to the point nearest on the railroad; accordingly the portion of the line between Fort Reno and Anadarko was taken down and the material recovered used in constructing a new line connecting Fort Sill and Rush Springs, 28 miles in length. During the time occupied in building the new line, viz, from October 3 to 26, 1892, Fort Sill was without telegraphic communication. The short line between Fort Reno and El Reno is, and has been, in excellent condition. The portion of the old line between Fort Sill and Anadarko was maintained until April 14, 1893, when it was transferred to the Interior Department for the use of the Indian Bureau.

Fort Brown section. This section has continued to give efficient service during the year and is in fair repair. The extension of the line to Fort McIntosh, Tex., via Laredo, will add much to its value and unquestionably prove a factor in the settlement of the troubles along the Rio Grande.

Arizona division: The telegraph lines of Arizona and New Mexico have been maintained in a high state of efficiency, the aggregate total interruptions at all stations was but sixty-six days as compared with seventy-seven days in 1892, while the total number of days on which each station was cut off from department headquarters by the line being down on both sides of the station was twenty days eight hours to nineteen days twenty-one hours last year. This excellent record is the result of the hearty coöperation of the department commander, by whom details of troops have been made from time to time, when needed, for general repairs and the thorough patrolling of the various sections of the lines, which were performed, as a rule, under the supervision of Signal Corps sergeants.

Fort Stanton section: This section was carefully gone over in July, 1892, and all needed repairs made. Information has been received at this office that the coal plant at Carthage, N. Mex. (the transfer office for Fort Stanton), is about to be removed and the town abandoned by the railroad company. In case this action is taken it will be necessary to provide for a transfer office at some other point, possibly San Antonio, N. Mex., provided satisfactory arrangements can be made with the Western Union Telegraph Company.

Fort Apache section: A detail of troops from the post, under the supervision of a signal sergeant, made general repairs between Fort Apache and Summit, a distance of 35 miles; a number of bent poles were straightened and reset, poles were tamped

where necessary, and all branches and limbs of trees in contact with the wire trimmed; a number of trees liable to interfere with the line were cut down and removed. Particular attention was given to the crossing of Black River, where additional poles were put in to strengthen the line supports on the bank of the river. Twenty-four bad splices were cut out of the line. This portion is now in good condition.

San Carlos section: A sergeant of the Signal Corps, with a detail of troops, made general repairs of this section during July and August, 1892. A 40-foot mast was placed in position at the crossing of the San Carlos River. There is now a span at that place of 250 yards long, the lowest point in the curve of the wire being at least 30 feet above the water level. An intermediate support which had been used on this span, consisting of a tripod of iron poles and placed on a sand bar in the middle of the stream, was removed as endangering the span from driftwood during freshets. The support on the opposite bank of the river consists of a mast 40 feet high, made of iron poles, six poles at the butt and tapering to one pole at the top, the whole being firmly bound together by iron bands. This repair party also built a new loop at San Carlos.

Holbrook section. A detachment under the command of Lieut. H. O. Williams, Eleventh Infantry, with two Signal Corps sergeants and twenty enlisted men from the post of Fort Apache, well equipped with everything necessary to carry on the work, left Fort Apache October 17, 1892, for the purpose of rewiring the line between Fort Apache and Holbrook, which work was successfully accomplished as far as Mitchel's Ranch, 30 miles from Fort Apache, when the officer in command and the greater part of the detachment were ordered to return to the post to join their companies which had been ordered to change station. This action necessitated postponing the work until November 17, when a detail of men under the charge of Sergt. H. W. Chadwick, of the Signal Corps, resumed the work of rewiring the line. The loop constructed on wooden poles connecting the town of Snowflake, Ariz., with the military line was taken down and a new loop built on iron poles. The party reached Holbrook November 30. The old wire which was recovered was carefully coiled and stored at Cooley's (a repair station on the military line) and at other convenient points.

A two-conductor underground cable was laid in a wooden conduit across the target range at San Carlos on March 13 and 14 and placed in circuit with the main line, the overhead wire being removed. This action was necessary to avoid interruption by the breaking of the wire during target practice. This cable is 1,250 feet long.

Wooden poles are still in use on the line between San Carlos and Fort Grant. The line runs near the wagon road and much trouble is caused by the wagons striking the poles, which would knock off the brackets. These wooden poles have been in use a long time and are more or less decayed. There being a number of iron poles available for use stored at Fort Grant, together with other telegraphic material, it was proposed to replace the wooden poles during March, 1893, but, owing to other important matters, it has been impracticable to have the work performed, and it will now be postponed until some time this coming fall.

The following table shows the amount of cash receipts at each station on the United States military telegraph lines during the year:

Arizona division:		
Carthage, N. Mex	$57.21	
Holbrook, Ariz	58.42	
Fort Apache, Ariz	56.77	
Fort Bowie, Ariz	13.48	
Fort Grant, Ariz	63,59	
Fort Stanton, N. Mex	60.35	
Fort Thomas, Ariz. (to November 19, 1892)	17.55	
San Carlos, Ariz	118.82	
Willcox, Ariz	210.35	
Total		$656.54
Northern division:		
Bismarck, N. Dak	70.14	
Fort Yates, N. Dak	83.78	
Fort Custer, Mont	96.53	
Custer Station, Mont	90.55	
Fort McKinney, Wyo	76.10	
Clearmont, Wyo	6.73	
Eort DuChesne, Utah	83.42	
Taylor's Ranch, Utah	5.18	
Price, Utah	59.05	
Fort Reno, Okla	41.11	
Fort Sill, Okla	20.86	

Northern division—Continued.		
Rush Springs, Ind. T	$5.30	
Fort Brown, Tex	333.09	
Fort Ringgold, Tex	270.86	
Santa Maria, Tex	15.25	
Edinburg, Tex	60.20	
Total		$1,308.15
Total cash receipts		1,964.69

This amount was covered into the United States Treasury in accordance with law. During the same period $4,262.73 were collected for tolls on account of the commercial lines and turned over to the proper officials of those companies.

Only a small portion of the business transacted over the Government lines comes under the head of commercial business for which a tariff is charged, the main object of the maintenance of the lines being for the speedy and certain transaction of Government business; therefore, to show the importance of these lines in a military sense, the following table is submitted, which shows the aggregate number of messages handled to be 64,948:

Stations.	Value of free messages sent.	Commercial messages sent.	Commercial messages received.	Free messages sent.	Free messages received.	Total messages handled.
Carthage, N. Mex	$49.46	531	504	221	605	1,861
Holbrook, Ariz	157.58	228	366	546	673	1,833
Fort Apache, Ariz	751.45	306	234	1,472	1,322	3,334
Fort Bowie, Ariz	182.64	151	139	537	570	1,397
Fort Grant	858.17	622	561	2,287	2,139	5,609
Fort Stanton, N. Mex	63.24	506	524	731	286	2,047
Fort Thomas, Ariz	46.50	102	91	150	178	521
San Carlos, Ariz	920.13	721	623	1,886	1,812	5,042
Willcox, Ariz	25.54	1,284	1,393	2,437	2,730	7,844
Bismarck, N. Dak	86.78	697	1,046	439	697	2,879
Fort Yates, N. Dak	75.02	1,102	711	361	319	2,493
Fort Custer, Mont	91.02	915	640	1,135	840	3,530
Custer Station, Mont		640	915	840	1,135	3,530
Fort McKinney, Wyo	16.75	152	85	36	38	311
Clearmont, Wyo	5.02	102	102	38	39	281
Fort Du Chesne, Utah	74.40	687	453	123	135	1,398
Taylor's Ranch, Utah		48	40			88
Price, Utah	74.40	710	765	135	123	1,733
Fort Brown, Tex	207.07	2,298	2,588	2,487	2,397	9,770
Fort Ringgold, Tex	200.40	2,460	2,392	2,289	2,342	9,483
Total	3,885.67	14,282	14,172	18,150	18,380	64,984

Table showing the number of days and hours during which the United States military telegraph lines were interrupted during the year ending June 30, 1893.

Circuit or section.	Days.	Hours.
Holbrook to Fort Apache	18	7
Fort Apache to San Carlos	16	2
San Carlos to Fort Grant	16	2
Fort Grant to Willcox		
Willcox to Fort Bowie	1	9
Carthage to Fort Stanton	14	17
Bismarck to Fort Yates	10	7
Fort Custer to Custer Station	14	15
Fort McKinney to Clearmont		5
Fort Du Chesne to Price	8	7
Fort [illegible]eno to El Reno	4	
Fort Sill to Rush Springs	14	
Fort Brown to Fort Ringgold	12	8

CABLE AND LAND SYSTEM OF SAN FRANCISCO HARBOR.

The lines and cables connecting the fortifications of San Francisco with department headquarters and the commercial systems of the country are under the supervision of the acting chief signal officer of the Department of California, First Lieut. Chas. H. Bonesteel, Twenty-first U. S. Infantry, acting in that capacity during the year.

EXTRACTS FROM ANNUAL REPORT OF LIEUT. BONESTEEL.

The lines and cables remained in good condition until November 9, 18, and 29, when trouble was experienced on the San Francisco section, and until November 28 on the Alcatraz-Tiburon section, when, owing to a severe storm, poles were blown down and the end of the Alcatraz-Angel Island cable, which lands at Point Blunt, Angel Island, was washed out. Immediate steps were taken to repair the lines and secure the end of the cable. The cable was secured December 17 and found to be sound, but was again washed out before communication could be restored and could not be recovered before February 20, 1893, when, upon being tested, it was found to be unserviceable. It was again tested on February 23 as a final test with the same result.

A portion of the San Francisco section was rebuilt and general repairs made between December 28, 1892, and January 10, 1893, fifteen new poles were put in and the route of a portion of the line changed from across lots to along the line of accepted streets, after which no trouble occurred.

The condemned single-conductor cable, which formerly connected Fort Mason and Alcatraz Island, was sold at public auction on November 22, 1892.

On April 17 a main-line battery was set up at Tiburon in place of the battery formerly furnished by the Western Union Telegraph Company.

Owing to the limited appropriation available and the estimated expense of recovering and putting in working order the Angel Island-Alcatraz cable (about $600), it has been impracticable to maintain communication by telegraph between these points, greatly to the detriment of public business, and it is believed in the interest of economy that the entire cable system of San Francisco Harbor should be renewed with heavily armored cables.

Owing to the existence of border troubles on the Rio Grande the necessity for prompt and certain communication throughout this district became apparent, and the commanding general of the Department of Texas telegraphed the Chief Signal Officer, under date of December 30, 1892, urging the importance of extending the military telegraph line connecting Forts Brown and Ringgold to Fort McIntosh, a distance of about 110 miles. Acting upon this request, recommendation was made to the Major-General Commanding the Army that Congress be asked to appropriate $17,000 to build and maintain a permanent line connecting Forts McIntosh and Ringgold. As the construction of a permanent line, even after an appropriation was secured, would occupy considerable time, and believing the urgency of the situation required prompt action, the Chief Signal Officer telegraphed Gen. Wheaton, commanding the Department of Texas, that he would furnish at once three sections of flying field telegraph line of 20 miles each. Gen. Wheaton replied that he considered the building of such a line important and desirable, and the necessary material was therefore assembled as rapidly as possible at Fort McIntosh, the supplies being drawn from Forts Riley and Leavenworth, Kans., Fort Grant, Ariz., and New York City, and in six days from the date of the telegram Lieut. Joseph E. Maxfield, Signal Corps, left Fort Riley with twelve sergeants of the Signal Corps, charged with the construction of the flying telegraph line, reporting while en route for Fort McIntosh to the commanding general, Department of Texas, for consultation and instructions. Lieut. Maxfield, having secured the necessary details from troops in the department, began the work of erecting the line on January 14, 1893. This work was continued without delay (excepting in one or two instances while awaiting the arrival of material) and was completed on April 3, 1893, the line connecting Fort McIntosh and Lopena, Texas, a distance of 74 miles; four offices were established and operated by sergeants of the signal corps.

Gen. Wheaton complimented Lieut. Maxfield highly for the energy, efficiency, and skill displayed in the construction of this line.

Lieut. Maxfield's full report on the construction of the line forms part of this report and is marked Appendix "A."

On February 27, 1893, the bill appropriating $17,000 for the construction of the permanent line was approved, and the necessary arrangements at once entered into for the purchase of material and bids invited for the construction by civilian labor, the work of construction to be under the supervision of an officer of the Signal Corps, and, on July 1, when the appropriation became available, all details had been perfected for the commencement of the work upon the arrival of the material. At that date the flying field telegraph line was still doing good service.

Very respectfully,

C. E. KILBOURNE,
Captain, Signal Corps, Telegraph Officer.

The CHIEF SIGNAL OFFICER OF THE ARMY,
Washington, D. C.

APPENDIX "A."

FORT RILEY, KANS., *July 16, 1893.*

SIR: I have the honor to make the following report of the construction of a temporary telegraph line from Fort McIntosh, Tex., to Lopeno Ranch, Tex.:

In accordance with the provisions of Special Orders No. 2, Adjutant-General's Office, dated January 4, 1893, and letter of instruction from the Chief Signal Officer, I proceeded to San Antonio, Tex., reporting to the commanding general of that department, and thence to Fort McIntosh, arriving at that point on January 13. Here I found the signal detachment from Fort Riley, which had left that post January 10. Sergt. Pollner reported in a few days, making the strength of the detachment twelve men.

Upon the arrival on January 14 of the telegraph material shipped from Fort Riley, the work of construction was begun, the line being carried through the reservation and the town of Laredo and a terminal office established. On January 26, sufficient material having arrived, the real work of construction began. In this I had the assistance of a detachment from Company B of the Eighteenth Infantry, at first under the command of Lieut. Beall, Eighteenth Infantry, and afterwards of Capt. Paul, of the same regiment. The daily working force varied somewhat, but was usually about thirty men, of whom, at first, nine were sergeants of the Signal Corps. In constructing the line the arrangements of the working party was in general that laid down in Myer's Manual of Signals, though the relative size of the different subparties varied somewhat from that arrangement.

The thirty men were usually divided as follows: 1 director, 1 surveyor, 3 markers, 2 pin men, 8 bar men under charge of a noncommissioned officer, 2 wire men, 9 lance men, 2 men in lance truck, 1 axman. Toward the close of the work the size of the party was diminished by the loss of the operators left at the several camps.

The poles used were the light wooden lances of the field telegraph train, supplemented by 400 bamboo poles. The wire was No. 14 galvanized iron wire, and the insulators, except on the bamboo poles, were of hard rubber, such as are generally used with the wooden lances.

On account of the dense brush, which covered the entire country, and the winding roads the work of construction was very difficult. The surveyor could seldom march in a straight line on account of the brush, and often lost sight of the markers who indicated the direction he should take. To obviate this difficulty as far as possible three markers were employed, each equipped with a lance 17 feet long, carrying a small signal flag. Of course the use of a chain or wire to measure accurately the distance between lances was impossible in the thick brush. The lance party engaged in fitting the wire in the insulators and raising the poles, however, experienced the most trouble from the wire becoming caught in the brush. This difficulty was partly overcome by equipping two of the lance men with poles fitted with hooks, by which the wire was raised and held aloft. Oftentimes, however, when the brush was high no resource was left but to cut out a pathway through it and deliver the wire from a handreel.

On account of these difficulties, the progress was more slow than would ordinarily be the case in the erection of a light line. It was also felt that, as the line was to be maintained for some time, the first care should be to make it as strong as possible, even at the sacrifice of speed.

About 5 miles were erected in a working day. This day was short, as, on account of the scarcity of water, suitable camps were few, and much time was necessarily lost in marching to and from camp. Delays also arose from stormy weather, and waiting, from time to time, for material.

On February 6 the camp at San Ygnacio was reached and an office established at that point. On the 11th the line was completed nearly to Carrizo, and telegraphic communication given to the troops there stationed. It was not until the end of March that the necessary material for the completion of the line to Lopeno reached me. This work was done on April 1, 2, and 3, and the terminal office established.

Upon the completion of the line, the detachment of infantry proceeded to Fort McIntosh, and the line was maintained and operated by the sergeants of the Signal Corps with occasional assistance given in the case of serious breaks by the commanding officers at the several camps. Two sergeants were stationed at each of the four offices to act as operators and repairmen.

In addition to the ordinary repair trips, made when faults occurred, the entire line was patrolled once each week. The line thus constructed is still in operation, and was, when I left it in June, in excellent condition. Though built of the lightest material, it has afforded reliable communication with the troops in the field along the Rio Grande River for several months. Breaks were frequent, but ordinarily were quickly repaired. The longest time during which no fault occurred was ten days.

The faults occurring were seldom due to storms or high winds, but usually to

malicious interference with the line or to breaks made by the cattle herds. From these causes many poles were broken.

That lances and insulators devised for field lines, which would ordinarily be kept standing but a few days at a time and then under continued patrol, should stand this severe test, shows the general excellence of the material used in the equipment of the flying telegraph train. The bamboo poles used proved to be almost perfect poles for a semipermanent line as this was, but on account of their great bulk are unsuited for use with the field telegraph train proper. They are very strong for their weight and few faults occurred on those portions of the line built with them. The wooden lances can hardly be improved upon for use with the flying telegraph train, being light and strong and of such small diameter that their transportation is easy. It is believed, however, that the shorter lances, 14 feet in length, would be more serviceable if a foot longer; this certainly would be the case when suspension insulators were used.

The No. 14 iron wire was found to be strong and, on the whole, easily handled. In the case of a few coils trouble from kinking was experienced. Greater flexibility is desirable. This is given by hard drawn copper wire of which two miles were strung. It was found, however, to be deficient in strength. Copper wire of slightly larger diameter would, I think, be an improvement on either.

Of the rubber insulators two patterns were used, viz, upright insulators, some fitted with slots and some with clamps, and suspension insulators. The first being screwed into the top of the poles increased the height of the wire above the ground, while the suspension insulators, being hung from the side of the poles, held the wire nearly a foot lower. It was also found that the suspension insulators did not allow the wire to pass through them readily when being pulled up. This was a serious defect in the present instance, as, on account of the brush, the wire could not be reeled off without a great deal of slack. The swinging motion allowed by the suspension insulators in high winds also caused breaks at the poles fitted with clamp insulators due to an apparent cutting or wearing of the wire. The upright insulators could be improved by slightly changing the form of the slot so as to prevent a slipping of the wire, and in the case of the clamp insulators by shortening the rod bearing the clamp so as to give it greater strength.

The wagons (old pattern) of the field telegraph train which were used proved, though old, to be strong and well adapted to the work for which they were designed. The lack of play of the tongues in a perpendicular plane, however, resulted in the breaking of several tongues. The reel of the wire wagon was too small for the wire as received from the manufacturers, while the break attachment to the reel was continually in the way without serving any good purpose. In a wooded or broken country the reel should be one which could be easily dismounted and used as a hand reel.

The weight of the field battery used (square Eagle cells) seemed excessive. As the cells are large, and the only advantage of size is to lessen the battery resistance, which, on a line of any length, is only a part of the total resistance, it would seem to be possible to secure nearly the same current from smaller cells.

I am indebted to the officers commanding the detail of infantry and the commanding officers of the several camps through which the line passed for valuable aid in the prosecution of the work.

Very respectfully, your obedient servant,

J. E. MAXFIELD,
First Lieutenant, Signal Corps.

The CHIEF SIGNAL OFFICER, U. S. ARMY,
Washington, D. C.

APPENDIX B.

REPORT OF THE DIVISION OF MILITARY SIGNALING.

WAR DEPARTMENT, SIGNAL OFFICE,
Washington, D. C., September 1, 1893.

SIR: I have the honor to submit the following report of the operation of the division of military signaling during the year ended June 30, 1893:

This division has been, as heretofore, engaged in the examination, collation, and tabulation of reports of instruction and practice in military signaling in the Army. All requisitions for signal or telegraph instruments and stores, forms, stationery, etc., are scrutinized and approved, sealed or disapproved, as circumstances warrant. Upon the completion of action each requisition is filed in this division, where reference thereto may be readily had. Correspondence with the National Guards and civilians relative to military signaling in its various branches also devolves upon this division.

Before acceptance all instruments and supplies purchased are inspected, and when necessary specifications for the same are prepared.

Foreign and domestic periodicals and publications are gone over and notes or extracts of military signaling subjects made for the card index of subjects of this division.

The following table shows the number of hours devoted in each department to signal instruction and practice. It is made up by taking the sum of the hours spent in preliminary, flag, heliograph, torch, and lantern practice by each officer and enlisted man under instruction. Dividing the total number of hours by the average number of officers and men eligible for instruction in the department gives the relative amount of practice in proportion to the number of men. As will be seen the time given to instruction varies from a half hour in the Department of the Columbia to five and two-tenths hours in the Department of California. The differences in the averages is partly attributable to the fact that at some posts nearly all men were instructed; in one case 43 men of a battery were instructed together. While this makes towards increasing the average number of hours of instruction and practice in that department, it does not necessarily follow that more skilled signalists are developed or that the number of men actually under instruction devote more, or even as many, hours to study and practice as in other departments where the average is less:

Department.	Preliminary.	Day.	Night.	Total.	Average number of hours per man.
	Hours.	*Hours.*	*Hours.*	*Hours.*	
California	269	5,256	607	6,132	5.2
Columbia	39	675	.....	714	.5
Colorado	1,456	5,509	164	7,129	3
Dakota	324	2,239	283	2,846	.9
East	5,496	5,502	504	11,412	2.4
Missouri	1,278	3,344	284	4,906	1.5
Platte	1,473	4,327	43	5,843	2.4
Texas	1,199	1,027	211	2,437	1.3

This gives an average of about two hours per man for the enire Army for the year, as against three and four-tenths hours last year. This decrease is due largely to the fact that at many posts heretofore instruction was held each month in the year, whereas it is now restricted to two months in each year at nearly every post in the Army. Better results can be looked for under this new order, as interest is held and stimulated during the shorter period.

During the year 625 reports of instruction and practice in military signaling were received and examined.

Number of officers and enlisted men at each post who are reported proficient in signaling as required by paragraph 1761, Army Regulations:

Post.	Officers.	Enlisted men.	Post.	Officers.	Enlisted men.
Adams, Fort	4	15	Niagara, Fort	3	9
Alcatraz Island	4	10	Niobrara, Fort	8	28
Angel Island	7	21	Omaha, Fort	7	27
Apache, Fort	2	.....	Ontario, Fort	2	6
Assinnaboine, Fort	.....	30	Pembina, Fort	1	4
Barrancas, Fort	2	8	Pilot Butte Camp	1	4
Bayard, Fort	4	22	Plattsburg Barracks	1	6
Benicia, Barracks	3	24	Porter, Fort	2	9
Bidwell, Fort	1	1	Preble, Fort	1	5
Bliss, Fort	5	8	Presidio of San Francisco	.....	129
Boise, Barracks	2	4	Reno, Fort	.....	.....
Bowie, Fort	3	11	Riley, Fort	.....	11
Brady, Fort	3	13	Ringgold, Fort	1	4
Brown, Fort	.....	.....	Robinson, Fort	9	36
Buford, Fort	4	8	St. Francis Barracks	3	10
Canby, Fort	2	8	Sam Houston, Fort	9	35
Clark, Fort	.....	.....	San Carlos	5	16
Columbus, Fort	3	12	San Diego Barracks	.....	3
Custer, Fort	11	17	Schuyler, Fort	3	18
D. A. Russel, Fort	8	32	Sheridan, Fort	.....	.....
Douglas, Fort	3	31	Sherman, Fort	4	15
Duchesne, Fort	1	9	Sidney, Fort	5	13
Eagle Pass	1	5	Sill, Fort	3	10
Grant, Fort	1	6	Snelling, Fort	.....	.....
Hamilton, Fort	9	25	Spokane, Fort	5	1
Hancock, Fort	1	6	Stanton, Fort	4	7
Huachuca, Fort	1	16	Sully, Fort	2	12
Jackson Barracks	2	8	Supply, Fort	2	13
Keogh, Fort	7	20	Thomas, Fort	7	7
Key West Barracks	1	5	Townsend, Fort	.....	.....
Leavenworth, Fort	8	28	Trumbull, Fort	2	5
Logan, Fort	1	29	Vancouver Barracks	7	29
Mackinac, Fort	1	10	Wadsworth, Fort	4	25
Madison Barracks	8	24	Wallawalla, Fort	.....	.....
Marcy, Fort	2	8	Warren, Fort	2	8
Mason, Fort	3	6	Washakie, Fort	2	13
McHenry, Fort	2	31	Washington Barracks	6	37
McIntosh, Fort	.....	.....	Wayne, Fort	4	28
McKinney, Fort	10	22	Whipple Barracks	3	16
McPherson, Fort	4	21	Wingate, Fort	7	14
Meade, Fort	12	84	Wood, Fort	.....	9
Missoula, Fort	3	10	Yates, Fort	5	23
Monroe, Fort	.....	28	Yellowstone, Fort	3	4
Mount Vernon Barracks	1	20			
Myer, Fort	4	17	Total	288	1,388
Newport Barracks	1	16			

Number of officers and enlisted men at each post reported competent to send and receive fifteen words per minute by electric telegraph, Morse code.

Post.	Officers.	Enlisted men.	Post.	Officers.	Enlisted men.
Adams, Fort	.....	.....	Grant, Fort	1	2
Alcatraz Island	.....	4	Hamilton, Fort	1	2
Angel Island	1	2	Hancock, Fort	.....	.....
Apache, Fort	.....	1	Huachuca, Fort	1	6
Assiniboine, Fort	.....	7	Jackson Barracks	.....	.....
Barrancas, Fort	1	.....	Keogh, Fort	.....	4
Bayard, Fort	.....	2	Key West Barracks	.....	2
Benicia Barracks	2	1	Leavenworth, Fort	8	7
Bidwell, Fort	1	1	Logan, Fort	.....	1
Bliss, Fort	2	1	Mackinac, Fort	.....	2
Boise Barracks	.....	2	Madison Barracks	4	7
Bowie, Fort	.....	4	Marcy, Fort	1	1
Brady, Fort	2	.....	Mason, Fort	.....	2
Brown, Fort	.....	.....	McHenry, Fort	.....	1
Buford, Fort	.....	3	McIntosh, Fort	.....	.....
Canby, Fort	1	.....	McKinney, Fort	1	1
Clark, Fort	2	1	McPherson, Fort	2	3
Columbus, Fort	.....	1	Meade, Fort	4	7
Custer, Fort	.....	.....	Missoula, Fort	.....	2
D. A. Russell, Fort	.....	2	Monroe, Fort	8	20
Douglas, Fort	3	.....	Mount Vernon Barracks	.....	3
Du Chesne, Fort	.....	2	Myer, Fort	.....	.....
Eagle Pass	.....	.....	Newport Barracks	.....	1

Number of officers and enlisted men at each post reported competent to send and receive fifteen words per minute by electric telegraph, Morse code—Continued.

Post.	Officers.	Enlisted men.	Post.	Officers.	Enlisted men.
Niagara, Fort	2	4	Snelling, Fort	1	.....
Niobrara, Fort	3	1	Spokane, Fort	.....	1
Omaha, Fort	1	6	Stanton, Fort	2	4
Ontario, Fort	.....	.....	Sully, Fort	.....	5
Pembina, Fort	1	2	Supply, Fort	.....	.....
Pilot Butte camp	.....	.....	Thomas, Fort	3	4
Plattsburg Barracks	.....	.....	Townsend, Fort	.....	1
Porter, Fort	1	4	Trumbull, Fort	2	2
Preble, Fort	1	1	Vancouver Barracks	2	10
Presidio of San Francisco	.....	3	Wadsworth, Fort	.....	3
Reno, Fort	.....	.....	Walla Walla, Fort	.....	.....
Riley, Fort	.....	.....	Warren, Fort	.....	2
Ringgold, Fort	.....	.....	Washakie, Fort	.....	2
Robinson, Fort	1	.....	Washington Barracks	.....	8
St. Francis Barracks	2	2	Wayne, Fort	1	2
Sam Houston, Fort	3	7	Whipple Barracks	2	1
San Carlos	1	7	Wingate, Fort	1	.....
San Diego Barracks	.....	1	Wood, Fort	.....	.....
Schuyler, Fort	1	.....	Yates, Fort	.....	7
Sheridan, Fort	.....	2	Yellowstone, Fort	2	.....
Sherman, Fort	.....	.....			
Sidney, Fort	.....	1	Total	79	202
Sill, Fort	.....	1			

Lieut. Frank Greene, Signal Corps, chief signal officer, Department of Arizona, makes the following report of heliograph practice in that department:

"Concerted heliograph practice between detachments from the post in the southern part of the department, directed in General Orders No. 1, current series, these headquarters, was held from February 6 to 16, 1893, by detachments from Forts Grant, Huachuca, Bowie, and Bayard, occupying stations on the Graham Mountains, Table Mountain, Colorado Peak, Fort Huachuca, Fourrs ranche, Bowie Peak, Arizona, and at Steins Pass, Camp Henely and Fort Bayard, N. Mex.

"The air-line distances by heliograph flash covered were as follows, viz:

	Miles.
Graham Mountains to Table Mountain	34
Graham Mountains to Bowie Peak	48
Table Mountain to Colorado Peak	45
Fort Huachuca to Colorado Peak	40
Fort Huachuca to Fourrs ranch	37
Bowie Peak to Fourrs ranch	39
Bowie Peak to Steins Pass	26
Bowie Peak to Camp Henely	66
Camp Henely to Fort Bayard	31
Camp Henely to Steins Pass	40
Aggregating a flash distance, covered during the practice, of	406

"In addition, the officers at Mount Graham and Fort Huachuca made many persevering attempts to open direct communication over the 85-mile line between those two points, but the dim sunlight, due to the winter season, with the sun far south, rendered the attempts futile.

"The greater ranges of 66 and 48 miles were worked with the station heliograph; still, the range of 45 miles from Colorado Peak to Table Mountain was successfully worked from Table Mountain with the field heliograph; it is to be remarked, however, that in this instance the Table Mountain station from its position, nearly due north from Colorado Peak, was able always to work with the direct rays of the sun; the station heliograph was used at Colorado Peak.

"The flash from the station heliograph at Camp Henely was easily read with the naked eye at Bowie Peak, the two points being 66 miles apart.

"In the majority of instances the stakes and guide lines at the stations showing the direction of communicating stations, which were left by the last signal detachments on May 15, 1890, were found in good condition; notably was this the case at Table Mountain, where they are reported as having been found in almost perfect condition, in one instance none were found but in all cases the stakes and guide lines were reëstablished and left in as permanent condition for the next party as was practicable.

"The principal object of the plan being to familiarize officers and men who are likely to be called upon for signal duty with the location of the principal stations and the appearance therefrom of connecting stations, it is gratifying to see the success with which this long line of stations, covering as it does that part of the southern border over which lie the principal Indian trails to and from Mexico, was simultaneously occupied and communication promptly opened from station to station by officers and men acting as signal detachments, many of whom then saw the stations for the first time, and most of whom have arrived in this department since the date of last heliograph practice, that of 1890. All detachments were provided with blueprint maps of the heliograph system of this department on which the direction and bearing of connecting stations are clearly shown; these, with the carefully erected stakes left by the parties last occupying the points, rendered the opening of communication an easy matter. The month of February is not the most favorable for heliograph practice in this section, but on account of the troops in the department having been closely occupied with the new drill regulations up to December and near the approach of the target season which naturally takes up the most favorable months of the year, no other time was available. The weather during parts of the practice was most unfavorable, and the fact that so much was done under unfavorable circumstances speaks well for the skill, tact, and patience of every officer and man engaged in it. While it is not well to do that inconveniently that can be done just as well conveniently, those who have just signaled under sometimes trying circumstances, will find its benefit in the ease with which this will enable them to perform the same duty in pleasant weather.

"The following is the composition of the detachments at the several points, viz:

"Superintendent of heliograph practice with authority to visit any point on the line, Capt. F. K. Ward, First Cavalry.

"*Graham Mountain:* Second Lieut. J. W. Furlong, First Cavalry, with 2 sergeants, 1 corporal, and 1 private of the First Cavalry as operators.

"*Table Mountain:* Second Lieut. J. D. L. Hartman, First Cavalry, with 1 sergeant, 1 corporal and 2 privates of the First Cavalry as operators.

"*Colorado Peak:* Second Lieut. J. J. Hornbrook, Second Cavalry, with 2 sergeants, 2 corporals, and 2 privates of the Second Cavalry as operators.

"*Fort Huachuca:* Second Lieut. J. D. Leitch, Twenty-fourth Infantry, with 1 corporal and 4 privates of the Twenty-fourth Infantry as operators.

"*Fourr's Ranch:* Second Lieut. S. V. Ham, Twenty-fourth Infantry, with 1 corporal and 5 privates of the Twenty-fourth Infantry as operators.

"*Bowie Peak:* Second Lieut. J. S. Winn, Second Cavalry, with 1 corporal and 3 privates of the Second Cavalry as operators.

"Stein's Pass: First Lieut. R. B. Byran, Second Cavalry, with one sergeant and three privates of the Second Cavalry as operators.

"Camp Henely: Second Lieut. I. C. Jenks, Twenty-fourth Infantry, with two sergeants and five privates of the Twenty-fourth Infantry as operators.

"Fort Bayard: Second Lieut. H. C. Keene, jr., Twenty-fourth Infantry, with one corporal and three privates of the Twenty-fourth Infantry as operators.

"All of whom are deserving of credit for the energy with which they conducted their several duties.

"The aggregate number of all messages exchanged at the different stations was 348.

"In connection with heliograph operations in the southern part of this department it is interesting and valuable to note very briefly the weather conditions that prevail, as taken from meteorological publications, covering a period of eighteen years. Taking Fort Grant as a central point on a probable line, it is found that the least average cloudiness has prevailed in the month of October, 17 per cent; May, 21 per cent; April, 22 per cent, and the greatest average in July is 48 per cent, and August, 44 per cent. The least average probability of rainy days in April and May, 8 per cent; October and November, 11 per cent, and the greatest average in July, 45 per cent, and August, 41 per cent. The least average wind occurs in July and August, when the clouds and rainfall are the greatest."

TELEPHONES.

Of the 93 posts reported garrisoned on June 30, 1893, 52 are equipped with telephonic instruments. At the request of the inspector of small arms practice, Department of the Columbia, which request was approved by the department commander, the telephones at posts within his department having target ranges were replaced by electric call bells. The result of the experiment is not yet known, no reports from the interested posts having been received. The acting signal officer at Fort Canby, Wash., requested authority to retain at his post the telephones and transmitters for which he was responsible on the plea that they were necessary for use on the artillery ranges. His request was granted. The following-named posts in the Department of the Columbia are supplied with the call-bell outfit, viz, Boise Barracks, Fort Sherman, Spokane, Townsend, Walla Walla, and Vancouver Barracks.

Twenty-four long-distance transmitters were procured on life rental from the American Bell Telephone Company, which brings the number of these instruments now held by this corps on life lease up to 55. The number of Blake transmitters on annual and on life lease, 55 and 20, respectively, remained unchanged during the year. Eight of the latest style hand telephones were procured on annual rental, which brings the number of this pattern on which annual rental charges are paid up to 35. Four of the Eccard style telephones on annual rental were returned to the lessors.

The following tabulation shows the kind and number of telephonic instruments on annual and life rental, in use and on hand, at the close of the year:

Telephones.	Annual rental.	Life rental.	Total.
Eccard	11	.....	11
Hand	35	23	58
Pony Crown (style No. 22)	.....	22	22
	46	45	91
Transmitters:			
Blake	55	20	75
Long-distance	.....	59	59
	55	79	134

Total number of telephones and transmitters on annual and life rental, 225.

The distribution of telephonic instruments, by military departments, is shown by the following tabulation:

Department.	Telephones.		Transmitters.	
	Hand.	Crown and service.	Blake.	Long-distance.
California	5	10	.....	5
Colorado	20	8	20	3
Columbia	3	.....	3	.....
Dakota	3	16	10	5
East	10	26	25	13
Missouri	13	14	2	16
Platte	2	21	6	6
Texas	2	15	8	5

In stock at signal office, Washington, for emergency issue: 17 service telephones; 1 Blake transmitter, annual rental; 6 long-distance transmitters.

At twenty-two institutions of learning, where officers of the U. S. Army are detailed as professors of military science and tactics, flags, and in a few cases field glasses and torches, have been issued on requisition. Much interest is taken by many of the students and in many instances is brought with them after graduation into civil life. It has not been possible to supply more than a small part of the appliances asked for, as no issue at the expense of the regular Army, which absorbs nearly all, has been made. Upon issuing the 120 heliographs received from the contractor during the year there were called in, from various army posts, a number of heliographs of old style and of little value except for instruction and use over short ranges. Of these instruments, such as are serviceable or can be readily made so, it is intended to issue to those military college where the greatest interest has been manifested, and where opportunity and the topography of the country admit of comparatively long range practice.

The following are the colleges to which issues have been made: Ohio Normal University, Ada, Ohio; Mount Union College, Alliance, Ohio; Michigan Agricultural College, Lansing, Mich.; Virginia Agricultural and Mechanical College, Blacksburg, Va.; Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.; Pennsylvania Military College, Chester, Pa.; Agricultural and Mechanical College of Texas, College Station, Tex.; Ohio State University, Columbus, Ohio; North Georgia Agricultural College, Dahlonega, Ga.; St. John's College, Fordham, N. Y.; Knox College, Galesburg, Ill.; University of North Dakota, Grand Forks, N. Dak.; Grove City College, Grove City, Pa.; Purdue University, Lafayette, Ind.; Virginia Military Institute, Lexington, Va.; State Agricultural College, Manhattan, Kans.; West Virginia University, Morgantown, W. Va.; Cornell Col-

lege, Mount Vernon, Iowa; St. John's Military School, Manlius, N. Y.; Delaware College, Newark, Del.; Norwich University, Northfield, Vt.; Michigan Military Academy, Orchard Lake, Mich.

Continued interest is shown by the National Guards of the States in military signaling and many applications for publications treating on the subject have been received and, as far as possible, filled. Nowhere has greater or more intelligent interest been displayed than in the National Guard of Pennsylvania where, because practical demonstration of the usefulness, in fact the necessity, of a corps of expert signalists during active service has been had, this branch of scientific warfare is fully appreciated.

The law, while authorizing the issue of quartermaster's and ordnance stores and camp and garrison equipage, the actual cost of which is charged against the allotment of the State making requisition therefor, is silent as to signal appliances and stores. Attention has been and is again invited to this and recommendation made that it be rectified. It is to be regretted that the interest in signaling, which induces men in the National Guard to purchase at their own expense the primary appliances for visual communication, as has been done in many instances, is not fostered and developed.

OUTPOST CABLE CART.

The spooling device of the outpost cable cart referred to in the last annual report did not prove entirely satisfactory as it was necessary to remove the cable from the guide whenever it was to be unreeled, the spooling device not working under these conditions. A new and improved cart was constructed in which this difficulty was overcome. With the new device there is no necessity for removing the cable in reeling up or unreeling it as the device works equally well in either case. The spooling device consists, essentially, in a double endless screw in the grooves of which a guide works. This guide has a carrier with a pulley through which the cable passes. A description of the new cart, with detailed directions for its use, follows:

The cable cart consists of a frame of bicycle steel tubing 1 inch in diameter, mounted on 32-inch bicycle wheels with heavy cushion tires. The cart carries one knapsack and five reels of outpost cable, one of which is in the knapsack. The reels are suspended in brackets by the axle ends. One of each pair of brackets has a snap catch which holds the reel firmly in place. When the reel is to be taken from its brackets the snap catch is turned by its milled head until the axle end can be seen through the cut in the catch, when the reel can be lifted out. When a reel is placed in the brackets the milled head of the snap catch should be turned until the catch snaps into place. Each reel carries, approximately, one-third of a mile of double conductor cable. The ends of this cable are attached to double connectors by means of which they can be joined so as to extend the line. In each reel the double connector nearest the axle is connected by means of insulated wires, the inner conductor to one axle end of the reel and the outside conductor to the other axle end (the axle ends are insulated from each other). At the rear end of the cart is a reeling apparatus having an automatic spooling attachment. The reel to be unwound or wound up is placed in the brackets connected with the reeling device. The end of the axle of this reel which is connected with the interior conductor of the cable is placed in brackets on the left of the cart (the bracket which does not carry the gear wheels). The socket of this bracket is insulated from the rest of the bracket and, therefore, from the frame of the cart; on this bracket will be found a double connector, the insulated screw of which is connected by an insulated wire to the insulated socket, and, consequently, with the inner conductor of the cable; the outer part of the double connector is in connection with the frame of the cart, and through this with the bracket on the right of the cart, and therefore with the outer conductor of the cable. In reeling or unreeling the cable it should be allowed to pass over the pulley of the carrier.

If more than one reel is to be used the empty reel is exchanged for a full reel, the ends of the cables being connected by means of double connectors. In connection with the reel cart are used two telephone kits. The kit is a leather case carried by means of a shoulder strap, and contains the battery (a cell of dry battery of proper size), the induction coil, and the combined long-distance transmitter and receiver telephone, and a telegraph key and switch. When a line is to be established the free end of the cable is connected to the telephone kit at the home station and the cable run out. Two men should go with the cart, one of whom should be equipped with the telephone kit. When it is desired to establish communication with the home station the double connector on the telephone kit is connected with the double connector on the frame of the cart and the circuit is then complete and communication may be had. The connection between the telephone kit and the cart may be kept up while reeling out the cable and communication with the home station made continuous, so that orders to the men with the cart can be sent at all times and they can make report at any moment to the officer in charge of the home station.

To open communication call by means of the telegraph key, and when the call has been answered place the telephone, held in the left hand, to the ear. This will bring the transmitter into proper position. Press down firmly with the right hand the small switch key which is placed in the kit perpendicular to the telegraph key; this throws the transmitter into circuit. This switch key must be held down firmly as long as conversation is required, as the moment the switch key is released the transmitter is thrown out of circuit and conversation is impossible.

In unreeling the cable the brake on the left of the bracket connected with the spooling device should be applied. This will prevent the unwinding of the cable when the cart is stopped. In reeling up the cable the brake should be taken off, which is done by drawing back the brake by means of its milled head and turning this brake one-half turn to the right or left. In reeling up the cable a slight but uniform tension should be maintained by permitting the cable to slide through the hand. Unless strict attention is paid to this direction the cable will not wind evenly upon the spools.

Should it be necessary to move the carrier which is attached to the double screw and through the pulley of which the cable should pass in unreeling or reeling up the cable press down on the end of the lever, which will free the guide from the grooves of the screw, and move the carrier to the right or left to the desired position, then release the lever and the guide will be engaged in the groove. If the carrier should not move in the desired direction when the crank is turned press down the lever and engage the guide in the proper groove of the double screw.

If it is desired to extend the line by means of the knapsack engage the double connector of the coil of the knapsack in the double connector of the frame of the cart. This connects the knapsack coil with the line. When communication with the home station is to be established engage the double connector of the telephone kit in the double connector on the frame of the knapsack and the telephones at the two stations are in circuit.

The cart without the reels weighs 55 pounds and when equipped with the five reels and knapsack weighs 159 pounds. The legs of the cart are secured when down or up by means of thumbscrews on frame of cart. When necessary three additional coils of cable can be placed upon the coils supported in the brackets and the whole bound firmly together by a strap. The total weight of eight reels, cart, and knapsack is 161 pounds. Shafts and a skeleton harness are provided so that when necessary or expedient the cart can be harnessed to a saddled horse.

This outpost cable cart forms part of the Signal Corps exhibit at the World's Columbian Exposition. At the opening ceremonies at the Exposition use was made of the outpost cable, and it was found not to have sufficient tensile strength for rough service as several of the coils were broken. In order to overcome this difficulty the Bishop Gutta-Percha Company of New York was requested to construct a sample cable in which the copper return wires should be replaced with ductile steel wires so as to increase the tensile strength, the cable to be of the same diameter as that originally furnished for use with the outpost cable cart. This sample cable has been made, but, owing to error on the part of the foreman having charge of the work, the diameter is 0.014 inch greater than called for. The cable will be sent to Capt. R. E. Thompson, Signal Corps, in charge of the signal exhibit at Chicago for test with the cart. If it does not work satisfactorily the company will replace it with one of proper size.

The inner conductor of this cable consists of one steel wire surrounded by seven copper wires. The steel wire is No. 29—American or Brown and Sharp gauge—having a diameter of 0.0112 inch. The copper wires are No. 33, diameter 0.0071 inch. The inside conductor is wound with a very fine cotton, then insulated with balata compound to a diameter of 0.069 inch. The balata is covered with cotton which acts as a cushion for the tinned-steel wires of the outside conductor. The outside conductor, which consists of 20 No. 30 tinned-steel wires, diameter 0.01 inch, is formed by winding the wires around the insulated core with a long lay. This gives additional strength to the cable. The outside conductor is covered first with a cotton braid, diameter 0.123 inch, then with a strong linen-thread braid, which forms the outside covering and is 0.152 inch in diameter.

The insulation resistance per 1,000 feet is 782 megohms at 70° F. The resistance of the inside conductor is 25.29 ohms per 1,000 feet, and the resistance of the outside conductor is 48.80 ohms per 1,000 feet.

Tabular description of United States outpost cable.

	Inch.
Diameter of inside steel wire	0.012
Diameter of inside copper wire	.0071
Diameter outside of inside conductor	.026
Diameter outside of first cotton	.030
Diameter outside of balata composition	.069

	Inch.
Diameter outside of second cotton	0.075
Diameter outside of second conductor	.093
Diameter outside of cotton braid	.123
Diameter outside of linen thread	.152

The breaking strain of the sample cable is 450 pounds, and of the cable with copper return wires 125 pounds.

INSTRUCTION AND PRACTICE IN MILITARY SIGNALING AT FORT RILEY, KANS.

First. Lieut. J. E. Maxfield, Signal Corps, has continued in charge of the schoo for enlisted men of the Signal Corps at Fort Riley, Kans. There has been no change in the course of instruction, which is divided into two parts, theoretical and practical, the former occupying four months and the latter two months. The course embraces electricity and telegraphy; the use, construction, and repair of telephones; military signaling and field surveying, including map-making, and is designed to make each enlisted man an expert signalist and a good telegraph operator, and to enable him to make rough field sketches of country about which information is desired. Lieut. Maxfield has devoted himself to his duties and has made the course of instruction an admirable one.

On October 16, 1892, the signal detachment left Fort Riley for Chicago for du in connection with the dedicatory ceremonies of the World's Columbian Exposition. After satisfactorily performing the duties required it returned to Fort Riley on the 25th of the same month.

Early in January, 1893, Lieut. Maxfield proceeded with the signal detachment and a flying telegraph train to Texas to construct a telegraph line in the Rio Grande Valley for the use of troops engaged in suppressing the Garza trouble. The line extends from Fort McIntosh to Lopena, a distance of 75 miles, and is still in operation.

Gen. Wheaton, commanding the Department of Texas, highly complimented Lieut. Maxfield for the energy and good judgment shown by him in the construction of the flying line. A detailed report of its construction will be found in the report of the telegraph officer. Lieut. Maxfield, with four sergeants, returned to Fort Riley on June 5, leaving five men for duty with the line as operators and repair men.

Eighteen sergeants of the Signal Corps were under instruction during the year. Of these, eight completed the course and were assigned to duty elsewhere, one was discharged, and nine are still undergoing instruction.

During the months of August and November, 1892, Lieut. Maxfield instructed thirty-eight enlisted men of the line belonging to the garrison of Fort Riley, each man having forty-one hours of actual practice with the flag, torch, or heliograph. Of these men fourteen were pronounced proficient, while practically the whole detail could signal with the flag at ordinary ranges.

The course of instruction for the line officers at the post was interfered with by the absence of Lieut. Maxfield in Texas.

SIGNAL LANTERN.

Experiments with a view to obtain a satisfactory lantern for midranges have been continued. Three English signal lanterns were obtained through the courtesy of Maj. J. C. Post, U. S. Engineers, Military Attaché at London, and were sent to Lieut. Maxfield, Signal Corps, at Fort Riley, Kans., for trial. Two of these lanterns use slow-burning oil, the other being a candle lantern. Lieut. Maxfield reported, as a result of his tests, that the candle lantern was unsatisfactory. The other two lanterns could be read with the unaided eye at a distance of 10 miles—the longest range available—and Lieut. Maxfield is confident that they could be read at a distance of from 15 to 20 miles with the aid of a signal telescope. These tests proved that, in so far as power is considered, the lanterns were satisfactory, but both are fitted with devices for signaling which form part of the lantern. This is believed to be a defective principle for the following reasons: First, it increases the weight of the lantern; second, it makes the lantern complicated and adds to its cost; third, in manipulating the key the lantern is apt to be moved, and a very slight movement will change the direction of the beam of light so as to render it invisible at the distant station. The above considerations prevented the adoption of either of the lanterns.

A model lantern has been constructed for this corps which resembles one of the English lanterns in general appearance but is devoid of all signaling devices. This lantern promises to be satisfactory up to a distance of 18 to 20 miles, which is as far as signal stations will ordinarily be separated. The new model has no chimney; it is simply a lantern constructed for the purpose of throwing out a powerful beam of

light. For this purpose a reflector is placed behind the flame and the desired divergence is given to the rays of light by a plano-convex lens. The lantern is, therefore, a modification of the bull's-eye form.

In signaling with this lantern the method employed is the same as that of transmitting the sun flash of the heliograph, the lantern being attached to the heliograph tripod by means of a female screw, and is so adjusted by means of sights as to direct the beam of light upon the distant signal station. The heliograph screen, which is always a part of the equipment of a signal party, is then so placed as to cut off the entire light when closed and permit the free passage of the rays of light when open. The illuminating fluid is that used by bicyclists, a mixture of kerosene and sperm oil. The light given out is a brilliant one and the lamp has been burned for hours without becoming heated to such an extent as to make it uncomfortable to handle or to cause danger of explosion.

Another model now under construction may prove more satisfactory for long ranges than the one above referred to. It is provided with a double, oval wick with air spaces in the center and between the wicks. By means of a tall, iron telescopic chimney a strong draft is obtained; a reflector behind the flame insures a brilliant light, over 360 candle power according to the maker. With this lantern, as with the other one described, the signal apparatus is the heliograph screen.

HELIOGRAPHS.

In the last annual report reference was made to a new model heliograph constructed by the Ordnance Department on plans furnished by this office and that an award had been made to Mr. J. P. Friez, of Baltimore, Md., for the construction of thirteen. The heliographs were received from Mr. Friez in January and are very satisfactory, the workmanship being of a high order of excellence. They have been issued to the officers of the Signal Corps for experiments and test.

During the year 120 heliographs of the standard model were procured under contract. Mr. Friez was the successful bidder and the instruments are entirely satisfactory.

All unserviceable heliographs have been called in from military posts and replaced by new ones and at the close of the fiscal year every post garrisoned by four or more companies was equipped with four or more heliographs and all other garrisoned posts with at least two heliographs.

The new heliograph screens, model 1892, have proved to be entirely satisfactory, and 150 of them have been issued. The old screens having a single leaf have been fitted with the pull spring as rapidly as possible. The altered screens have given satisfaction and are quite serviceable. Nearly all of the old model screens have been altered.

TELESCOPES AND FIELD GLASSES.

Fifty-nine telescopes and cases and 38 field glasses and cases were thoroughly overhauled, cleaned, and repaired by an expert instrument-maker, and now are, considering their age and the service done, in very satisfactory condition. Nearly all of these are still available for issue.

Forty-seven field glasses in aluminum frames of the Lemaire, Paris, France, make were procured from domestic dealers. These and the Voigtlander & Son, Brunswiek, Germany, make were issued in pairs, one of each kind, to acting signal officers, who were asked to report as to their relative serviceability. It was practically unanimously reported that in all qualities and respects the Lemaire was equal to the other, which agrees with the finding of this office in preliminary tests. The Voigtlander and Lemaire glasses, complete, with case, strap, and sling, cost, delivered at this office, respectively, $39.18 and $27.

This corps now has 219 field glasses in aluminium frames—172 Voigtlander and 47 Lemaire. Of these 191 have been issued—68 during the last fiscal year—to the generals commanding the various military departments, inspectors of small-arms practice, and acting signal officers.

There are 256 field glasses in brass frames and 291 telscopes in use at the army posts throughout the country.

ANEMOMETER SELF-REGISTER.

Six Marvin self-registers for anemometers for use on artillery ranges were received from contractors during the year, but, owing to insufficient resistance of the electromagnets, would not work on a line of such length as would be used on some artillery ranges. The coils were rewound to 5 ohms' resistance and some slight changes made in the clock mechanism. The registers are now very satisfactory. It is recommended that six more registers be procured for issue to other artillery posts.

COMPASSES WITH CLINOMETER ATTACHMENT.

Fifty compasses with clinometer attachment were procured and have been issued to officers and sergeants of the Signal Corps as a part of their field equipment.

REQUISITIONS.

Evidence of the increased interest in the Army in military signaling is given by the large number of requisitions for signal instruments and stores. In the year just closed 355 requisitions were approved, the filling of which represents an actual cost of $14,974.53, as against 232 requisitions in 1892 at $6,302.10, and 270 in 1891 at $7,089.39. It is expected that the next fiscal year will, owing to the fact that the Army is now quite well supplied with necessary instruments and appliances for signaling, show a falling off in the number of requisitions from military posts.

EXTRACT FROM THE ANNUAL REPORT OF CAPT. JAMES ALLEN, SIGNAL CORPS, U. S. ARMY, SIGNAL OFFICER, DEPARTMENT OF THE MISSOURI.

Reports of instruction have been regularly received from various acting signal officers. They show that the requirements of the Regulations on the subject of instruction and military signaling have been complied with throughout the department. * * *

In connection with the opening ceremonies of the World's Columbian Exposition October 21, 1892, a signal detachment, consisting of First Lieut. J. E. Maxfield and six sergeants of the Signal Corps, were stationed at Jackson Park. Immediately upon their arrival at Jackson Park a telegraph office was established near the headquarters of the commanding officer in the Mines building, and direct connection made with the Western Union telegraph office. This office was maintained during the entire time that the troops were in Chicago and transacted a considerable amount of official business in connection with the movement of troops, furnishing supplies, etc. From the same office a military telegraph line was constructed to Washington Park and offices established at the saluting battery at a point midway down the line of formation of the troops and at the northwest corner of Washington Park.

To provide for means of communication for the parade of the 21st instant the following circular was issued:

Circular.

HEADQUARTERS DEPARTMENT OF THE MISSOURI,
Chicago, Ill., October 19, 1892.

To enable the commanding officer and immediate commanders to transmit and receive orders relative to movement of troops with promptness and certainty the following signal and telegraphic stations have been established on or near the line of march by the department signal officer (in coöperation with the Western Union Telegraph Company). They will be accessible to all officials for transmission of dispatches in connection with the opening ceremonies of the World's Columbian Exposition on the 21st instant.

At each point designated below orderlies will be stationed to whom will be delivered all messages for transmission and through whom all dispatches will be received by aids-de-camp and staff officers for delivery to the commanding officer.

LIST OF OFFICES.

No. 1. Auditorium Hotel, northeast corner Michigan and Congress. Orderly at Michigan avenue entrance.
No. 2. Wabash avenue, No. 515, four doors south of Harmon Court. Orderly at northwest corner of Michigan and Harmon Court.
No. 3. Michigan avenue and Twenty-second street, Lexington Hotel. Orderly at the Michigan avenue entrance.
No. 4. Indiana avenue and Thirty-first street, corner drug store. Orderly at Michigan avenue and Thirty-first street.
No. 5. Grand boulevard and Thirty-fifth street. Orderly in front of office.
No. 6. Grand boulevard and Fifty-first street. Orderly in front of office.
No. 7. Point where procession enters south open green.
No. 8. Point midway down line of troops.
No. 9. Firing point of battery near the Mere.
No. 10. Mining building, south end gallery.

No. 11. Manufactures and Liberal Arts building.
No. 12. On top of Women's building.
No. 13. Firing point of battery in Jackson Park.
By command of Major-General Miles.

CHAUNCEY MCKEEVER,
Assistant Adjutant-General.

In compliance with this circular (through the courtesy of the Western Union Telegraph Company) the telegraph offices along the line of march were established as contemplated. A flag station was established on top of the Women's building and one at firing point of salute in Jackson Park (see stations Nos. 12 and 13). The order for firing the salute in Jackson Park was communicated by telegraph and that in Jackson Park by signal.

This system of connecting the headquarters of different commands with the established line of commercial telegraph, together with connecting and outpost cable system (telephone) with the telephone exchange of the city, will be important, in connection with the employment of troops in the suppression of disorder in cities, as furnishing a certain and speedy means of obtaining accurate reports at headquarters as to the condition of affairs from all sections.

This system was established on the date referred to through the courtesy and hearty coöperation of the following Western Union officials: Mr. R. C. Clowry, vice-president and general manager; Mr. F. H. Tubbs, superintendent; Mr. W. J. Lloyd, assistant superintendent, and Mr. A. C. Murphy, superintendent city lines.

There is now on hand at these headquarters sufficient material to build and equip 10 miles of field line; also portable field kits for telephone lines.

In establishing the telegraphic means of communication in connection with the opening ceremonies of the World's Columbian Exposition, the necessity of trained men and permanent means of transportation was again made evident. Wagons could not be obtained quickly, when needed, and there is no time to instruct men detailed from the companies to assist in the construction.

I urgently recommend that a section of the field train, fully equipped and furnished with the full complement of officers and men and horses, be stationed at some post in the department.

EXTRACT FROM THE ANNUAL REPORT OF FIRST LIEUT. FRANK GREENE, SIGNAL CORPS, U. S. ARMY, CHIEF SIGNAL OFFICER, DEPARTMENT OF COLORADO.

The ordinary instruction of officers and enlisted men of the line of the Army, required by A. R. 1761, has been followed at the different posts, and at many posts the instruction has been continued for a longer time than the required two months of each year, with the result of a gain of seven officers and two enlisted men proficient at the end of the year as compared with the previous year.

The signal instruction of the year, being of the same character and practically of the same amount of that of the previous year, and the result being very similar, it can be safely assumed that the result of instruction shown in the number of officers and enlisted men proficient in signaling in this department is a fair average of what may be expected from a fair compliance with existing orders. So long as present conditions continue this course will probably keep available a number of fairly instructed men sufficient for all practical purposes, provided they could be spared from their regular duties, but as a well-instructed signalman in a troop or company is very apt to be also a good soldier, and as many of them will be noncommissioned officers, the drain upon the effective force of a command that may be called upon to furnish signal detachments will probably prove to be a serious one. The necessity for preserving and maintaining available signal detachments, who are familiar with the ranges and locations of stations, is very plain in this department; so far it has been found practicable to do so from the troops at the several posts.

With a view to testing the efficiency of the signal detachments at the posts lying along the southern border of the department, and at the same time embracing an opportunity for actual range practice, a plan for the simultaneous occupation of a line of heliograph stations extending from the Graham Mountains near Fort Grant westward to Table Mountain, thence southward to Fort Huachuca, and thence eastward to Fort Bayard, N. Mex., the distance aggregating 406 miles, was prepared in January, 1893, which, being approved, was embodied in General Orders No. 1, current series, this department. Under this order 9 officers, 16 noncommissioned officers, and 28 privates from the posts of Forts Grant, Huachuca, Bowie, and Bayard occupied with but a few days' notice, not sufficient for preliminary reconnaisance, signal stations at Graham Mountain, Table Mountain, Colorado Peak, Fort Huachuca, Fourr's Ranch, Bowie Peak, Stein's Pass, Camp Henely, and Fort Bayard, and opened communication with adjoining stations promptly on the day and at the time specified. A better test of the readiness for actual service of the different signal

detachments of the posts named could not well be had; the orders were suddenly received, were totally unannounced and unexpected, it being a season when signal practices were unlooked for; many of the officers and men engaged had never before operated at these points, but by means of the excellent heliograph maps of the department, with the aid of the compass bearings of the different stations, no difficulty was encountered in readily finding the station. The operations having been fully reported in my report of March 15, 1893, giving the names of all officers engaged, including the superintendent, Capt. Ward, First Cavalry, it is unnecessary here to make further mention of them.

During the month of September, 1892, an attempt was made by the signal detachment of the Eleventh Infantry to signal by heliograph between Mount Agassiz, in the San Francisco Mountains, north of Flagstaff, Ariz., and Whipple Barracks, an air-line distance of about 100 miles, but the haze and dust from violent winds prevented it, the outlines of the mountains being invisible much of the time. The duty of preparing cipher dispatches, contemplated in Circular 8, series of 1892, Headquarters Army, Adjutant-General's Office, having been devolved upon me by the department commander, I have prepared such dispatches to the commanders of the several posts in the department, from time to time. The cipher dispatches were sent and answered by telegraph; they were in all cases understood, and as a rule the reply was received within twenty-four hours. In the month of January, 1893, 20 new-pattern fieldglasses of superior quality, very light in weight, having tubes of aluminium, were received in the department and allotted to posts in such number as the strength of the garrison, the liability to furnish scouting parties, and the surroundings of the post rendered advisable. These glasses being very light are easily carried upon the person without fatigue, and can readily be held to the eye without tiring or straining the arms, and in these particulars far surpass the old pattern glasses.

To establish direct responsibility for these costly and valuable glasses, and to guard against their loss through neglect of proper precautions, a circular from these headquarters, dated January 24, 1893, was issued, directing that signal telescopes and field glasses should be kept in secure storerooms, under the personal care of the post acting signal officer, and should be issued only on the order of the post commander for scouting, target, or signal purposes, note of their condition upon each issue and return to be made. In this way it is intended that field glasses for proper military duty shall at all times be available instantly when wanted.

A reasonable supply of signal material, including field glasses, is kept on hand at these headquarters, from which it is possible to supply, in whole or in part, requisitions for supplies or to meet emergencies; from this stock the command of Lieut. R. B. Wallace, Second Cavalry, on special service, was supplied field glasses upon the order of the department commander in December, 1892.

During the year telephone line of standard material, with iron poles and steel cross-arms, have been constructed upon the rifle ranges at Forts Apache, Huachuca and Whipple Barracks, and equipped with modern telephones. Material and telephones were also supplied to Fort Grant and San Carlos, but at these posts the lines are not yet built, some of the material not having arrived in time for the target season.

The 15 miles of field telegraph train stored at Fort Grant has suffered a still further depletion, all of the wire, insulators, etc., having been shipped to the Department of Texas, where it was required to build a field telegraph line on the border on account of the Garza filibuster movement. This leaves this department without the section of train which it was intended should be held in readiness at Fort Grant. This deficiency should be supplied.

Telegraph material and instruments have been supplied to each post in the department except San Diego Barracks, and practice lines, varying in length from 1,100 yards, with five instruments in circuit, at Fort Marcy, to 50 yards and two instruments at San Carlos, are in operation. These lines have been of service in the instruction in telegraphy of officers and enlisted men, of whom there is an aggregate of 72 proficient as compared with 53 in the previous year.

Officers and enlisted men instructed in military signaling during the year ending June 30, 1893.

Posts.	Total number of officers.	Average number of enlisted men.	Total number of officers proficient.	Total number of officers not proficient.	Average number of enlisted men proficient.	Average number of enlisted men not proficient.	Preliminary.	Flag.	Heliograph.	Torch.	Lantern.	Total number of hours.	Average number of hours for each individual.
Fort Apache	0	9	0	0	4	5	0	79	289	0	9	377	42
Fort Bayard	2	13	2	0	5	8	91	33	195	0	0	319	21
Fort Bowie	0	8	0	0	7	1	0	0	62	0	0	62	8
Fort Grant	3	21	0	3	0	21	232	499	292	18	11	1,052	44
Fort Huachuca	0	22	0	0	11	11	782	0	2,100	0	90	2,972	135
Fort Marcy	2	8	2	0	6	2	95	192	182	0	0	469	47
Fort Stanton	0	9	0	0	3	6	24	100	0	0	0	124	14
Fort Wingate	12	21	8	4	6	15	49	206	170	0	12	437	13
San Carlos	6	10	0	0	3	7	63	42	186	24	0	315	31
San Diego Barracks	0	11	0	0	2	9	0	193	366	0	0	559	51
Whipple Barracks	0	15	0	0	14	1	120	156	164	0	0	443	23
Total	19	147	12	7	61	86	1,456	1,503	4,006	42	122	7,129	429

Number of officers and enlisted men reported on June 30, 1893, as capable of operating either flag or heliograph.

Heliograph, sending 8, receiving 5 words per minute; flag, sending or receiving, 6 words per minute.

Posts.	Officers.	Enlisted men.	Total.
Fort Apache	0	5	5
Fort Bayard	5	17	22
Fort Bowie	1	10	11
Fort Grant	5	16	21
Fort Huachuca	1	16	17
Fort Marcy	4	8	12
Fort Stanton	4	9	13
Fort Wingate	8	14	22
San Carlos	5	16	21
San Diego Barracks	0	4	4
Whipple Barracks	8	17	25
Total	41	132	173

Number of officers and enlisted men capable of operating the telegraph at a rate of fifteen words per minute sending and ten words per minute receiving.

Posts.	Officers.	Enlisted men.	Total.
Fort Apache	0	7	7
Fort Bayard	0	4	4
Fort Bowie	1	6	7
Fort Grant	2	12	14
Fort Huachuca	1	6	7
Fort Marcy	2	4	6
Fort Stanton	1	4	5
Fort Wingate	1	3	4
San Carlos	1	7	8
San Diego Barracks	0	2	2
Whipple Barracks	5	3	8
Total	14	58	72

Number of officers reported as proficient in signaling with either flag or heliograph on June 30, 1893.

Regiment.	Company or troop.												Remarks.
	A.	B.	C.	D.	E.	F.	G.	H.	I.	K.	L.	M.	
First Cavalry:													
Officers	(*)	0	1	0	1	1	0	1	1	2	(*)	(†)	
Enlisted men	(*)	2	3	2	5	3	2	1	2	7	(*)	(†)	
Second Cavalry:													
Officers	1	0	1	1	0	0	1	1	1	0	1	(†)	Adjutant proficient.
Enlisted men	3	6	0	4	4	0	1	3	4	2	(*)	(†)	
Tenth Infantry:													
Officers	(*)	2	0	1	2	(*)	2	1	(*)	(*)	....	....	1 regimental staff officer proficient.
Enlisted men	(*)	4	4	4	4	(*)	5	3	(*)	(*)	....	....	
Eleventh Infantry:													
Officers	2	0	2	2	3	0	2	1	(*)	(*)	....	....	
Enlisted men	5	3	4	4	8	2	4	1	(*)	(*)	....	....	
Twenty-fourth Infantry:													
Officers	1	0	0	0	0	1	2	0	(*)	(*)	....	....	Regimental quartermaster proficient.
Enlisted men	2	4	2	3	2	3	5	7	(*)	(*)	....	....	

* Company or troop not serving in department.
† Company or troop is Indian or skeleton.

Description of telephonic or other signal communication upon rifle ranges.

Posts.	Number of telephones.	Remarks.
Fort Apache	2	Telephones have call boxes and transmitters; length of telephone line on range, 850 yards; line is constructed of iron poles carrying cross arms and No. 14 iron wire; instruments are in a metallic circuit. One telephone is permanently at the butt during practice; another is placed in line near the 200, 300, 500, 600, and 800 yard firing points as required.
Fort Bayard	3	Telephones have call boxes and transmitters; length of line on range, 600 yards; line is constructed of wooden poles and No. 14 iron wire; instruments are placed in a metallic circuit; one telephone is permanently at the butts during practice; another is connected at the different firing points at 200, 300, 500, and 600 yards.
Fort Bowie	0	No telephonic communication on rifle range at this post.
Fort Grant	2	Telephone line not built, material not having arrived in time for target practice.
Fort Huachuca	2	Telephones have call boxes and transmitters; length of line on target range, 800 yards; line is constructed of iron poles and No. 14 iron wire. Cross arms intended for line at this post did not arrive in time to place in line before target practice commmenced. One telephone is placed at the butts during practice; the other is connected at the 200, 300, 500, 600, and 800 yard firing points as required.
Fort Marcy	0	No telephonic communication on rifle range.
Fort Stanton	0	Do.
Fort Wingate	4	Telephones have call boxes and transmitters; line is built of wooden poles and No. 9 iron wire. The movable telephones are connected at the 200, 300, 500, and 600 yard firing points as required.
San Carlos	2	Telephone line at this post not yet built, some of the material not having arrived in time for the season's practice.
San Diego barracks	0	No telephone line on rifle range.
Whipple barracks	2	Telephones have call boxes and transmitters; length of telephone line on rifle range, 600 yards; line is constructed of iron poles and No. 14 iron wire. Cross arms intended for this line did not arrive in season to be used. During practice one telephone is connected at the targets; the other is placed in line at the 200, 300, 500, and 600 yard firing points as required.

Description of local telegraph practice lines.

Posts.	Length of line.	Number of instruments in circuit.	Remarks.
	Yards.		
Fort Apache	440	4	Line extends from post hospital to farthest barracks along the line of company quarters.
Fort Bayard	450	5	Line extends from the quartermaster's storehouse to post exchange, passing through company barracks.
Fort Bowie	800	5	Line extends entirely around the garrison. There are instruments on the line in the telegraph office, in the barracks of both troops, in the quartermaster's stables, and in the stables of Troop I, Second Cavalry.
Fort Grant	500	2	Line extends from signal office to corral of Troop G, First Cavalry.
Fort Huachuca	500	2	Line extends from barracks of E troop, Second Cavalry, to barracks of Company C, Twenty-fourth Infantry.
Fort Marcy	1,100	5	Line extends from Lieut. Kirby's quarters to D company, Tenth Infantry, adjutant's office, adjutant's quarters, B company, Tenth Infantry, and weather bureau office in city. The line also includes a circuit in the city of about 2 miles in extent.
Fort Stanton	300	3	Line extends from quarters Company E, Tenth Infantry to quarters Company G, Tenth Infantry, via line of officers' quarters.
Fort Wingate	800	5	Line extends from officers' quarters to and along line of barracks.
San Carlos	50	2	Line extends from one building to another of the quarters of Company E, Eleventh Infantry.
San Diego Barracks	.....	.....	No local telegraph practice line.
Whipple Barracks	250	2	Line extends from an office in the post administration building to the telegraph line belonging to the P. & A. C. R. R. Co.

EXTRACT FROM THE ANNUAL REPORT OF FIRST LIEUT. J. E. MAXFIELD, SIGNAL CORPS, IN CHARGE OF SCHOOL OF INSTRUCTION FOR SIGNAL SERGEANTS AT FORT RILEY, KANS.

"The work of instruction of the signal sergeants has been carried on upon the same general plan as during the preceding year. The endeavor has been not only to make each man a skilled signal man and good telegraph operator, but also to give him a thorough knowledge of the principles involved in the construction of telegraphic and telephone instruments together with the ability to make all necessary repairs to such instruments.

"The course of instruction has embraced the following subjects: Electricity and telegraphy, telephones, military surveying and signaling. The text-books used were: Modern Practice of the Electric Telegraph, Pope; Hand Book of Practical Telegraphy, Culley; Hand Book of Electric Telegraphy, Lockwood; The Telephone, Preece; Manual of Signals, Myer; International Code of Signals, Military Surveying, Richards, and Instructions to Operators.

"Instruction in the use of the galvanometer in testing has also been given to men likely to be benefited thereby.

"During the first four months of the course of instruction, a recitation is held daily on the foregoing subjects, and is followed by an hour's work of a practical nature illustrative of the subject-matter of the recitation. This work has comprised the setting up of batteries, repeaters, switch boards, and other telegraphic instruments, call bells and telephones and the repairing and testing of the same, the construction of telephone transmitters and other instruments, signaling at short ranges, climbing, splicing, etc. To this is added, daily, three hours of telegraph practice. This course is supplemented by two months' field work, comprising signaling with the flag, torch, heliograph, flash lanterns, and rockets, together with map making and sketching. Although nearly all men reporting for instruction are telegraph operators, and have some knowledge of signaling, a comparison between instructed and uninstructed men, both at this post and in the field, together with such information as could be obtained from posts at which signal sergeants are serving, shows that the value of a man's service is greatly increased by the course of instruction, and it is believed that it would be to the interest of the service to hasten the instruction of the sergeants of the Signal Corps until all have been instructed, even if it were necessary for a time to replace some of them at telegraph stations by civilian employés.

"The generous supply of instruments and books of reference furnished the school by the Chief Signal Officer has left little or nothing to be desired in the way of equipment.

"During the year tests have been made, by the direction of the Chief Signal Officer, of various instruments and line material. The most important of these were trials of several forms of flash lanterns, experiments as to the adaptability of Army wagons for use as field-telegraph wagons, and tests of the suitability of bamboo poles for use as field-telegraph lances.

"On October 16, 1892, the detachment left Fort Riley for Chicago, for duty in connection with the dedicatory ceremonies of the World's Columbian Exposition. Here a telegraph office was established in the Building of Mines, giving telegraphic facilities to the troops quartered in that building. A short flying telegraph line was also erected connecting the Mines Building with the entrance to Washington Park, which was used in transmitting the firing signal to the battery detailed to fire the salutes. The detachment returned to Fort Riley on the 25th of the same month.

"Instruction ceased early in January, the detachment at that time being ordered into the field in the department of Texas for the purpose of constructing and operating a temporary telegraph line along the Rio Grande River. This line extended from Fort McIntosh to Lopeña Ranch, a distance of 75 miles, and is still in operation, awaiting the construction of the permanent line recently contracted for. With four men I returned to Fort Riley on June 5, leaving five men as operators and repairmen.

"In addition to my other duties, instruction in signaling has been given to the post signal detail during the months of August and November. Thirty-eight enlisted men have been instructed, each man having about forty-one hours of actual practice with the flag, torch, or heliograph. Of these, fourteen were pronounced proficient at the above practice, while practically the whole detail could signal well with the flag at ordinary ranges. During my absence from the post further instruction was given by the acting signal officer. Instruction of officers was provided for in the course of instruction of the cavalry school, but was omitted, owing to my absence from the post."

Very respectfully,

CHAS. E. KILBOURNE,
Captain, Signal Corps.

The CHIEF SIGNAL OFFICER U. S. ARMY,
Washington, D. C.

APPENDIX C.

REPORT OF THE DISBURSING OFFICER.

WAR DEPARTMENT, SIGNAL OFFICE,
Washington, D. C., July 1, 1893.

SIR: I have the honor to submit the following report for the fiscal year ended June 30, 1893:

PERSONNEL.

Under Special Orders, No. 49, dated Headquarters of the Army, Adjutant-General's Office, Washington, March 4, 1891, I have continued on duty as disbursing officer during the fiscal year.

My duties have been of a double character, that of disbursing officer and in charge of the general depot of signal supplies for the whole Army.

Sergt. H. L. Boyce, Signal Corps, has continued on duty as storekeeper, and Sergts. D. W. Peters and H. W. Stamford, Signal Corps, as assistants to the storekeeper.

CHARACTER OF WORK.

The work consisted of the preparation of the estimates for appropriations; the preparation of specifications (in part) and advertisements for proposals to furnish supplies; the preparation of orders and letters authorizing purchases and expenditures; the preparation of contracts and leases; the purchasing, receiving, packing, and shipping of all supplies; the handling and record of registered mail matter; the record and settlement of accounts payable from the Signal Service appropriations; the preparation of the money accounts and property returns of the disbursing officer; the record of receipts and expenditures of money and the condition of appropriations; the writing, recording, and mailing of letters sent relating to the above.

CORRESPONDENCE.

The total number of letters written, including 122 indorsements, is 1,651.

ESTIMATES.

As required by law estimates for appropriations for the fiscal year ending June 30, 1894, were submitted to the Secretary of War on September 30, 1892. By combining the estimates for signal service of the Army and for military telegraph lines it has been possible to reduce the total from $22,500 to $22,000. Estimates for deficiencies have not been necessary. A special estimate for the construction of a military telegraph line from Fort Ringgold, Tex., to Fort McIntosh, Tex., was submitted on January 6, 1893.

ADVERTISEMENTS AND PROPOSALS.

During the year twenty-three advertisements, in the usual form of the printed letter, have been sent out inviting proposals for furnishing the Signal Corps with the various articles required. In no case has it been found necessary to enforce the penalty prescribed for delay in delivery.

EXPENDITURES.

The rule that no indebtedness should be contracted without the written authority of the Chief Signal Officer, excepting in cases of emergency, has been continued. At the beginning of the fiscal year authorities were issued to cover the expenses of the various stations for the year so far as they could be foreseen. These were attached to the first accounts rendered, and on subsequent accounts reference was made to the first.

REQUISITIONS AND ORDERS.

During the year the following requisitions were made upon the supply division of the War Department:

For books and periodicals	6
For miscellaneous articles	20
For stationery	26
Total	52

The following authorities were issued:

Orders on contractors	200
Letters to stations	39
Total	239

There have been filled requisitions for property from 30 telegraph stations and 94 army posts to the number of 477. At the close of the year 32 requisitions remained unfilled, mostly for the calendar year 1894.

CONTRACTS.

As required by the act of Congress approved April 21, 1808 (Stat. L, Vol. 2, p. 435), I submit herewith a list of contracts and leases made during the fiscal year ended June 30, 1893:

With whom made.	Place.	Contract.	For what purpose.
Julien P. Friez	Baltimore	Contract	Heliographs.
J. H. Theimeyer & Co	do	do	Packing boxes.
The Friedenwald Co	do	do	Stationery.
American Desk Seating Co	Chicago	do	Bookcase.
The E. S. Greeley & Co	New York City	do	Electric bells and push-buttons.
Do	do	do	Gethins' battery cells.
Do	do	do	Iron cross-arms.
Do	do	do	Telegraph supplies.
Do	do	do	H. R., insulators, steel spikes, and leather straps.
Chas. H. Pleasants	do	do	Heliograph mirrors.
Manhattan Supply Co	do	do	Insulator plugs.
Do	do	do	Stationery.
Levy, Dreyfus & Co	do	do	Field glasses.
Keuffel & Esser Co	do	do	Heliograph screens.
Do	do	do	Canvas cases for signal blanks.
Sussfeld, Lorsch & Co	do	do	Pocket compasses.
Bishop Gutta-Percha Co	do	do	2 conductor cables.
J. H. Bunnell & Co	do	do	Telegraph instruments.
E. J. Brooks & Co	do	do	Shears and tape.
Homer P. Beach	do	do	Stationery.
E. J. Brooks & Co	do	do	Wicking and twine.
Henri Lachambre	Paris, France	do	Balloon.
Morris, Tasker & Co	Philadelphia	do	Iron telegraph poles.
Detre & Blackburn	do	do	Stationery.
Queen & Co	do	do	Signal lantern.
F. S. Cahill & Co	Washington	do	Repairing and altering outpost cable reels.
W. H. Houghton Mfg. Co	do	do	Brussels rug.
Jas. S. Topham	do	do	Heliograph cases.
Wm. Ballantyne & Sons	do	do	Stationery.
Royce & Marean	do	do	Telegraph supplies.
Chas. T. Carter & Co	do	do	Hardware.
Wyckoff, Seamans & Benedict	do	do	Typewriter ribbons.
Geo. Ryneal, jr	do	do	Lamps, etc.
P. Nash	do	do	Soap and wands.
Do	do	do	Drum for balloon wagon.
Wm. J. Bacon	do	do	Engraving field glasses scopes.

SHIPMENTS AND RECEIPTS.

There have been made to stations and military posts 4,229 shipments by mail, and 79 (consisting of 432 boxes) through the Quartermaster's Department. There have been received from contractors 262 consignments, and from stations and military posts 141.

SALES OF CONDEMNED PROPERTY.

June 27, 1893, at Washington, telegraph and other instruments, tools, cart, etc., $88.20.

ACCOUNTS SETTLED.

The number of accounts settled during the year is—

Months, 1892.	Number.	Months, 1893.	Number.
July	37	January	68
August	37	February	48
September	41	March	34
October	33	April	53
November	44	May	33
December	29	June	36
		Total	493

The number of checks drawn in payment of accounts is 466. So far as known, none have miscarried in the mails.

ACCOUNTS UNSETTLED.

On June 30, 1893, there were in the office two unsettled accounts, for want of completion.

INSPECTION OF MONEY ACCOUNTS.

My money accounts were inspected and the balances verified by Lieut. Col. H. W. Lawton, inspector-general, to include July 12 and December 6, 1892, and June 23, 1893.

ALLOTMENTS FOR CONTINGENT EXPENSES AND STATIONERY.

The amounts allotted to this Bureau, under circular of August 17, 1892, are: Stationery, $300; contingent expenses, $375. Under the latter head $50 additional was allotted by the Secretary of War, in letter dated February 13, 1893.

CONDITIONS OF APPROPRIATIONS.

The method heretofore used of keeping a record of all liabilities incurred has been continued, so that at any moment it has been possible to ascertain the balance available of any of the appropriations. As required by paragraph 1319, U. S. Army Regulations, 1889, a cashbook has been kept in which will be found entered under the various appropriations the amounts received and disbursed with dates. The balances shown by the cashbook are verified daily by comparison with the check book.

The condition of the appropriations for the fiscal year ended June 30, 1893, with the expenditures thereunder, balances, and probable demands on such balances, report of which is required to be rendered by the act of Congress, approved May 20, 1820, is as follows:

Appropriated: Signal Service of the Army, 1893	$22,000.00
Expended: Signal Service of the Army, 1893 (including $1,970 placed to the credit of Lieut. W. A. Glassford, Signal Corps, Paris, France, for purchase of balloon, etc.)	18,790.17
Balance: Signal Service of the Army, 1893	3,209.83
Probable demands: Signal Service of the Army, 1893	3,084.02

Very respectfully,

ROBT. CRAIG,
Captain Signal Corps, Disbursing Officer.

The CHIEF SIGNAL OFFICER, U. S. ARMY,
Washington, D. C.

APPENDIX D.

REPORT OF THE OFFICER IN CHARGE OF EXAMINER'S DIVISION.

WAR DEPARTMENT, SIGNAL OFFICE,
Washington City, July 1, 1893.

SIR: I have the honor to submit the following report covering the operations of the examiner's division of the Signal Office during the fiscal year ending June 30, 1893:

The money and property papers of all persons accountable to the Government for Signal Corps funds or property have been carefully audited, resulting in the sum of $252.83 being covered into the U. S. Treasury as reimbursement for loss of property.

Owing to the systematic manner in which money and property accounts are now audited, this branch of the office work is in a most satisfactory condition. At the close of the fiscal year the work was up to date.

The following data are submitted, showing in a condensed form the large amount of work performed during the year:

Summary.

Accounts current received and audited	80
Vouchers accompanying accounts current examined	3,374
Property returns, acting signal officers, sergeants, Signal Corps, and other persons	488
Vouchers accompanying property returns	3,075
Letters sent relative to money and property accounts	522
Certificates of deposit received, recorded, etc.,	48
Statement of remittances received, recorded, etc.,	221
Acknowledgments of money and property papers	542

Very respectfully,

C. E. KILBOURNE
Captain, Signal Corps Examiner.

The CHIEF SIGNAL OFFICER, U. S. ARMY,
Washington, D. C.

REPORT OF THE CHIEF OF THE RECORD AND PENSION OFFICE.

REPORT

OF THE

CHIEF OF THE RECORD AND PENSION OFFICE.

RECORD AND PENSION OFFICE,
WAR DEPARTMENT,
October 25, 1893.

SIR: In the last annual report of the Record and Pension Office, which was also the first annual report of the office as now constituted by law, considerable space was given to the conditions preceding and resulting in the present organization and to the results accomplished by the new methods of business adopted, which were described somewhat in detail. It was shown that within three months after the organization of what now constitutes the Record and Pension Office the arrears of more than 40,000 cases on hand at the date of organization, in July, 1889, had been disposed of and that at the close of the fiscal years ended June 30, 1890, June 30, 1891, and June 30, 1892, not a single case of any kind remained on hand and undisposed of.

During the last fiscal year the same methods of business have been continued and with the same satisfactory results. The current work of the office has been kept closely up to date, all inquiries and other cases for action having been promptly answered and disposed of, generally within twenty-four hours from the time of their receipt, while, with the exception of a short interval, hereinafter to be referred to, when interrupted by a serious calamity that befell the working force, the clerks not required for the transaction of the current business have been kept constantly employed in the work of reproducing, by the index-record card system, the military records of officers and enlisted men contained in the worn and mutilated rolls of the volunteer armies.

The cases received and disposed of during the year were, in detail and by classification, as follows:

From the Pension Office	137,563
From the Second Auditor	27,759
Remuster cases	2,186
Desertion cases	7,438
All other cases, miscellaneous	28,758
Total	203,704
Cases on hand June 30, 1893	None.

By a comparison of these figures with those given in the last annual report it will be observed that there has been a reduction in the number of cases received during the last fiscal year as compared with the number received during the three years next preceding. This reduction is due largely to the fact that the bulk of the pension claims arising

under the act of June 27, 1890, has apparently been filed and the required reports of military service have been furnished to the Commissioner of Pensions. But the reduction in labor is more apparent than real, and there is reason to believe that the number of cases and the actual labor required for their disposition will be considerably increased during the present fiscal year. Under a recent ruling of the Interior Department as to the proper construction of the act cited (that of June 27, 1890) the claims of surviving soldiers arising under that act which have already been reported on are being reconsidered, and it is believed that a majority of the cases in which certificates have been issued will be again referred to this office for the full military and medical history of the claimants. These cases are now being received in large numbers, and as they require for their reconsideration a much more comprehensive report than was necessary to their original adjudication under the then existing practice of the Pension Bureau, they will add very largely to the labor of this office, especially as they are so much in addition to the ordinary current work to be expected from the filing of new claims under both the old law and the new.

The actual labor of the office has been, and is being, considerably augmented by the act of July 27, 1892, giving a pensionable status to the survivors of the various Indian wars and to the widows and orphans of the officers and enlisted men who served in those wars. This labor consists not so much in the preparation of military histories of officers and men as in the determination of questions frequently arising as to whether or not the soldier, or the organization to which he belonged, was in the military service of the United States at the time the service was rendered, and whether he served the requisite time to give him a pensionable status under the law. The determination of these questions is often difficult and perplexing by reason of the meager and imperfect character of the records of the militia and volunteer organizations employed for short periods and at intervals during the Indian disturbances, involving, in many instances, a laborious and extended search of the ancient records of departmental correspondence, state papers and the enactments of Congress.

Besides these questions connected with service in the Indian wars, similar questions relating to troops employed during the war of the rebellion are constantly arising, the determination of which, as well as many others not easily classified, involves an amount of labor not adequately represented in statistical reports of cases received and disposed of.

INDEX-RECORD CARD WORK.

The work of reproducing the individual military records of officers and enlisted men of the volunteer service by the index-record card system was fully described in the last annual report. At the close of the fiscal year ended June 30, 1892, the rolls of all the States but Pennsylvania, Ohio, Indiana, and Illinois had been carded according to this system. Work had also been begun on the State of Pennsylvania. During the last fiscal year the rolls of Pennsylvania, Ohio, and Indiana were carded, and work was begun on the records of Illinois. At the date of this report work on the rolls of the latter State is in progress and will be completed within a few weeks, leaving of the volunteer rolls now on file in this Department to be included in the card system, those of the Veteran Reserve Corps and other United States volunteers, besides the post, detachment, and miscellaneous rolls. These are of uncertain quantity, difficult of estimation.

During the last Congress, by an enactment approved July 27, 1892, it was provided "that the military records of the American Revolution and of the war of 1812, now preserved in the Treasury and Interior Departments, be transferred to the War Department, to be preserved in the Record and Pension Division [Office] of that Department, and that they shall be properly indexed and arranged for use."

The records whose reproduction by the index-record card system is contemplated by this enactment have not yet been transferred to this Department, and, their volume not being known, the time required to include them in the general system of index-record cards can not be estimated with any degree of accuracy.

It may here be remarked that the value and utility of this system of reproducing and preserving the records of the military service is becoming more manifest as the work approaches completion and the results are made available in the current business of the Department. Besides the preservation of the original records from destruction and the advantages afforded for the discovery and reproduction of individual military histories, as pointed out in former reports, much has been gained, by the scrutiny to which the records have been subjected, in a more perfect knowledge of the real status of military and semi-military organizations and their individual members; and in numerous instances it has been discovered that organizations which were not in the military service of the United States have in the past been given recognition, by departmental action, as United States troops, while other troops, which have heretofore been denied recognition as United States soldiers, have, upon investigation, been found to be entitled to such recognition. In such cases the rolls of the former class of troops have been placed where they will receive only the consideration to which they are entitled, while those of the latter class have been given a place with the records of troops in the United States service. This determination of the military status of the several classes of troops has been an important feature of the carding of the records, and one that has required much time and research for its accomplishment.

During the fiscal year 8,421,478 index-record cards were made and placed on file. This number, added to the cards filed in previous years, makes a total of 35,099,755 index-record cards, and all so filed that the cards relating to any one individual soldier can readily be found.

DISASTER AT TENTH STREET BUILDING.

Reference has been made in this report to a serious calamity that has befallen the clerical force of the office during the past year and by reason of which the work of carding the military records was temporarily interrupted. On the 9th of June, 1893, at about 10 o'clock a. m., while the clerks in the building on Tenth street, known as Ford's Theater building, were engaged in their work, portions of the floors of the second and third stories of the building fell, carrying with them many of the clerks and resulting in the death (immediately or within a few days thereafter) of twenty-two persons and the more or less serious maiming of many others.

This terrible disaster was the more appalling because danger had not been anticipated. The building was an old one, but had been repeatedly examined by experts and pronounced entirely safe. It was purchased by the Government in 1866, was entirely remodeled, and has since been used by the War Department for various purposes, principally for the storage of the Army Medical Museum, the library of the

Surgeon-General's office, the medical records of the Army and the accommodation of the officers and clerks employed in connection therewith. Some time after the building came into the possession of the Government a considerable expenditure was made upon it in the way of thoroughly strengthening its walls, and for many years subsequently its floors bore with perfect safety the immense weight of the museum, library, and hospital records, but all of these had been removed from the building several years before the catastrophe occurred.

As the weight of the clerks employed in the building was many times less than that removed therefrom, there was no ground for apprehension that the building was not a safe one for the purpose for which it has latterly been used, viz, for office purposes for the use of clerks and the storage of the few records upon which they were at the time being engaged in copying. For the comfort and convenience of the clerks so employed it became desirable to supply the building with electric lights and ventilating fans, and for this purpose an excavation was made under the building by a contractor to whom this necessary part of the work had been intrusted. This work included the underpinning of certain piers upon which the floors in part rested, and it was during the progress of this work, and probably in consequence of it, that the disaster occurred. In a substantial building as this was known to be, and under the superintendence of a competent builder, there was no reason to believe that the work was not entirely safe and free from danger to the persons occupying the building at the time. That the confidence felt in the safety of the building during the progress of this work was not well founded is shown by the unfortunate results that followed.

The families of some of the killed in this most deplorable accident are understood to be in a destitute condition, and the widows and orphans of those whose lives were thus sacrificed in the public service, and those who were seriously injured, are earnestly commended to the generosity of the Government.

Very respectfully,

F. C. AINSWORTH,
Colonel, U. S. Army, Chief, Record and Pension Office.

The SECRETARY OF WAR.

REPORT OF THE WAR RECORDS' BOARD OF PUBLICATION.

REPORT

OF

PUBLICATION OF WAR RECORDS.

WAR DEPARTMENT, WAR RECORDS OFFICE,
Washington, June 30, 1893.

SIR: The Board of Publication of the Official Records of the Rebellion begs leave to submit the following report of its operations during the fiscal year ending June 30, 1893:

Eleven thousand copies each of Volumes XXXIX, Parts II and III; XL, Parts I, II, and III, and XLI, Parts I and II, and 7,500 copies each of the reprint of Volumes I to V, inclusive (authorized by the act of August 5, 1892, for the purpose of completing incomplete sets), have been printed and bound by the Public Printer, and have been delivered to and distributed from the document room of the War Records Office during the year ending June 30, 1893. Five more volumes were printed and are in different stages of indexing at the close of the year. These books cover the operations in Kentucky, southwest Virginia, Tennessee, Mississippi, Alabama, and north Georgia (the Atlanta campaign excepted), May 1 to November 13, 1864; the operations in southeast Virginia and North Carolina, June 13 to July 31, 1864 (including Richmond, Petersburg, etc.); the operations in Louisiana and the transmississippi States, etc., July 1 to December 31, 1864; the operations in Southeast Virginia and North Carolina, August 1 to December 31, 1864 (including Richmond, Petersburg, etc.); the operations in northern Virginia, West Virginia, Maryland, and Pennsylvania, August 4 to December 31, 1864 (including Opequon, Fisher's Hill, Cedar Creek, etc.).

Of the edition authorized by the act of August 5, 1892, for the use of Congress, 500 copies each of 38 books have been printed, and 17 of these have been bound, and distributed through the document rooms of the House and Senate.

Work on the Atlas of maps and plans has also been carried forward, and Plates XXI and LXXX, inclusive (Parts V to XVI,) have been printed and distributed during the year. Twenty-five more are in the hands of the engraver, and will be issued during the current calendar year.

The examination of files and archives, and the work of selecting, copying and comparing material for the remaining volumes of the several series has been continued without interruption during the entire fiscal year. The following notes of work accomplished in the several departments of publication will convey an idea of the variety and

amount of labor required in connection with the preparation and publication of the several volumes. One hundred and fifteen thousand five hundred books have been received, and 78,704 have been distributed; 132,000 copies of Parts V to XVI of the Atlas to accompany the Official Records of the Rebellion have been received, and 122,836 have been sold and distributed; 9,040 letters, cards, etc., have been received and 15,739 letters, cards, circulars, etc., have been mailed in response to inquiries; 223,812 labels have been prepared, and 184,592 labels have been compared and verified during the year. During the same period 11 books have been indexed wholly or in part (550,000 cards having been used for this purpose), and the general index to the work has been carried forward to the close of the year 1863. Fifty-four thousand one hundred and sixty-five folios of manuscript have been copied and compared; 25,000 pages of proofs, in galleys and page form, have been examined, and 42,000 sheets of manuscript have been verified, corrected, and prepared for publication.

Satisfactory progress has been made in the work of indexing the Confederate Archives. A modification of the excellent system of card indexing now in use in the Record and Pension Office has been applied to the letters, orders, vouchers, muster rolls and returns which make up the collection, and it is hoped to finish the work during the coming fiscal year.

The inquiry instituted by this office to ascertain what societies or persons were entitled to receive the reprint of the volumes authorized at the first session of the Fifty-second Congress has developed the fact that about 500 of the original 11,000 beneficiaries have, by reason of death or removal, ceased to receive the sets originally assigned them. The result is that, beginning with Volume XXX, there are on hand 500 sets of the work which are not available for distribution on account of the absence of the earlier volumes. As the stereotype plates have been preserved, it is estimated that it will cost less than 50 cents per volume to reprint these books, and thus complete and make available for distribution the sets to which they belong. It is therefore respectfully recommended that authority be obtained for reprinting 500 copies of Volumes I to XXX, inclusive, with a view to their distribution by members of the Fifty-third Congress.

The inquiry for complete sets of the work, and for separate volumes from societies and individuals who desire to purchase them, steadily increases. To meet this demand it is respectfully recommended that authority be obtained for printing 1,000 copies of the entire work from the plates now in the hands of the Public Printer.

In closing, it again gives the Board great pleasure to recognize the efficient assistance it has received from the officers engaged on the work, and from the employés connected with the different departments of the office. Their labors have been zealous and untiring and the services rendered by them have been entirely satisfactory.

GEO. B. DAVIS,
Major and Judge-Advocate U. S. Army.
LESLIE J. PERRY,
Civilian Expert.
J. W. KIRKLEY,
Civilian Expert.

The SECRETARY OF WAR.

BOARD OF COMMISSIONERS OF THE SOLDIERS' HOME.

REPORT

OF THE

BOARD OF COMMISSIONERS OF THE SOLDIERS' HOME.

THE SOLDIERS' HOME,
OFFICE OF THE BOARD OF COMMISSIONERS,
Washington, D. C., October 23, 1893.

SIR: In compliance with section 1 of the act of Congress approved March 3, 1883, prescribing regulations for the Soldiers' Home in the District of Columbia, I have the honor to submit the following report of the Board of Commissioners of the Soldiers' Home for the year ended September 30, 1893:

The following statement shows the gain and loss in the number of inmates during the year:

	Regular.	Temporary.	Total.
On the rolls September 30, 1892	980	209	1,189
Admitted since	173	339	512
Readmitted since	171	.....	171
Total	1,324	548	1,872
Withdrawn from the Home	153	.....	153
Dropped, dismissed, etc	110	261	371
Died	54	10	64
Transferred to permanent roll	.....	204	204
Total	317	475	792
Number on the roll September 30, 1893	1,007	73	1,080

The total number of inmates September 30, 1893 (1,080), are accounted for as follows: Present at the Home, 710; on outdoor relief, 299; on furlough, 45; in the Government Hospital for the Insane, 18; suspended, 8. The daily average number of inmates during the year was 751; last year, 745, and the preceding year, 718.

Of the 64 deaths reported, 38 died at the Home, 14 were members absent on outdoor relief, 4 in the hospital for the insane, 7 in Washington, and 1 was accidentally killed while on furlough.

Temporary relief to destitute discharged soldiers who were not entitled to regular admission was given during the year to the extent of 3,720 meals and lodgings for a few nights to 176 men.

Outdoor relief was withdrawn from members who are either receiving pensions from the Government of $8 or more per month or who have property or employment which places them beyond actual need,

as such aid can be given only to men who are in absolute need of assistance to maintain themselves, the current income of the Home being insufficient to permit a more liberal extension of this benefit.

The condition of the funds of the Home, and the receipts and expenditures during the year, are as follows:

THE PERMANENT FUND.

Balance in the United States Treasury October 1, 1892		$2,489,940.81
Settlements for the current year and of old accounts placed to the credit of the fund	$146,402.51	
Withdrawn on requisitions for current expenses	157,000.00	
Excess of expenditures over receipts		10,597.49
Balance in the United States Treasury September 30, 1893		2,479,343.32

ACCOUNT OF THE TREASURER OF THE HOME.

Remaining on hand September 30, 1892		2,164.36
Received during the year:		
From the permanent fund		157,000.00
Interest on the permanent fund		74,393.81
Effects of deceased inmates		202.66
Miscellaneous receipts		4,013.72
Total		237,774.55
Disbursements:		
Current expenses	$196,579.36	
Permanent improvements	25,688.04	
Total		222,267.40
Balance on hand September 30, 1893		15,507.15

The foregoing statement of the condition of the permanent fund shows a decrease in the amount passed to its credit by the Treasury Department of $26,551.96 from the amount credited to it the preceding year; also the decrease of the permanent fund by $10,597.49, due to the necessary expenditures made for permanent improvements. The current expenses, as shown, were $196,579.36 ($170.48 more than last year), and the total amount expended, which includes the expenditures for all improvements made, was $222,267.40. The current income of the Home amounted to $213,817.44, but to this was added $11,195.26, the amount found due in the settlement of the last of the old accounts; hence, hereafter, the Home has to depend solely upon its current sources of income, the amount and percentage of each item of which were as follows during the year:

Item.	Amount.	Per cent.
On account of deserters and dishonorably discharged men	$19,360.72	9.05
From court-martial fines (estimated)	80,000.00	37.41
Deductions of 12½ cents (estimated)	35,846.53	16.76
Interest on permanent fund	74,393.81	34.79
Effects of deceased inmates and from miscellaneous sources	4,216.38	1.97
Total	213,817.44	100.00

The Treasurer's statement of funds received for the inmate pensioners shows that he had on hand, last report, $49,443.15; received during the year, $96,287.47; paid to pensioners and legal heirs, $95,915.28;

leaving on hand in the Treasury, $49,815.34. This statement shows that all but $372.19 of the $96,287.47 received was paid by the Treasurer to the individual pensioners, thereby providing, by the operation of the existing law, ample means for idle and, in some cases, vicious indulgence harmful to themselves and highly detrimental to the discipline of the Home. The Commissioners are of the opinion that Congress never intended to make the double provision now fully enjoyed by many of the inmate pensioners who are comfortably lodged, fed, and clothed at the expense of the Home while they draw their pensions, in some cases amounting to $36 per month, which they spend without being taxed in the slightest degree for their support. This makes the Home a standing inducement for pensioners to seek admission thereto, and while it is just and proper that men disabled in the service should be pensioned according to the degree of disability incurred, it is believed to be also proper that pensioners receiving more than $8 per month should be required to pay partly, at least, for their support. The Commissioners will therefore submit to the Secretary of War at an early day the draft of a bill providing that pensioners who receive $16 and more per month shall pay to the Home the cost of their food and clothing ($8 per month), and that all receiving less than $16, but more than $8, shall pay the difference between the amounts received and $8. To show how far pensioners have availed themselves of the benefits of the Home it is stated in the governor's report that of the 710 inmates now present 584 are drawing pensions, as follows: 151 are receiving from $16 to $36 per month, 274 from $10 to $15, and 159 from $2 to $8. The latter class are not affected by the proposed bill.

The capacity of the Home for the accommodation of men entitled to admission is about 780, and no greater number can be suitably cared for without crowding the inmates. This was proved last winter, when there were at one time over 800 men in the Home and beds had to be placed in gatehouses and other unsuitable places to provide for the excess. The Commissioners therefore found it necessary to order the discharge of the retired soldiers who had availed themselves of the privileges of the Home in order to provide room for men entitled to admission and who had no means of support.

Through the courtesy of the Agricultural Department the services of Dr. Theobold Smith, chief of the division of animal pathology, were secured in March last, with those of Drs. Kilbourne and Schroeder, of that Department, and a very scientific and exhaustive examination was made of the Home dairy herd, under the supervision of Lieut. Col. W. H. Forwood, the attending surgeon. The investigation, which extended over a peried of nearly four months, was made in order to determine the full character and extent of the disease in the herd known as tuberculosis, of which some of the cattle had died from time to time.

In the inspection made by these gentlemen of the 60 animals in the herd, 52 were found to be infected with tuberculosis and had therefore to be killed, the disease being reported as a progressive and an incurable malady; although in its earliest stages, it being restricted to a small region of the lungs, the flesh in such incipient cases is free from disease and in every sense as good as that from perfectly healthy cattle.

After a very complete investigation of the disease Dr. Smith and the attending surgeon recommended, with the view of further testing the facts developed, and in the interest of science, that the remaining 8 cattle be killed and be used at the Home, if found upon post-mortem

examination to be fit for food, and this was accordingly authorized by the Commissioners.

Through this necessary sacrifice of the whole dairy herd the Home is now compelled to purchase the milk required for the inmates, it having been decided by the Commissioners to defer the purchase of a new herd of cattle for the present.

There has been for some years past a steadily increasing necessity for a large increase in the water supply at the Home, and as every effort made to obtain a larger supply by boring artesian wells proved unsuccessful, the Board of Commissioners caused a thorough examination to be made last winter into this important matter in order that the best possible means might be devised and adopted for supplying the Home with a sufficient quantity of water for ordinary use and an adequate supply for the protection of the valuable buildings in case of fire.

After fully considering plans carefully prepared for the purpose the District Commissioners were applied to, and they readily granted permission for the Home to take 25,000 gallons of water per day, and a greater quantity in case of fire, by connecting a 6-inch water main with the city main at the junction of Whitney avenue and Seventh street extended. The Board therefore decided to adopt the plans prepared, as they embodied the best and most permanent means for procuring the required supply, and ordered that a water tower carrying an iron tank of about 50,000 gallons capacity be erected on the high ground immediately west of the Scott building, and 6-inch water mains be laid from Seventh street extended along Whitney avenue to the existing pumping station in the Home grounds, and from there to the water tower and the hospital. Also, that certain repairs be made in the pump house; that a new duplex pump suitable for the purpose required be purchased, and that fire plugs be placed near all the buildings and rising pipes with hose in the interior of the hospital in which there were none. The estimated cost of the whole improvement was given at $28,985, and received the approval of the Secretary of War. Work was therefore commenced in March last to carry out this plan, and is now essentially completed, excepting the construction of the water tower, which will probably be finished by next month, when the new system will be in full operation. An additional supply, however, supplementing the old supply from the well and springs, was turned on from the new Seventh street connection on April 6, last, and has been in use ever since.

Additional improvements have also been made during the year by the construction of a large iron gateway and a gate lodge at the south entrance to the Home grounds at a cost of $3,200; and the erection of a canopy over the fan house at the hospital at a cost of $1,069, for the convenience of the convalescent sick, for whom it affords an excellent place of outdoor shelter.

All the above-mentioned improvements were made by contract, for which awards were made to the lowest bidders for the various kinds of work required.

The act of Congress approved January 16, 1891, requiring the treasurer of the Home to keep current funds on deposit in the United States Treasury has been strictly complied with, and all supplies for the Home that could be conveniently purchased under contract were so obtained.

The treasurer's statement of accounts with the farm, the dairy, and the garden show that the value of the products of the farm equaled the expenses of the same; that there is a balance to the credit of the dairy account of $839.95, and that the products of the garden, in which

is included the expense of ornamentation of the grounds, equaled the outlay.

Regular meetings have been held by the Board for the transaction of the business pertaining to the Home and the regular monthly inspections have been made as required by law.

The following changes occurred during the year in the Board of Commissioners and the officers of the Home:

Brig. Gen. Beekman DuBarry, commissary-general of subsistence, retired December 4, 1892; was succeeded by Brig. Gen. John P. Hawkins, December 22, 1892.

Brig. Gen. Charles Sutherland, surgeon-general, retired May 29, 1893; was succeeded by Brig.-Gen. George M. Sternberg May 30, 1893.

Brig. Gen. John C. Kelton, U. S. Army (retired), governor of the Home, died July 15, 1893, and Brig. Gen. David S. Stanley, U. S. Army (retired), was appointed by the President to succeed him on September 8, and entered upon his duties as governor on September 13, 1893.

Under an opinion given by the Attorney-General, the Acting Judge-Advocate-General of the Army (Col. G. Norman Lieber) became a member of the Board of Commissioners November 12, 1892.

The sanitary condition of the Home has been excellent throughout the year and there has been no prevalent or epidemic disease among the inmates.

Good discipline, without undue restrictions, has been maintained and the inmates have been supplied with wholesome, well-prepared food, comfortable clothing, and excellent quarters, with bathing facilities sufficient to insure bodily cleanliness.

There is a good library at the Home, containing about 6,000 volumes, and daily and weekly newspapers and monthly magazines are provided, also billiard tables and various kinds of games, affording pleasant pastime to those who desire to avail themselves of the library and amusement room.

The accompanying papers are reports by the governor, the attending surgeon, and the treasurer of the Home; a statement of receipts and expenditures; statements of the permanent fund and the interest thereon; statements of accounts with the pension money of inmate pensioners, and their rates of pension; the debit and credit accounts with the farm, the garden, and the dairy; all of which are required to be published for distribution to the Army, as directed by the section and act mentioned in the first paragraph of this report.

Very respectfully,

J. M. SCHOFIELD,
Major-General Commanding the Army,
President Board of Commissioners.

The SECRETARY OF WAR.

REPORT OF THE GOVERNOR OF THE SOLDIERS' HOME.

GOVERNOR'S OFFICE, UNITED STATES SOLDIERS' HOME,
Washington, D. C., October 17, 1893.

I have the honor to submit my report for the year ending September 30, 1893. I took command of the Home the 13th of September, and thus my experience is very limited. I have, however, examined all the buildings, including the hospital, all of which I have found in good repair and clean, the hospital wonderfully so. The bedding of the men neat and free from vermin, the food good and neatly served, the system of police reliable.

The amusement of the men well provided for so far as reading, billiards, and small games are concerned. The bathing facilities are somewhat defective, yet they are sufficient to insure bodily cleanliness, bathing being compulsory.

The system of purchasing supplies seems to me satisfactory and sufficiently guarded, as all purchases are made on requisitions approved by the governor. Purchases are by contract to the lowest bidder, after due notice to the leading dealers in the articles required. All supplies delivered are required to be inspected by the governor or deputy governor, and all subsistence is turned over to the deputy governor or the surgeon in charge, and these officers are held responsible for the quantity and quality of the stores they receive.

The excessive drought of the present year will account for the poor showing of the farm; the acreage of potatoes was small compared to former years, and the yield was low for what was planted. The credits for hay should be limited to the cost of harvesting the hay. I recommend the continuance of the farm mostly for the freshness of the produce and the employment it affords the members of the Home.

The extermination of the cattle herd from pleuro-pneumonia was a great calamity to the Home, and I recommend the renewal of the herd at an early date, and as a fine herd is an essential feature in a beautiful landscape, I recommend that the best Ayrshires or Devons be bought for the new herd, as these breeds combine usefulness and beauty.

The connection of the water supply with the city waterworks, and the early completion of the stand pipe, will give a feeling of security against fires and many improvements in living not heretofore felt at this Home.

A reference to the table of alterations since last annual report will show a decrease of temporary inmates for the year of 136, but an increase of regular inmates for the same period of 27; the aggregate is 109 less than for last year. Whether this decrease will continue, or whether it is owing to exceptional causes can not yet be determined. Many deserving, some almost distressing cases, must be turned away, and in this connection, and as a matter of plain justice and policy, I recommend that every pensioner receiving $10 turn in $2 to the Home, those receiving $12 turn in $4, $12.50 turn in $4.50, those receiving $14 turn in $6, those receiving $16 turn in $8, and thence upward; every pensioner receiving more than $16 turn in to the Home $8, thus covering nearly the cost of their living in the Home. There are now in the Home 244 of these above classes, and the saving to the Home would be for the current month $1,658.50. This amount would relieve many needy cases, or supply useful and instructive things now desirable for the Home.

Now, since that water is abundant, I recommend the establishment of a good laundry. A workshop with tools of various trades would be an excellent thing, and would relieve the Home from the charge of idleness. It strikes a newcomer that this Home is rather a melancholy place, and anything tending to relieve this seems to me to be in the right direction. For this purpose the band should be improved even if it be necessary to hire two or three good musicians. Pictures of moderate cost, and in the line of the soldiers' taste, should be bought in large numbers; orchestral concerts by our own band should be encouraged by improving the band and using it daily in open air and hall; also inexpensive performances should be paid for when practical.

Of irregularities caused by the abuse of liquors I have seen none, but am informed they do exist. I have nothing to suggest at this time, but no doubt we can learn something beneficial from the experience of the National Volunteer Soldiers' Homes.

The following is the tabular statement of alterations since last annual report dated September 30, 1892:

SCHEDULE OF ADMISSIONS TO THE HOME.

Permanent beneficiaries, September 30, 1892		980
Admitted during the year		173
Readmitted during the year		171
Total		1,324
Dropped:		
By withdrawal	153	
For absence without leave	24	
Dismissed	20	
Abandoned the Home	2	
Dropped by order	55	
Died	54	
From outdoor relief	9	
		317
Permanent beneficiaries September 30, 1893		1,007

Temporary inmates:		
Present September 30,1892	209	
Admitted during the year	339	
Total temporary beneficiaries	548	
Transfered to permanent rolls	204	
Dropped	241	
Dismissed	20	
Died	10	
	475	
Remaining temporary inmates		73
Total beneficiaries		1,080

Of whom 710 are inmates of the Home, 299 receive outdoor relief, 18 are in the insane asylum, 45 are on furlough, and 8 are suspended.

Decrease of temporary inmates for the year, 136; increase of regular inmates for the year, 27. The aggregate is 109 less than was shown on last report.

Of the 64 deaths reported 14 died on outdoor relief, 34 died in Home hospital, 4 died in insane asylum, 7 died in Washington, D. C., 1 died in his quarters at the Home, 1 died on Home grounds, 2 were found drowned in Home lake, and 1 was accidentally killed by cars at Trenton, N. J. Daily average number of inmates during the year, 751¼.

TRANSIENTS.

During the year 3,720 meals have been furnished to destitute ex-volunteer soldiers, and 176 have been provided with lodgings for a few nights each.

Statement of army service.

Length of service.	Number of men.	Length of service.	Number of men.	Length of service.	Number of men.
Four months	1	Nine years	23	Twenty-three years	40
Six months	1	Ten years	10	Twenty-four years	26
Seven months	2	Eleven years	15	Twenty-five years	20
Nine months	3	Twelve years	16	Twenty-six years	17
Ten months	5	Thirteen years	24	Twenty-seven years	9
Eleven months	1	Fourteen years	20	Twenty-nine years	2
One year	37	Fifteen years	12	Thirty years	2
Two years	33	Sixteen years	19	Thirty-one years	2
Three years	31	Seventeen years	5	Thirty-three years	1
Four years	10	Eighteen years	25	Thirty-four years	1
Five years	33	Nineteen years	32		
Six years	13	Twenty years	92	Total	714
Seven years	13	Twenty-one years	70		
Eight years	13	Twenty-two years	35		

Pensions.

Rate.	Number of men.	Rate.	Number of men.	Rate.	Number of men.	Rate.	Number of men.
$2	2	$12	185	$17	68	$25	4
$4	17	$12.50	1	$18	2	$30	9
$6	31	$14	39	$20	4	$36	1
$8	109	$15	2	$22	1		
$10	47	$16	30	$24	32	Total	584

Respectfully submitted.

D S. STANLEY,
Brigadier-General, U. S. Army, Governor.

The BOARD OF COMMISSIONERS,
UNITED STATES SOLDIERS' HOME.

REPORT OF THE ATTENDING SURGEON UNITED STATES SOLDIERS' HOME.

UNITED STATES SOLDIERS' HOME,
OFFICE OF ATTENDING SURGEON,
Washington, D. C., September 30, 1893.

SIR: I have the honor to submit the following report of the medical department of the Home for the past year ending September 30, 1893.

	1893.	1892.	1891.	1890.
Patients remaining in hospital from last report	86	88	75	65
Patients admitted to hospital during the year	316	391	379	352
Total treated in the hospital	402	479	454	417
Returned to the Home, recovered, mostly acute cases	156	198	194	159
Returned to the Home, improved, mostly chronic cases	102	127	120	124
Returned to the Home unimproved, incurable	16	18	6	10
Sent to the United States Hospital for the Insane	5	5	5	6
Deserted from the hospital	0	0	3	4
Died in hospital	35	38	37	37
Dead when brought to hospital	3	7	1	2
Remaining in hospital at present date	85	86	88	75
Total	402	479	454	417

Ages of patients admitted.

	1893.	1892.	1891.	1890.
Between 20 and 30 years	32	30	37	38
Between 30 and 40 years	44	60	53	55
Between 40 and 50 years	77	83	84	72
Between 50 and 60 years	68	92	110	78
Between 60 and 70 years	60	83	69	76
Between 70 and 80 years	33	40	21	26
Between 80 and 90 years	2	3	4	6
Between 90 and 100 years	0	0	1	1
Age of the youngest ..... years	22	23	19	21
Age of the oldest ..... do	88	84	93	93
Average age of patients admitted ..... do	50.22	51.36	50.40	50.65
Greatest number of patients at one time	88	88	90	80
Least number of patients at one time	72	65	56	61
Daily average of patients in hospital	81.42	78.10	73.04	72.30

Diseases for which patients were admitted to hospital.

Disease.	Patients.	Disease.	Patients.
Abscess:		Balanitis	1
Alveolar	1	Blephoritis marginalis	1
Perineal	2	Brain clot	1
Of leg	1	Brain, tumor of	1
Of bowels	1	Bronchitis:	
Of liver	1	Acute	1
Of tonsil	1	Chronic	8
Adenitis	2	Bright's disease	3
Agraphia and aphasia	1	Bursitis	1
Alcoholism:		Carcinoma of—	
Acute	19	Face	2
Chronic	11	Liver	1
Amputation of—		Eyelid	1
Both legs, old	1	Carbuncle	1
Finger	1	Catarrh, chronic:	
Toe	1	Bronchial	5
Angina pectoris	1	Gastric	3
Aneurism of aorta	2	Renal	1
Asthma, chronic	8	Vesicle	2
Atrophy, progressive muscular	1	Cellulitis of hand	1

Diseases for which patients were admitted to hospital—Continued.

Disease.	Patients.	Disease.	Patients.
Chancre	1	Laryngitis, acute	1
Chancroids	1	Locomotor ataxy	3
Cholera morbus	4	Lumbago	1
Cirrhosis of liver	5	Malingering	1
Congestion:		Ménière's disease	1
Cerebral	1	Morphinism	4
Pulmonary	2	Neuralgia	2
Consolidation of lung	3	Ophthalmia, chronic	1
Constipation, acute	3	Orchitis	2
Contusion of—		Tubercular	1
Face	1	Otitis, external	1
Tibia	1	Pain in left hip joint	1
Contraction, palmar fascia, "Dupuytren"	1	Paralysis	4
Cystitis, chronic	1	Agitans	2
Debility:		Chronic bulbar	2
Senile	13	Paresis	1
General	2	Pleurisy:	
Delirium tremens	1	Subacute	1
Dementia	2	Chronic	1
Diabetes:		Pneumonia:	
Insipidus	1	Acute, double	1
Mellitus	3	Chronic	7
Diarrhea:		Polipi, nasal	1
Acute	14	Poisoning:	
Chronic	1	By rhus toxicodendron	2
Dislocation of humerus	1	By bite of insect	1
Drowned	2	Narcotic	1
Dysentery, chronic	1	Pruritus ani	1
Epilepsy	6	Rheumatism:	
Empyema	2	Subacute	10
Erysipelas	1	Chronic	28
Febricula	2	Sarcoma of arm	1
Fever:		Scabies	1
Continued, malarial	1	Sclerosis:	
Gastric	1	Cerebro spinal	1
Intermittent	7	Spinal	2
Remittent	1	Spleen, enlargement of	1
Typhoid	2	Sprain of—	
Fistula in ano	1	Ankle	1
Fracture of—		Arm	1
Fibula	1	Foot	1
Frontal bone, old	1	Leg	1
Kidney	1	Side	1
Leg, old	1	Stricture of—	
Skull, old	1	Esophagus	1
Gonorrhea, acute	10	Urethra	5
Hallucinations	1	Urethra traumatic	1
Hæmatoma of groin	1	Syphilis, tertiary	3
Heart disease	20	Tenia, solium	1
Hemiplegia	9	Tonsilitis	4
Hemorrhoids	4	Trichiasis	1
Hemorrhage:		Tuberculosis, pulmonary	28
Into conjunctivæ	1	Tumor, intraocular	1
Traumatic	1	Ulcer of—	
Hepatitis, chronic	2	Head, specific	1
Hernia, reduction of	1	Heel	1
Herpes zoster	1	Leg	8
Hypochondriasis	2	Urine, retention of	1
Indigestion:		Urethra, laceration of	1
Acute	5	Urticaria, acute	1
Chronic	1	Veins, varicose	1
Insanity	4	Wounds, incised, of foot	1
Jaundice	1	Awaiting diagnosis	2

This list exhibits only the diseases complained of by the patients at the time of admission to the hospital, and does not include the numerous complications nor secondary affections arising during the course of treatment. The principal troubles are chronic rheumatism, heart disease, consumption, hernia, catarrh, epilepsy, dyspepsia, and constipation. Many of the men are affected with two or more of these diseases at the same time, and yet may be admitted to hospital for some minor complaint not connected with either.

The 2,321 cases treated at sick call are not included in the above list of diseases.

Necrology.

Name.	Age.	Nativity.	Last served in company and regiment.	Died.	Cause of death.
				1892.	
Brosnan, Richard	75	Ireland	E, 1st Inf	Sept. 30	Continued malarial fever.
Healy, Daniel*	49	United States.	D, 5th Art	Oct. 8	Congestion of brain.
Buch, Frederick	50	Germany	D, 5th Cav	Nov. 16	Abscess of liver.
Palmer, William L	65	United States.	D, 2d Art	Nov. 18	Bright's disease.
Hannon, Bartholomew	59	Ireland	I, 2d Art	Nov. 19	Heart disease.
Morris, James	78	....do	General service	Dec. 27	Paralysis.
Brown, John	59	Switzerland	I, 2d Art	Dec. 29	Spinal paralysis.
				1893.	
Ohlson, Peter	39	Germany	G, 5th Art	Jan. 2	Locomotor ataxy.
Bennet, John O	72	United States.	C, 7th Inf	Jan. 3	Tumor of brain.
Mack, John	63	Ireland	Ordnance	Jan. 17	Cirrhosis of liver.
O'Hern, Michael	66	....do	F, 3d Cav	Jan. 19	Abscess of bowels.
Walsh, James	33	United States.	C, 10th Inf	Jan. 26	Consumption.
Farraher, John	64	Ireland	F, 13th Inf	Jan. 27	Brain clot.
Wegner, Edward	45	Germany	C, 2d Inf	Jan. 28	Accidental hemorrhage.
Devine, Bernard	65	Ireland	H, 5th Art	Feb. 1	Old age.
Ellerhorst, Henry	73	Germany	D, 2d Art	Feb. 23	Cirrhosis of liver.
Grotenfeldt, Gustav	48	Finland	K, 5th Cav	Feb. 24	Aneurism of aorta.
Lecronier, Henry H	42	Canada	L, 3d Art	Mar. 10	Consumption.
Devine, James	82	Ireland	A, 3d Art	Apr. 6	Old age.
Hasenfratz, Martin	33	Germany	D, 4th Cav	Apr. 8	Consumption.
Welch, John	59	Ireland	C, 18th Inf	Apr. 9	Paralysis.
Briese, Charles	51	Germany	D, 14th Inf	Apr. 30	Cirrhosis of liver.
Marmell, Anthony	50	England	C, 3d Art	May 3	Consumption.
Farrelley, John*	58	Ireland	D, 1st Art	May 8	Drowned in lake.
Craine, Joseph B	39	United States.	H, 7th Cav	May 10	Consumption.
Schmidt, Henry	62	Switzerland	F, 18th Inf	June 2	Double pneumonia.
Barrett, John	48	Ireland	H, 23d Inf	June 4	Consumption.
O'Brien, John	51	....do	M, 5th Cav	June 17	Do.
Mullalley, James	86	....do	B, 8th Inf	June 18	Old age.
Habermold, Louis*	71	Germany	B, 2d Inf	June 22	Drowned in lake.
Shea, John	55	Ireland	B, 7th Inf	July 6	Heart disease.
Riley, John	64	....do	D, 12th Inf	July 12	Do.
Keefe, Patrick	60	....do	E, 7th Inf	Aug. 17	Consumption.
Krauft, Samuel	65	United States.	E, 11th Inf	Sept. 3	Diabetes.
Smith, Frank	32	....do	M, 2d Art	Sept. 8	Consumption.
Schifferling, Christ	65	Germany	M, 2d Cav	Sept. 22	Congestion of lungs.
Johnson, Wm	66	United States.	G, 4th Art	Sept. 23	Cancer of liver.
Herlihey, Michael	53	Ireland	G, 5th Inf	Sept. 26	Cancer of face.

* Dead when brought to hospital.

The daily average of inmates present at the Home was: For 1889, 688; for 1890, 698; for 1891, 718; for 1892, 745; for 1893, 751.

Proportion of deaths to 100 inmates per annum.

Year.	Per cent.	Year.	Per cent.	Year.	Per cent.
1893	4.66	1891	5.15	1889	5.66
1892	5.10	1890	5.30	1888	5.76

Number of prescriptions compounded during the year	8,982
Number of applications for treatment at sick call	2,321
Number of out patients connected with the Home treated	296

Annual statement of expenses from treasurer's records.

	1893.	1892.	1891.	1890.
Average number of men, including attendants	112.42	107.60	102.54	100.55
Subsistence	$9,187.47	$8,763.33	$9,711.03	$8,324.84
Subsistence, inmates Government Insane Asylum	2,985.00	4,878.58	3,676.43	2,206.43
Cost of medicines	1,303.94	1,187.19	824.16	1,441.17
Attendants	6,330.62	6,648.46	6,182.87	4,634.00
Ice	350.10	416.78	378.19	345.97
Fuel	1,384.89	1,466 07	1,126.43	1,567.77
Gas	923.13	728.00	1,039.50	791.25
Laundry	252.81	261.69	377.14	180.13
Stationery	112:11	70.69	76.13	76.02
Spectacles	29.51	31.99	89.19	72.16
Trusses	4.75	4.00		
Coffins	334.96	334.77	229.75	409.91
Bedding	263.15	421.00		132.00
Repairs	1,915.54	3,685.94	525.75	444.11
Forage for ambulance horses	201.24	262.08	196.19	190.77
Instruments and appliances	133.81	71.10	208.40	93.69
Books	43.12	18.12	49.30	44.80
Furniture	414.42	527.73	394.43	306.72
Miscellaneous	39.71	60.32	47.85	102.88
Total	26,210.28	29,837.84	25,132.70	21,364.62
Cost per man per day ..... cents	63.87	75.97	67.15	58.21

Monthly statement of expenses of hospital from October 1, 1892, to September 30, 1893, furnished by the treasurer.

	Amount.
October, 1892.	
Subsistence	$803.69
Gas	50.00
Ice	26.95
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	17.90
Forage and hay	16.77
Horseshoeing	3.00
Coal	356.85
Tableware from Quartermaster's Department	120.64
Tableware, brushes, sweeps, etc	16.83
Materials for steward's quarters	9.05
Sash cord, paints, and oils	8.90
Blacking, brushes, matches, etc	8.32
Medical and hospital supplies	61.50
Lumber for coffins	30.00
Printing and stationery	19.30
Pay roll, extra duty	404.00
Total	2,073.70
November, 1892.	
Subsistence	782.85
Gas	77.50
Ice	34.30
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	24.49
Horseshoeing, forage, and hay	19.77
Towels, sheets, slippers, etc	196.30
Lye, matches, sapolio, etc	7.38
Pans and covered jars	2.50
Furnace for steward's quarters	75.00
Materials, repairs to gutters	21.33
Materials, repairs to plumbing	2.84
Medical and hospital supplies	482.37
Medical books	6.46
Spectacles and set letters	4.14
Case drawers and table	4.25
Freight, lock, pestle handle	2.35
Stationery	3.90

	Amount.
November, 1892—Continued.	
Pay roll, extra duty	$399.00
Total	2,266.73
December, 1892.	
Subsistence	881.45
Gas	94.00
Ice	14.60
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	17.18
Forage and hay	16.77
Horseshoeing	3.00
Printing and stationery	5.69
Mops, brushes, brooms, etc	20.05
Materials, repairs to stove	9.18
Plaster Paris and mortar	4.95
Lye, matches, sapolio, soap	5.58
Walnut file holder	32.00
Seats and backs for chairs	3.15
Red lead, plumbing repairs	.80
Lumber used in repairs	46.97
Bolts, trap and bend, plumbing	.70
Lime and freight	3.62
Trimmings for coffins	30.40
Medical books	14.02
Medical and hospital supplies	45.23
Government Asylum for Insane	1,016.43
Pay roll, extra duty	391.93
Total	2,777.70
January, 1893.	
Subsistence	828.75
Gas	135.00
Ice	14.60
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	20.21
Hay and forage	16.77
Horseshoeing	3.00

Monthly statement of expenses of hospital from October 1, 1892, to September 30, 1893, furnished by the treasurer—Continued.

	Amount.
January, 1893—Continued.	
Paints, oils, and varnish	$9.20
Coal	580.60
Material for police purposes	7.44
Ice hatchet	.55
Services of plasterer	19.20
Lumber material for coffins	102.94
Stationery	14.46
Centrifugal machine	18.00
Medical and hospital supplies	10.43
Pay roll, extra duty	398.89
Total	2,300.04
February, 1893.	
Subsistence	761.70
Gas	121.88
Ice	15.19
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	18.56
Hay and forage	16.77
Horseshoeing	3.00
Stamps and rack	5.25
Framing picture	5.00
Printing and stationery	8.25
Blacking, brushes, lye, etc	7.83
Varnish for coffins	1.50
Pipe, oil, etc., for elevator	7.30
Brick for range	5.00
Repairs to lavatories	370.85
Medical books	1.44
Spectacles	5.12
Pay roll, extra duty	408.40
Medical and hospital supplies	19.54
Total	1,902.58
March, 1893.	
Subsistence	784.21
Gas	109.00
Ice	19.31
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	22.98
Hay and forage	16.77
Coal	186.39
Stamps and pad	1.75
Materials for bed screens	10.63
Stationery	13.83
Medical and hospital supplies	43.76
Grates and brick for furnace	31.70
Dishes, etc	30.29
Matches, pomade, sapolio, etc	5.83
Set casters	.72
Varnish	1.50
Papering steward's quarters	41.35
Government Asylum for Insane	910.71
Pay roll, extra duty	399.00
Total	2,749.73
April, 1893.	
Subsistence	769.95
Gas	90.25
Ice	28.30
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	21.19
Hay and forage	16.77
Brick for pathway, steward's quarters	25.00
52 gallons kerosene oil	4.68
Faucet, pliers, screw-driver, files	3.45
Grate and bricks for range	1.92
Articles for police purposes	9.87

	Amount.
April, 1893—Continued.	
Freight	4.88
Medical and hospital supplies	34.17
Medical books	7.20
Printing and stationery	19.04
Pay roll, extra duty	399.00
Total	1,545.67
May, 1893.	
Subsistence	759.07
Gas	75.50
Ice	25.72
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	18.90
Hay and forage	16.77
Coal	65.68
Brass screw hooks and cup hooks	1.95
Tin for repairs to gutters	5.30
Articles for police purposes	6.49
Spring hinges and sash cord	.95
Materials, repairs to plumbing	3.54
Lumber for repairs	1.20
Boiler grate, fan house	7.98
Brass screws and picture frame	3.70
Freight	.38
Canopy over fan house and architect	1,106.41
Lumber and material for coffins	75.23
Stationery	5.66
Medical and hospital supplies	15.40
Spectacles	3.08
Pay roll, extra duty	423.40
Total	2,742.61
June, 1893.	
Subsistence	723.08
Gas	48.00
Ice	24.95
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	24.48
Hay and forage	16.77
Material for slop pails	1.65
Stationery	6.65
Lumber	3.78
Fans, crock, and refrigerator	14.45
Material, repairs to plumbing	1.85
Blacking, matches, lye, etc	8.24
Freight	.38
Medical books	8.00
Medical and hospital supplies	540.15
Government asylum for insane	1,057.86
Pay roll, extra duty	417.20
Total	3,017.49
July, 1893.	
Subsistence	704.09
Gas	35.75
Ice	29.56
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	20.95
Hay and forage	16.77
Coal	125.13
Repairs to chairs	5.60
100 enameled spit cups	20.00
Towels, muslin, tape, and thread	66.85
Renovating mattresses	8.58
Table ware, etc	36.15
Flanged bibbs	1.00
Porcelain slants and enamel	1.00
Blacking, brushes, soap, etc	9.59

Monthly statement of expenses of hospital from October 1, 1892, to September 30, 1893, furnished by the treasurer—Continued.

	Amount.
July, 1893—Continued.	
Medical and hospital supplies	$28.87
Lumber for coffins	39.00
Medical books	4.00
Stationery	8.38
Hypodermic syringe	2.50
Spectacles	3.37
Pay roll, extra duty	416.00
Total	1,703.14
August, 1893.	
Subsistence	705.44
Gas	33.00
Ice	53.28
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	24.45
Hay and forage	16.77
Coal	70.24
Renovating mattresses	8.82
Tin, bolts, and wire	18.85
Articles for police purposes	9.49
Stationery	4.80
Rope, one set axles	8.54
Galvanized iron, wire screens, etc	4.03
Set bricks for range	.75
Barrel lime, freight	1.35
Medical books	2.00
August, 1893—Continued.	
Medical and hospital supplies	$110.80
Spectacles	9.00
Pay roll, extra duty	418.40
Total	1,620.01
September, 1893.	
Subsistence	683.19
Gas	53.25
Ice	69.34
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Extra washing	21.52
Hay and forage	16.77
Horseshoeing, March to September	21.00
Putty, lead umber, benzine	2.10
Lumber, hinges, and screws	2.45
Sheet iron, nails, scrapers	6.65
Blacking, lye, matches, etc	6.89
Stationery	2.15
Truss	4.75
Amputating saw and set drills	6.67
Medical and hospital supplies	18.36
Material for coffins	55.89
Spectacles	4.50
Pay roll, extra duty	415.40
Total	1,510.88

The sanitary condition of the Home and grounds has remained excellent throughout the year. There has been no prevalent or epidemic disease among the inmates. The central tank for general distribution of water recommended in last year's report is now being built and will obviate the necessity for new tanks at the hospital. The water supply is abundant and good. The milk is obtained from a point so far from the Home that it deteriorates very much in transit, especially in warm weather. That received at the hospital during the past summer has been practically useless as an article in the preparation of diet for the sick. The capacity of the hospital during the past year has been quite sufficient without crowding for all the men requiring treatment there. It will be necessary for the preservation of the building to have it painted on the outside.

Very respectfully, your obedient servant,

W. H. FORWOOD,
Surgeon, U. S. Army, in Charge.

The GOVERNOR OF THE HOME.

REPORT OF THE TREASURER OF THE UNITED STATES SOLDIERS' HOME.

TREASURER'S OFFICE,
UNITED STATES SOLDIERS' HOME,
Washington, D. C., October 10, 1893.

GENERAL: I have the honor to transmit herewith the following statements and reports for the year ending September 30, 1893, viz:

Statement of receipts and expenditures of the Home fund, with recapitulation and comparative statement for previous year.

Statement of permanent fund and interest account, as shown by the warrant division, Treasury Department.

Statement of treasurer's account with the inmate pensioners.

Statement of pensioners in the Home, rates of pension, etc.

Statement of members of the Home receiving outdoor relief, rates of relief, rates of pension, etc.

Separate statements for each, of receipts and expenditures on account of the farm, garden, and dairy.

Very respectfully,

RICH'D C. PARKER,
Secretary and Treasurer.

Gen. D. S. STANLEY, U. S. ARMY,
Governor of the Home.

Annual report of receipts and expenditures on account of the United States Soldiers' Home, District of Columbia, from October 1, 1892, to September 30, 1893.

Receipts and expenditures.	1892.			1893.									Totals.
	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	
RECEIPTS.													
From the United States Treasurer, upon resolutions of the board of commissioners, approved by the Secretary of War	$12,000.00	$15,000.00	$25,000.00			$20,000.00		$20,000.00	$25,000.00		$15,000.00	$25,000.00	$157,000.00
Interest on the permanent fund	18,745.45			$18,719.02			$18,303.21			$18,626.13			74,393.81
Effects of deceased inmates, subject to the demand of legal heirs			12.25	33.18	34.22	9.45	20.30	52.65	14.06	17.92		8.63	202.66
Miscellaneous sources	90.74	238.90	485.94	50.52	60.50	370.18	90.56	233.02	344.89	117.46	68.33	1,862.68	4,013.72
Total	30,836.19	15,238.90	25,498.19	18,802.72	94.72	20,379.63	18,414.07	20,285.67	25,358.95	18,761.51	15,068.33	26,871.31	235,610.19
EXPENDITURES.													
Furniture for officers' quarters and expenses thereof	121.45	74.20	74.43	8.20	3.82	33.37	25.64	6.24	98.51	3.71			449.57
Compensation of the governor, deputy governor, treasurer, and clerk to board of commissioners	348.74	348.74	348.74	348.74	348.74	348.74	348.74	348.74	348.74	234.16	234.16	360.20	3,967.18
Transportation furnished to discharged soldiers en route to the Home		38.90	40.00	21.60	122.27		27.78			24.73	20.97	11.02	307.27
Fuel for the Home	4,796.04	1,324.22		1,942.13	1,059.87	272.66	274.58	369.90		381.44	209.64		10,630.48
Expenses of the hospital for medicines, medical stores, spectacles, false teeth, materials for coffins, etc	61.50	492.97	89.65	131.37	26.10	4.90	7.20	57.38	547.15	93.74	117.80	90.17	1,719.93
Expenses of the hospital, for mess and kitchen utensils, and all running expenses, including compensation to inmates on duty and pay of civilian employés	1,790.89	1,583.46	1,429.59	1,958.64	1,692.00	1,615.96	1,318.47	1,311.58	1,307.58	1,441.25	1,270.74	1,279.98	18,000.14
Refunded to claimants as heirs of deceased soldiers	191.05	121.81	33.89	184.82	206.36	57.14	6.80	566.13	261.13	264.29	789.41		2,682.83
Refunded to heirs of deceased inmates	251.30		2.00					6.05					259.35
Subsistence stores, including special diet and stimulants for the sick, and ice	3,183.53	3,980.28	3,846.73	4,276.78	3,821.10	4,152.37	3,446.98	3,213.64	3,861.88	3,287.30	3,391.71	3,189.79	43,652.09
Clothing for inmates	4,487.78	4,659.04		9.00	12.00		604.00	5,176.96					14,948.78
Articles for the Home bakery, except flour, salt, hops, and potatoes			1.00		1.00	6.77			24.99	15.53	26.62		84.59
Bedding for inmates, bedsteads, blankets, upholstery materials		950.91		26.47		129.84		92.39	37.84	74.19	15.96	20.42	1,346.57

Farm, garden, and dairy utensils, seeds, guano, manure, etc., cultivation of the garden, ornamentation of grounds, and pay of farm, garden, dairy, and other employés	1,822.82	1,662.87	1,561.53	1,819.60	1,498.85	1,851.56	1,685.00	1,921.79	2,321.82	2,019.09	1,705.37	1,587.82	21,458.12
Mess and kitchen utensils and all other articles, except bedding for the Home	69.08	389.16	81.90	56.15	169.80	292.04	393.20	102.51	124.55	63.90	26.85	112.60	1,881.74
Material and labor for general repairs to buildings, repair of roads and fences, purchase and repairs to harness, vehicles, and purchase of mechanical tools	1,682.39	428.77	185.28	125.85	218.25	615.75	383.42	260.36	259.85	798.25	329.54	160.29	5,448.00
Forage and medicines for Home animals, articles used in stables, straw used as bedding for inmates	141.99	205.26	233.28	190.02	216.17	180.95	342.84	230.56	182.72	153.34	137.21	124.06	2,338.40
Expenses of the library, governor's and treasurer's offices, postage stamps and post-office box rent, stationery, etc., for commissioners' office, freight, telegrams, and amusements	149.92	148.67	397.62	347.97	202.70	441.99	32.74	75.76	73.57	36.47	49.69	33.37	1,990.57
Incidental expenses, removal of night soil, rent of telephone, hack hire, advertising, traveling expenses, professional services, expenses of the Home chapel	108.00	84.00	865.69	264.41	183.90	159.65	76.90	67.00	155.00	83.00	65.00	161.00	2,273.55
Religious services	155.00	167.50	200.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	190.00	2,232.50
Laundry work for the Home	677.68	682.98	675.01	677.15	671.86	648.86	625.11	614.83	594.55	313.14	314.21	317.33	6,812.71
Compensation to inmates on duty at the Home and monthly allowance to inmates non-pensioners	1,715.13	1,717.50	1,654.20	1,655.90	1,636.73	1,682.32	1,756.70	1,790.87	1,763.17	1,715.91	1,723.71	1,711.31	20,523.45
Commutation to members of the Home residing outside	343.00	364.00	5,941.27	342.53	343.33	6,002.20	431.33	384.80	5,821.73	508.00	320.00	5,418.00	26,220.19
Gas for the Home, including rental of Amicks' improved gas regulators	215.25	278.25	313.25	326.00	313.50	291.00	201.25	195.00	131.50	114.25	139.00	195.00	2,713.25
Board and medical treatment of members of the Home in the Government Hospital for the Insane	.....	.....	1,016.43	.....	.....	910.71	.....	.....	1,057.86	.....	.....	1,055.00	4,040.00
Funeral expenses of members of the Home residing outside	.....	.....	.....	.....	25.00	.....	.....	.....	23.10	.....	25.00	.....	73.10
New buildings	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Permanent improvements, new fences, wells, repairs of bridges, lamp-posts, gas lamps, etc., paving, sewerage, etc.	.....	.....	.....	.....	.....	1,520.56	5,486.59	1,344.11	2,179.28	1,262.25	6,681.25	7,214.00	25,688.04
Purchase of animals	.....	.....	.....	.....	.....	125.00	.....	.....	400.00	.....	.....	.....	525.00
Total	22,312.54	19,702.79	18,991.59	14,903.33	12,963.35	21,533.54	17,665.27	18,326.71	21,766.52	13,077.88	17,783.84	23,240.04	222,267.40

RECAPITULATION.

RECEIPTS.

Balance on hand September 30, 1892	$2,164.36
From the United States Treasurer upon resolution of the board of commissioners, approved by the Secretary of War	157,000.00
From interest on the permanent fund	74,393.81
From effects of deceased soldiers, subject to the demand of legal heirs	202.66
From miscellaneous sources	4,013.72
Total	237,774.55

EXPENDITURES.

Furniture for officers' quarters and expenses thereof	$449.57
Compensation of the governor, deputy governor, treasurer, and clerk to the board of commissioners	3,967.18
Transportation furnished to discharged soldiers en route to the Home	307.27
Fuel for the Home	10,630.48
Expenses of the hospital for medicines and medical stores, spectacles, false teeth, materials for coffins, etc.	1,719.93
Expenses of the hospital, for mess and kitchen utensils, and all running expenses, including compensation to inmates on duty and pay of civilian employés	18,000.14
Refunded to claimants as heirs of deceased soldiers, etc.	2,682.83
Refunded to claimants as heirs of deceased inmates	259.35
Clothing for inmates	14,948.78
Subsistence stores, including special diet and stimulants for the sick, and ice	43,652.09
Articles for the Home bakery, repairs, etc., except flour, salt, hops, and potatoes	84.59
Bedding for inmates, bedsteads, blankets, upholstery materials, etc.	1,346.57
Farm, garden, and dairy utensils, seeds, guano, manure, etc., cultivation of garden, ornamentation of grounds, pay of farm, garden, dairy, and other employés	21,458.12
Mess and kitchen utensils and other articles, except bedding for the Home	1,881.74
Material and labor for general repairs to buildings and repair of roads and fences, purchase and repair to harness, vehicles, and purchase of mechanical tools	5,448.00
Forage and medicines for Home animals, articles used in stables, straw used as bedding for inmates	2,338.40
Expenses of the library, governor's and treasurer's offices, postage, post-office box rent, stationery, etc., for commissioner's office, freight, telegrams, and amusements	1,990.57
Incidental expenses, removal of night soil, rental of telephone, hack hire, advertising, traveling expenses, professional services, expenses of the Home chapel	2,273.55
Religious services	2,232.50
Laundry work for the Home	6,812.71
Compensation to inmates on duty at the Home, including monthly allowance to inmates nonpensioners	20,523.45
Commutation to members of the Home residing outside	26,220.19
Gas for the Home, including rental of Amick's improved gas regulators	2,713.25
Board and medical treatment of members of the Home in Government Insane Asylum	4,040.00
New buildings, payments on water tower, pipe, and laying water mains, boiler for new water supply, cost of gate and gate lodge at First street entrance Home grounds, and canopy over fan house	22,597.57
Permanent improvements, new fences, wells, repair of bridges, lamp-posts, gas lamps, etc., cemented and wooden floors in Scott building, enlargement dumb-waiters, etc	3,090.47
Purchase of animals	525.00
Funeral expenses of members of the Home residing outside	73.10
Balance on hand September 30, 1893	15,507.15
Total	237,774.55

Comparative statement of money received and disbursed on account of the United States Soldiers' Home, Washington, D. C., for two years, October 1, 1891, to September 30, 1893.

Received October 1, 1891, to September 30, 1892	$189,282.47
Expended October 1, 1891, to September 30, 1892	196,653.43
Balance on hand September 30, 1892	2,164.36
Received October 1, 1892, to September 30, 1893	235,610.19
Expended October 1, 1892, to September 30, 1893	222,267.40
Balance on hand September 30, 1893	15,507.15
Expenditures during the year ending September 30, 1892, for new buildings and permanent improvements	244.55
Running expenses for the year	196,408.88
Expenditures during the year ending September 30, 1893, for new buildings and permanent improvements	25,688.04
Running expenses for the year	196,579.36
Average cost per man per year	217.04
Average cost per man per month	18.08⅓
Average number of inmates for the year ending September 30, 1893	751
Average cost of ration per man per month, including milk, vegetables, and fruit raised on the Home grounds	$6.19
Average cost of ration per day	.20½

Statement of the Soldiers' Home permanent-fund account for October 1, 1892, to September 30, 1893.

CR.

1892.			
Oct. 1.	Balance		$2,489,940.81
Nov. 26.	Amount of deposits	$10,206.91	
Dec. 29.	Amount of deposits	3,913.70	
1893.			
Jan. 28.	Amount of deposits	31,232.00	
Feb. 25.	Amount of deposits	5,157.67	
Mar. 28.	Amount of deposits	25,481.98	
Apr. 26.	Amount of deposits	5,966.36	
May 27.	Amount of deposits	12,721.05	
June 28.	Amount of deposits	11,907.31	
July 27.	Amount of deposits	26,485.68	
Sept. 27.	Amount of deposits	13,329.85	
			146,402.51
	Total		2,636,343.32

DR.

1892.			
Oct. 20.	Less amount paid from permanent fund	12,000.00	
Nov. 22.	Less amount paid from permanent fund	15,000.00	
Dec. 20.	Less amount paid from permanent fund	25,000.00	
1893.			
Mar. 23.	Less amount paid from permanent fund	20,000.00	
May 18.	Less amount paid from permanent fund	20,000.00	
June 19.	Less amount paid from permanent fund	25,000.00	
Aug. 21.	Less amount paid from permanent fund	15,000.00	
Sept. 21.	Less amount paid from permanent fund	25,000.00	
			157,000.00
Sept. 30.	Balance		2,479,343.32
	Total		2,636,343.32

Statement of the Soldiers' Home interest account from October 1, 1892, to September 30, 1893.

DR.

Balance October 1, 1892			$18,745.51
Interest on balance, $2,489,940.81, from October 1 to December 31, 1892		$18,823.95	
Interest on deposits:			
November 26 to December 31, 1892		30.21	
December 29 to December 31, 1892		.96	
			18,855.12
Interest on balance, $2,452,061.42, from January 1 to March 31, 1893		18,132.99	
Interest on deposits:			
January 28 to March 31, 1893		161.78	
February 25 to March 31, 1893		14.82	
March 28 to March 31, 1893		8.41	
			18,318.00
Interest on balance, $2,493,933.07, April 1 to June 30, 1893		18,654.61	
Interest on deposits:			
April 26 to June 30, 1893		32.37	
May 27 to June 30, 1893		36.57	
June 28 to June 30, 1893		2.91	
			18,726.46
Interest on balance, $2,479,527.79, July 1 to September 30, 1893		18,745.23	
Interest on deposits:			
July 27 to September 30, 1893		143.68	
September 27 to September 30, 1893		5.47	
			18,894.38
Total			93,539.45

CR.

Less interest on principal paid:			
Fourth quarter of 1892		136.10	
First quarter of 1893		14.79	
Second quarter of 1893		100.33	
Third quarter of 1893		71.09	
			322.31
Less interest paid:			
Fourth quarter of 1892		18,745.45	
First quarter of 1893		18,719.02	
Second quarter of 1893		18,303.21	
Third quarter of 1893		18,626.13	
			74,393.81
Balance			18,823.29
Total			93,539.41

Treasurer of the United States Soldiers' Home in account with the inmate pensioners, for moneys received under section 4, act approved March 3, 1883, and deposited with the Treasurer of the United States.

1892.		MONEYS RECEIVED.	
Oct.	1.	Balance on hand	$49,443.15
Oct.	31.	S. L. Willson's checks	1,095.45
Nov.	30.	S. L. Willson's checks	1,229.19
Dec.	31.	S. L. Willson's checks	22,239.42
1893.			
Jan.	31.	S. L. Willson's checks	2,399.20
Feb.	28.	S. L. Willson's checks	1,018.97
Mar.	31.	S. L. Willson's checks	24,168.03
Apr.	30.	S. L. Willson's checks	1,431.00
May	31.	S. L. Willson's checks	557.90
June	30.	S. L. Willson's checks	20,763.17
July	31.	S. L. Willson's checks	1,170.20
Sept.	30.	S. L. Willson's checks	20,214.94
		Total	145,730.62

1892.		MONEYS DISBURSED.	
Oct.	10.	Heirs of Michael Manning	226.00
	10.	George Maier, pensioner	20.00
	10.	James Clark, pensioner	151.00
	17.	John Hoschett, pensioner	168.00
	17.	Estate of William A. Marshall, deceased	57.00
	28.	John Pranke, pensioner	24.00
	31.	Pension pay roll for October, 1892	2,460.71
Nov.	30.	Pension pay roll for November, 1892	1,008.80
Dec.	5.	The estate of George W. Odell, deceased	200.00
	15.	William E. Tompkinson, pensioner	12.00
	31.	Pension pay roll for December, 1892	19,679.58
1893.			
Jan.	31.	Pension pay roll for January, 1893	2,608.26
	31.	Estate of Frederick Buck, deceased	105.00
Feb.	6.	Estate of Henry Martin, deceased	42.00
	28.	Pension pay roll for Febuary, 1893	683.96
Mar.	6.	James Clark, pensioner	70.00
	28.	James Sullivan, pensioner	73.00
	31.	Pension pay roll for March, 1893	23,056.17
Apr.	22.	James Clark, pensioner	329.00
	27.	James H. May, pensioner	6.00
	30.	Pension pay roll for April, 1893	3,487.94
May	11.	Estate of Edward Wegner, deceased	348.00
	22.	Estate of John Welch, pensioner	26.00
	31.	Pension pay roll for May, 1893	1,502.10
June	10.	Estate of Richard Brosenham	154.00
	30.	Pension pay roll for June, 1893	13,761.13
July	31.	Pension pay roll for July, 1893	5,211.15
Aug.	12.	Estate of John Ward, deceased	860.00
	30.	Estate of Henry Schmidt, deceased	145.00
	31.	Pension pay roll for August, 1893	4,558.00
	31.	Refunded on account of estate of John Barrett, deceased	42.00
Sept.	11.	John Engleright, pensioner	36.00
	12.	Julius Fuerst, pensioner	26.00
	28.	Robert Stewart, pensioner	66.00
	30.	Pension pay roll for September, 1893	13,398.91
	30.	Amount transferred to the Home fund under section 4, act approved Mar. 3, 1883	1,312.57
	30.	Balance in United States Treasury	49,815.34
		Total	145,730.62

Annual report of the number of pensioners in the United States Soldiers' Home, rates of pension, etc., September 30, 1893.

Pensioners drawing—		Pensioners drawing—	
$2	8	$18	3
4	42	20	6
6	62	22	2
8	197	24	39
10	52	25	6
12	231	30	14
12.50	1	36	2
14	43	72	1
15	3		
16	37		834
17	85		

Pensioners present in the Home:		
Pensioners whose money is drawn by the treasurer	561	
Pensioners who have assigned their certificates	30	
		591
Pensioners absent:		
On outdoor relief	195	
On furlough	33	
On suspension	6	
In Government Hospital for the Insane	9	
		243
Total number of pensioners September 30, 1893		834
Total number of pensioners September 30, 1892		825

Alterations since last report, September 30, 1892:		
New certificates received for inmates	58	
Admitted and readmitted	276	
		334
Loss by discharge	280	
Loss by death	45	
		325
Net gain during the year		9
Description of certificates:		
Army invalid		567
Army, act of June 27, 1890		121
Mexican war		142
Navy, original		2
Navy, act of June 27, 1890		2
		834

Annual report of members of the United States Soldiers' Home receiving outdoor relief September 30, 1893; rates of relief, pensions, etc.

Receiving outdoor relief per month of—	
$8	244
6	6
4	25
2	24
Total	299
Number September 30, 1892	328
Net loss during the year	29
Nonpensioners receiving outdoor relief	104
Receiving pensions per month of—	
$2	6
4	24
6	24
8	80
10	3
12	32
14	2
Receiving pensions, continued—	
16	3
17	9
18	1
20	2
22	1
24	3
25	1
30	3
72	1
Total nonpensioners	104
Total pensioners	195
	299
Mexican war survivors	110
Men who have served 25 years or over	46
Nonpensioners of latter class	13

Fourteen members of the Home on outdoor relief have died since date of last report Twenty-five members were dropped from outdoor relief after June 30, 1893, in compliance with resolutions of the Board of Commissioners June 19, 1891, and July 15, 1893

Farm account, United States Soldiers' Home, October 1, 1892, to September 30, 1893, consolidated.

	Quantity.	Value.		Quantity.	Value.
DR.			CR.		
To labor, forage, fuel, fertilizers, implements, seeds, and repairs		$6,000.83	By onions, bunches	8,029	$80.29
balance to credit of farm		582.37	parsley, do	2,364	100.80
			parsnips, bushels	218	193.75
Total		6,583.20	peppers, bunch	1	.05
			peas, bushels	56½	28.25
CR.			pepper, red, do	½	.25
			potatoes, white, do	1,591½	1,190.28
By asparagus, bunches	304	24.32	potatoes, sweet, do	144½	88.52
beets, bushels	814½	458.62	radishes, do	7½	7.50
beans, string, do	56½	33.75	rhubarb, bunches	1,610	40.25
cabbage, heads	10,567	380.85	spinach, bushels	68⅓	30.45
cantaloupes	171	10.26	squash, do	27	8.10
carrots, bushels	276⅓	190.03	squash, tons	10	200.00
ears corn, green, dozens	787	100.10	squash, pounds	1,240	18.60
horse radish, pounds	2,000	80.00	tomatoes, bushels	408½	171.48
kale, bushels	166⅓	49.95	watermelons	174	11.95
lettuce, heads	4,809	96.18	hay, tons	175	2,975.00
okra, bushels	7½	13.62	Total		6,583.20

Estimate of vegetables in ground on United States Soldiers' Home farm September 30, 1893.

Beets, 700 bushels, at 75 cents	$525.00	Salsify, 125 bushels, at $1	$125.00
Cabbages, 3,000 heads, at 3 cents	90.00	Spinach, 100 bushels, at 50 cents	50.00
Carrots, 125 bushels, at $1	125.00	Winter squash, 4 tons, at $20	80.00
Celery, 8,500 stalks, at 5 cents	425.00	Turnips, 200 bushels, at 50 cents	100.00
Parsley, 3,000 bunches, at 4 cents	120.00		
Parsnips, 250 bushels, at $1	250.00	Total	1,987.50
Sweet potatoes, 150 bushels, at 65 cents	97.50		

Garden account of United States Soldiers' Home, from October 1, 1892, to September 30, 1893, consolidated.

	Quantity.	Value.
DR.		
To labor, fertilizers, seeds, tools, fuel, and implements		$4,330.84
CR.		
By cherries ..... quarts	181	5.43
grapes ..... pounds	594	17.82
pears ..... bushels	67½	67.50
plants, trees, and shrubs raised in greenhouse ..... plants	23,772	2,528.00
cords of wood	80	400.00
balance to debit of garden expended in improvements of grounds		1,312.09
		4,330.84

NOTE—This department has the care of the ornamentation of the grounds, lawns, flowers, shrubs, trees, and fruit.

Dairy accounts United States Soldiers' Home, from October 1, 1892, to September 30, 1893, consolidated.

DR.

To labor, forage, tools, fuel and repairs	$4,626.46
loss by slaughter of 47 cows	1,880.00
loss by slaughter of 3 bulls	135.00
loss by slaughter of 11 heifers	165.00
Total	6,806.46

CR.

By 15,654 gallons milk	4,367.85
sale 25 calves	138.00
service of bulls	10.00
20,330 pounds of beef from slaughtered (dairy) cattle	1,069.24
826 loads of manure to Home farm	289.10
sale of hides	92.32
Balance to debit of dairy	839.95
Total	6,806.46

NOTE.—No charge is made for grazing of stock on the farm.

REPORT OF BOARD OF VISITORS TO WEST POINT MILITARY ACADEMY.

BOARD OF VISITORS.

JUNE, 1893.

APPOINTED BY THE PRESIDENT OF THE UNITED STATES.

1. Hon. CHARLES S. FAIRCHILD ..... NEW YORK, N. Y.
2. Hon. HENRY L. PIERCE ..... BOSTON, MASS.
3. Hon. FRANK THOMSON ..... PHILADELPHIA, PA.
4. Gen. A. C. McCLURG ..... CHICAGO, ILL.
5. Rev. JOHN W. DINSMORE ..... SAN JOSE, CAL.
6. Prof. EDWIN A. ALDERMAN ..... GREENSBORO, N. C.
7. Hon. JOHN P. REA ..... MINNEAPOLIS, MINN.

APPOINTED BY THE PRESIDENT OF THE SENATE.

8. Hon. S. M. CULLOM ..... SPRINGFIELD, ILL.
9. Hon. E. D. WHITE ..... NEW ORLEANS, LA.

APPOINTED BY THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

10. Hon. JOSEPH WHEELER ..... WHEELER, ALA.
11. Hon. JAMES S. GORMAN ..... CHELSEA, MICH.
12. Hon. HENRY H. BINGHAM ..... PHILADELPHIA, PA.

REPORT

OF THE

BOARD OF VISITORS

TO THE

UNITED STATES MILITARY ACADEMY

FOR THE YEAR 1893.

To the Secretary of War, the President of the Senate, and the Speaker of the House of Representatives:

The following report of the Board of Visitors to the United States Military Academy at West Point for the year 1893 is respectfully submitted.

The Board of Visitors was appointed in accordance with the provisions of the Revised Statutes of the United States, sections 1327, 1328, and 1329. These Statutes contain the authority for the appointment of the Board, the purpose for which it is appointed, and the nature and scope of its duties.

NAMES OF THE BOARD OF VISITORS.

In accordance with these provisions of the law relating thereto, the following gentlemen were appointed and requested to convene at the Military Academy on or before June 1, 1893:

APPOINTED BY THE PRESIDENT OF THE UNITED STATES.

1. Hon. CHARLES S. FAIRCHILD ..... New York, N. Y.
2. Hon. HENRY L. PIERCE ..... Boston, Mass.
3. Hon. FRANK THOMSON ..... Philadelphia, Pa.
4. Gen. A. C. MCCLURG ..... Chicago, Ill.
5. Rev. JOHN W. DINSMORE ..... San Jose, Cal.
6. Prof. EDWIN A. ALDERMAN ..... Greensboro, N. C.
7. Hon. JOHN P. REA ..... Minneapolis, Minn.

APPOINTED BY THE PRESIDENT OF THE SENATE.

8. Hon. S. M. CULLOM ..... Springfield, Ill.
9. Hon. E. D. WHITE ..... New Orleans, La.

APPOINTED BY THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

10. Hon. JOSEPH WHEELER ..... Wheeler, Ala.
11. Hon. JAMES S. GORMAN ..... Chelsea, Mich.
12. Hon. HENRY H. BINGHAM ..... Philadelphia, Pa.

ORGANIZATION.

A meeting was called in the Board rooms at the West Point Hotel on Thursday afternoon, June 1, at 3:30 o'clock.

A quorum of the Board of Visitors being present, the Board was organized by the unanimous selection of Hon. Shelby M. Cullom as president, Hon. Charles S. Fairchild as vice-president, and Prof. Edwin A. Alderman as secretary.

The secretary was instructed to notify Col. O. H. Ernst, superintendent of the Military Academy, of the organization of the Board. This was done, and in reply the following letter was received:

HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., June 1, 1893.

SIR: I have the honor to acknowledge the receipt of your communication of this date notifying me of the organization of the Board of Visitors.

I shall be happy to afford the Board every facility for a thorough inspection of the workings of all the departments of the Academy, administrative as well as those of instruction, and in general to do everything possible to assist the Board in its labors.

A programme of the examination has already been furnished each member. Notice will be given from day to day of such military exercises as are ordered for the Board of Visitors.

First Lieuts. Alexander B. Dyer, Fourth Artillery; Wilds P. Richardson, Eighth Infantry; John C. W. Brooks, Fourth Artillery, and Willard A. Holbrook, Seventh Cavalry, have been detailed to attend upon the Board of Visitors during their stay at the Academy.

I also take occasion to say that I hope the Board will communicate with me freely, both personally and officially, upon any subject connected with the Military Academy which may be of interest to its members in connection with their official visit to West Point.

In conclusion, permit me to say that I desire to call officially upon the Board of Visitors at the hotel at 4:15 o'clock p. m. to-day, with the members of the Academic Board and my military staff, for the purpose of paying our respects to the Board of Visitors, and to conduct them to a review of the Corps of Cadets given in their honor.

At the close of the review it will give me pleasure to receive the members of the Board, their families, and friends at my quarters, to meet the officers and ladies of the Post and prominent citizens residing in this vicinity.

Very respectfully, your obedient servant,

O. H. ERNST,
Colonel of Engineers, Superintendent.

Hon. S. M. CULLOM,
President Board of Visitors, West Point, N. Y.

The Secretary then read the following order:

Orders, No. 77.] HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., June 1, 1893.

[Extract.]

* * * * * * *

II. In honor of the arrival at the Post of the Board of Visitors a salute of seventeen guns will be fired at 4:25 o'clock p. m. to-day, under the direction of the commanding officer, U. S. Military Academy Detachment of Ordnance.

III. The Battalion of Cadets will be reviewed by the Board of Visitors at 4:30 o'clock p. m. to-day.

* * * * * * *

By order of Col. Ernst:

J. M. CARSON, JR.,
First Lieutenant Fifth Cavalry, Adjutant.

Before adjournment each member of the Board was put in possession of a copy of the following:

ORDER OF EXAMINATIONS AND MILITARY EXERCISES.

Orders, No. 66.] HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., May 15, 1893.

I. The Annual Examination will begin on Thursday, the 1st proximo, and continue daily, Sundays excepted, from 9 o'clock a. m., till 1 o'clock p. m., and from 2:30 o'clock p. m., till 4:30 o'clock p. m., until finished.

II. The Academic Board will be divided into two committees:

The first committee will be composed of the professor of natural and experimental philosophy; the professor of mathematics; the professor of civil and military engineering; the professor of law; and the instructor of practical military engineering.

The second committee will be composed of the professor of drawing; the professor of chemistry, mineralogy, and geology; the professor of history, geography, and ethics; the commandant of cadets; the professor of modern languages; and the instructor of ordnance and gunnery.

The first committee will sit in the library and examine, orally, (1) the first class in engineering; (2) the third class in mathematics; (3) the first class in law; (4) the second class in philosophy; by inspection of marks and practical work, (5) the first class in practical military engineering; and by written examination the fourth class in mathematics, at 8 a. m., June 1.

The second committee will sit in the lecture room of the philosophical academy and examine, orally, (1) the second class in chemistry, mineralogy, and geology; (2) the fourth class in French; (3) the third class in French; (4) the first class in Spanish; (5) the first class in ordnance and gunnery; by written examination, the third class in French, at 8 a. m., June 1; the first class in Spanish, at 2 p. m., June 2; the fourth class in English, at 8 a. m., June 5; the fourth class in French, at 8 a. m., June 6; and by inspection of marks and drawings, the second and third classes in drawing.

In all the classes the oral examinations will begin with the lowest sections, and the examinations will be so conducted as not to interfere with the usual hours for meals of cadets.

All written examinations will be conducted in Grant Hall.

On June 1 the upper floor of the addition to the cadet quartermaster's department store will also, if found necessary, be used for the written examinations.

The examination of the first class in practical military engineering will be conducted in Fort Clinton.

The Superintendent will preside in either committee in which he may be present.

III. As each committee shall complete its labors of examination, its presiding officer will report the fact to these headquarters.

Either committee may in its discretion extend its labors not to exceed one hour each day, provided this does not interfere with any of the military exercises directed in Par. VI of this order.

IV. First Lieut. George F. Barney, Second Artillery, and First Lieut. Cecil Stewart, Fourth Cavalry, are appointed the secretaries of the first and second committees respectively. The record of each committee will be so kept as to show clearly the length of time occupied in examination by each department of instruction.

At the close of each day's proceedings the secretaries will report to the adjutant of the Academy the progress of the examination, and they will transmit to the secretary of the Academic Board the records of the proceedings of the committees as soon as they are completed.

V. The instructors will report daily to the heads of their respective departments and keep themselves informed as to the times when their services will be required.

VI. The following military exercises will take place during the examination:

Infantry.—Escort of the colors and review, June 1; school of the battalion, June 8; company competition drill, a. m.; drill in extended order, p. m., June 9.

Artillery.—Heavy artillery drill (seacoast guns), June 2; school of the battery (field artillery), June 7; heavy artillery drill (siege mortars), 8 p. m., June 9.

Cavalry.—School of the troop, June 3; school of the trooper, June 6.

Practical military engineering.—Military bridge construction (pontoon bridge), June 5.

Small arms.—Use of the sword and bayonet, military gymnastics, 8 p. m., June 7.

This order of exercises may be changed on account of the weather, or for other causes.

VII. The members of the first class will be graduated June 12, 1893.

By order of Col. Ernst:

J. M. CARSON, Jr.,
First Lieutenant Fifth Cavalry, Adjutant.

Official:

J. M. CARSON, Jr.,
First Lieutenant Fifth Cavalry, Adjutant.

WORKING COMMITTEES APPOINTED.

At the second session of the Board the president announced the committees as follows:

Appointments and examinations.—Messrs. Fairchild, Thomson, and Wheeler.

Discipline and instruction.—Messrs. Wheeler, Alderman, and Dinsmore.

Armament and equipment.—Messrs. Rea, White, and Bingham.

Buildings, grounds, and lights.—Messrs. Gorman, Pierce, and McClurg.

Supplies and expenditures.—Messrs. Dinsmore, Thomson, and Pierce.

Fiscal affairs.—Messrs. McClurg, Thomson, and Fairchild.

Miscellaneous affairs.—Messrs. Alderman, White, and Cullom.

The hour of 2:30 p. m. was fixed upon as the time for the daily meeting of the Board. The Hon. Henry H. Bingham was prevented from attending by serious illness.

Hon. James S. Gorman reported on June 2, and assumed his duties as a member of the Board.

The Board practically completed its labors on Saturday, June 10, and Messrs. Cullom, Pierce, McClurg, and Gorman were called away on that day.

PLAN OF PROCEDURE BY THE COMMITTEES AND THE BOARD.

Preparatory to individual committee work, the Board as a body made a tour of inspection of the entire Academy, examining the grounds, buildings, equipment, and attending several section rooms where the annual examinations were being held. The secretary was instructed to invite Col. O. H. Ernst, Superintendent of the Academy, to appear before the Board to present and discuss any of the needs of the institution that might seem to him desirable. In compliance with this request Col. Ernst appeared before the Board and discussed for an hour the affairs of the Academy. In addition he sent a letter indicating explicitly to the various committees the best sources of information available to them. Every facility was thus afforded for a thorough examination of the Academy and its workings, and the officers in charge were eager and prompt to aid the committees in their investigations. It can not be said that West Point or any other educational institution is perfect, but it may be said with simple truth that the men who administer the affairs of the Military Academy, academic, military, and administrative, are entirely faithful, capable, and conscientious. There is to be seen here none of the cant and sham of education. Everything is mercilessly genuine.

The committees addressed themselves to their work with eagerness, interest, and constancy. Nine daily sessions of the Board were held, at which the results of the labors of the respective committees, their recommendations and conclusions, were discussed, and their formal reports, which are to follow in this report, were analyzed and adopted by vote of the entire Board.

The Board was requested by the Superintendent to select one of its members to deliver an address to the graduating class on June 12. The Hon. Charles S. Fairchild, of New York, was chosen unanimously for this honor.

The secretary, by instruction of the Board, forwarded to the Secretary of War two resolutions. One urged the early completion of the academic building, and begged that no further time be allowed the contractors. The other begged that the corps of cadets be permitted to visit the World's Columbian Exposition at Chicago.

The Board attended daily some form of military exercise by the cadets in infantry, artillery, cavalry, and practical military engineering.

These exercises were remarkable exhibitions of efficiency and skill, and are scarcely susceptible of criticism. The foundation of much of the endurance and soldierly power of the cadets is laid in their gymnastic training.

The Board witnessed the exhibition of the work done with the members of the fourth class in the gymnasium; and were strongly impressed with its scientific character and with the remarkable results achieved.

In conclusion, it may be said that while the Board of Visitorsre cognized the rigorous genuineness and effectiveness of the intellectual training given at West Point, they also saw with even greater satisfaction that the education of the Military Academy appreciated and sympathized with the great truth that, after all, character is greater than intellect.

The young men there gathered together, representing all sections and all phases of American life, gave plain and beautiful evidence day by day of large manliness and deep-seated courtesy, of great patriotic fervor, and of firm and loyal adherence to truth and honor.

After the presentation and adoption of all the reports, the Board finally adjourned on Saturday night, June 10.

APPOINTMENTS AND EXAMINATIONS.

Committee on appointments and examinations.—Messrs. CHARLES S. FAIRCHILD, FRANK THOMSON, and JOSEPH WHEELER.

The committee on examinations and appointments reports that the individual members have attended many of the examinations, and that they were impressed with the accuracy of knowledge which the cadets showed therein; the work done was strong testimony to the thoroughness of the instructors' work as well as to the diligence of the students.

The only suggestion which the committee wishes to make in this regard is that the cadets should be taught to enunciate their words more clearly and distinctly; where all else is so clear and exact a thick and blurred utterance is all the more marked.

The committee wishes to renew the recommendations of previous Boards of Visitors that the requirements for admission be raised and that the number of cadets be gradually increased. We regard it as a pity that the largest possible number of youth should not share the advantages of the admirable plant, education, and training which West Point affords. It is also a pity that the minds of the young men should not have had enough training and gained enough scope before coming here to enable them at once upon entering the Academy to begin to get the fullest benefit from the intellectual resources which are offered to them. If this were the case it seems to the committee that the intellectual life begun here would continue and go on to fuller development on the part of more Army officers than in the past.

CHAS. S. FAIRCHILD, *Chairman.*
FRANK THOMSON.
JOSEPH WHEELER.

DISCIPLINE AND INSTRUCTION.

Committee on discipline and instruction.—Messrs. JOSEPH WHEELER, EDWIN A. ALDERMAN, and JOHN W. DINSMORE.

Your committee has investigated the subjects within its province and is unable to suggest any improvement in the methods of discipline at the Military Academy.

The most able and intelligent administration of the affairs of the Military Academy by the Superintendent and staff, the commandant of cadets, and his assistants is worthy of the highest commendation.

All infractions of the rules are certainly and promptly punished with absolute justice and impartiality. The committee is pleased to observe that a very high degree of respect is entertained by the cadets toward the officers and professors, and also that these gentlemen fully reciprocate this feeling and use all proper efforts to impress young gentlemen with their confidence in them, all of which tends to increase manliness and self-respect on the part of the cadets.

Your committee is of opinion that the changes recently made and those now contemplated are all in the right direction. Their character is indicated by the following letter from the present efficient commandant of cadets:

HEADQUARTERS U. S. CORPS OF CADETS,
West Point, N. Y., June 7, 1893.

SIR: In answer to your letter of the 7th instant, just received, asking for a statement in regard to any changes or improvements contemplated in reference to the discipline of cadets, etc., I would respectfully state that these are matters of slow growth.

The present system of discipline is the result of many years' experience and effort on the part of superintendents and others charged with this duty, and although minor changes are made from time to time, the underlying principles have remained unchanged for many years. I have recently revised the interior regulations for the government of the Corps of Cadets, which has been approved by the Superintendent (copy inclosed). In this revision I have reduced the previously published prohibitions pertaining to the conduct of cadets very considerably, and in another revision contemplated during the coming year will reduce these regulations still further, the intention being to free the mind of the cadet from the idea that he must find a regulation covering every possible offense, and his failure to find a special prohibition gives him permission to commit the impropriety.

He will be taught by constant care and instruction that there are many minor offenses which as a soldier he must intuitively know can not be committed.

I should be most happy to give your committee any information, verbally or otherwise, if you will suggest to me the particular points you would like information

upon. It might be of interest to the committee to call at my office any day between 7:30 and 10 a. m., during the transaction of business with cadets, to observe the methods pursued.

Very respectfully,

S. M. MILLS,
Lieutenant-Colonel of Artillery, Commandant of Cadets.

To the SECRETARY BOARD OF VISITORS.
(Through Headquarters, U. S. Military Academy.)

The professors, assistant professors, and instructors are devoted to their duties to the cadets and to the institution, and their methods fully attain the high purposes for which the Academy was established.

The committee is of opinion that measures should be adopted to give the professors more opportunities to visit and inspect the colleges of this and, if possible, other countries, and as under the present regulations assistant professors and instructors can only remain four years at the Academy, it would be advantageous for them to spend a year at some college of note before commencing their four years' tour as instructors at the Academy. The committee wishes it to be fully understood that this recommendation is not made because it sees any defect in the system now in vogue at West Point, which it regards as excellent, but it thinks, as all the professors, except the chaplain, come from the graduates, that some such measure should be adopted to keep the Academy in touch with other institutions, and to enable it to avail itself of any improvements which from time to time may be developed.

The committee finds that between September and January 1 some ten to twenty cadets of the fourth class very generally give up their studies, but remain at the Academy until the semiannual examination. They become careless in conduct, negligent in observance of the regulations, and in a measure interfere with their classmates who are devoting themselves to their studies and duties.

It is important to reduce this evil to a minimum, and the committee recommends that measures be adopted to attain this end.

The committee has considered the subject of an extension of the course of English and history, but as the committee is informed that the Academic Board is now earnestly considering this matter the committee deems it best not to submit any definite recommendations.

In consideration of the manifest importance of these subjects to the intellectual life of the cadets, the following letter was addressed to the Academic Board:

ROOMS OF THE BOARD OF VISITORS,
West Point, N. Y., June 6, 1893.

GENTLEMEN: The subcommittee on discipline and instruction of the Board of Visitors requests a brief opinion from each of you in reference to the following matters:

1. Is it desirable to have a fuller course in history and English in this institution?
2. If so, how can this be accomplished without detriment to the established curriculum of the Academy?

I have the honor to remain, very respectfully, your obedient servant,

EDWIN A. ALDERMAN,
Secretary.

To the ACADEMIC BOARD.

In order to make clear the attitude of the academic authorities at the Academy on this subject the committee begs to incorporate in its report the following replies received from various members of the Academic Board:

WEST POINT, N. Y., *June 7, 1898.*

SIR: In reply to your communication of the 6th instant, I have to state:

(1) That, in my opinion, an improvement in the history and English courses of instruction at the Academy is very desirable.

(2) That the manner of accomplishing this without detriment to any other interest of the Academy is a question involving many considerations. It has been under advisement by a committee of the Academic Board for the past year, and the only feasible plan that I am prepared to recommend at present has been evolved by this committee. This plan may be outlined as follows:

First. To materially modify the present fourth-class English course and have is terminate at the January examination of that year.

Second. To transfer the Spanish course from the first-class year to the last term of the third-class year, the Spanish then to employ a portion of the time now given to French.

Third. The French to employ the time vacated by the English in the fourth-class year after the January examination.

Fourth. The time now given to history and Spanish in the first-class year to be given to ordnance and gunnery, except about two weeks to be given to cavalry drill regulations.

Fifth. The time now given to ordnance and gunnery to be given to history.

This is a change which has been proposed by a committee of the Academic Board and is still to be considered by the entire Board. In my opinion, this change can be introduced immediately with great advantage to the institution.

The net effect of the proposed change is to diminish the elementary English of the fourth-class year by forty recitations, and to increase the history studies of the first-class year by the same amount. This change in the English studies, taken in connection with the modification of the fourth-class course, referred to in paragraph 1 above, it is thought, will greatly improve these studies. The French will be decreased by thirty-eight recitations, and Spanish increased by eighteen; drill regulations will be increased by twelve lessons, and ordnance and gunnery by eight recitations.

Very respectfully,

S. E. TILLMAN,
Professor of Chemistry, etc., U. S. Military Academy.

The SECRETARY OF COMMITTEE ON INSTRUCTION, ETC., BOARD OF VISITORS.
(Through Headquarters, U. S. Military Academy.)

U. S. MILITARY ACADEMY,
West Point, N. Y., June 8, 1898.

SIR: In reply to your letter of inquiry as to the advisability of increasing the courses of English and history at the Military Academy, I have the honor to say:

That if the question were simply whether it would be advisable, provided there was time now available for this purpose, my answer would be unhesitatingly in the affirmative. But this difficulty exists: The time of the cadets is now so fully occupied that something already in the curriculum must be dropped and the studies depending on it rearranged before any new subject can be introduced or any enlargement be made in either of the courses referred to in your letter.

The Academic Board has been considering the very subject of the proper modification of these courses, and a committee of its members had already sent in a report after making an exhaustive study of the matter.

The consideration of the whole question will doubtless be made immediately after the examination now in progress, and the result will be submitted to the Secretary of War for his action.

Very respectfully, your obedient servant,

P. S. MICHIE,
Professor of Philosophy.

Prof. E. A. ALDERMAN,
Secretary of the Board of Visitors.
(Through the adjutant, U. S. Military Academy.)

U. S. MILITARY ACADEMY,
West Point, N. Y., June 7, 1893.

GENTLEMEN: I have the honor to submit the following answers to the questions contained in your letter of the 5th instant, viz:

(1) "Is it desirable to have more history and English in the course of instruction?"

In my opinion, a modification of the courses of instruction in history and English with a moderate increase of the time allowed for history is desirable.

(2) "If so, how can this be done without detriment to the institution?"

The possibility of readjusting the different courses of instruction so as to admit of the introduction of a longer course of history without detriment to the institution has been under consideration by the Academic Board during the last year, and the arrangement of necessary details has received long and careful study by a committee, which I am informed is about to make its report.

The different branches of instruction are so interlocked that any change in one necessitates a corresponding modification in so many others, that I am not prepared to outline a method of making a change at this time. Before doing so it will be necessary for me to carefully study the report of the committee which has been investigating this subject.

I remain, very respectfully, your obedient servant,

JAMES MERCUR,
Professor of Civil and Military Engineering.

The COMMITTEE OF THE BOARD OF VISITORS,
U. S. MILITARY ACADEMY, UPON DISCIPLINE AND INSTRUCTION.
(Through Headquarters, U. S. Military Academy.)

WEST POINT, N. Y., *June 7, 1893.*

GENTLEMEN: In reply to your communication of June 6, I have the honor to state:

In regard to the first question, viz: "Is it desirable to have more history and English in the course of instruction?" I would say, decidedly, "Yes."

In regard to the second question, viz: "How can this be done without detriment to the institution?" I have the honor to state that this is a practical and very difficult question, as anyone who has had to do with the rearrangement of courses of studies in an educational institution will readily recognize.

It is a question involving a readjustment of several courses, and would, therefore, require more time for consideration than we have now to give to it. That the courses in English and history here could be greatly improved I have no doubt.

However, for the present, a committee of the Academic Board now has under consideration a request from me for sixty additional lessons in history, which, if granted,

will be, in my judgment, a great improvement to the course, without increasing the working hours of the cadets.

This committee has also certain propositions for the improvement of the course in English under advisement.

I have the honor to remain, most respectfully, your obedient servant,

W. M. POSTLETHWAITE,
Professor History, Geography, and Ethics.

The COMMITTEE ON DISCIPLINE AND INSTRUCTION OF THE BOARD OF VISITORS,
(Through Headquarters, U. S. Military Academy.)

DEPARTMENT OF DRAWING, U. S. MILITARY ACADEMY,
West Point, N. Y., June 7, 1893.

SIR: In reply to the interrogatories of your circular regarding the subjects of history and English, I have the honor to say:

(1) I am in favor of an extension of the course in history for the reason that neither the requirements of entrance nor the present course of study in that branch insure a reasonable familiarity with the rudiments of the subject, and because, so far as I am able to ascertain, no technical institution, civil or military, of the grade of this Academy, either here or in Europe, requires so low a grade of liberal development in its graduates. I conceive a fair knowledge of the framework of universal history to be indispensable to a proper understanding of the political and social development of this country and of the world, and the necessary medium of intelligent contact with the vital interests of the day and of the future.

(2) I do not favor the extension of the course of elementary English here, but favor the increase of the standard of admission in that subject to cover much that is now taught in the department of modern languages. I should be glad to see in its place a course in the higher branches of English, including English literature.

(3) For the present I think the most judicious arrangement that proposed in the report of a committee of the Academic Board appointed to consider these subjects and now awaiting action.

Very respectfully, your obedient servant,

CHARLES W. LARNED,
Professor of Drawing.

Prof. E. A. ALDERMAN,
Committee of Discipline and Instruction.

WEST POINT, N. Y., *June 8, 1893.*

SIR: In reply to the question asked by your committee—

(1) "Is it desirable to have more history and English in the course of instruction?"

(2) "If so, how can it be done without detriment to the institution?"

I have the honor to say:

1. I think it is desirable to have more history in the course of instruction, but that it is not necessary to add directly to the English course.

2. I think this can be done without detriment to the institution, as follows:

(*a*) By transferring Spanish from first-class year to the last term of third-class year.

(*b*) Allowing third-class French to be finished in time for this Spanish.

(*c*) Allowing English to be finished in less time than at present.

(*d*) Slightly modifying the English course so that it will lose some of the elementary character it now has, and hence accomplish more than it now does in less time.

(*e*) Giving to ordnance and gunnery the time now occupied by Spanish and history in first-class year, with the exception of that necessary for a few lessons in drill regulations.

(f) Giving to history the time now occupied by ordnance and gunnery.

This plan is essentially the same as that already submitted by a committee of the Academic Board, and at present under consideration.

It makes, in my judgment, a very judicious distribution of the time, without increasing the studies of cadets, and without interfering improperly with any department of instruction.

The study of history is itself indirectly a study of English, and is hence a valuable addition to the course taught in fourth-class year.

Very respectfully, your obedient servant,

LAWRENCE L. BRUFF,
Captain Ordnance Department, U. S. Army,
Instructor of Ordnance and Gunnery.

Prof. E. A. ALDERMAN,
Secretary of Committee, Board of Visitors.
(Through Headquarters, U. S. Military Academy.)

In conclusion the committee can not too highly express its appreciation of the ability and devotion displayed by the heads of the various departments.

JOSEPH WHEELER, *Chairman.*
EDWIN A. ALDERMAN.
JOHN W. DINSMORE.

ARMAMENT AND EQUIPMENT.

Committee on Armament and Equipment.—Messrs. JOHN P. REA, E. D. WHITE, and HENRY H. BINGHAM.

The committee on armament and equipment respectfully submits the following report:

The committee made as careful and thorough examination of the matters falling within the scope of its duty as the limited time allowed permitted.

The arms and equipments of the cadet corps and of the soldiers stationed at this post were found in most excellent condition.

The cavalry and light artillery arms of the service are under very efficient instructors.

The work in these two arms, however, is greatly embarrassed by the fact that the same horses are used in both.

Fifty good cavalry horses should be supplied to be used exclusively by the cadet corps in the riding school and for cavalry drill.

Twenty-eight privates of the cavalry detachment are required to act as drivers of the field artillery when on drill, and also to care for the artillery harness. This extra duty compels them to provide themselves with additional clothing at their own expense. They must have both cavalry and artillery uniforms. These men have thus imposed upon them not only extra duty but extra expense. They should receive as additional pay at least $6 per month for the period (about five months of the year) in which they do such extra work. This would cost the Government $840 per year.

Such allowance would stimulate the men in their work, would aid in securing first-class drivers for the battery, and promote a higher state of discipline and instruction.

The Military Academy band, which now consists of 24 enlisted musicians and a leader, should be increased to at least 40 members and a leader. It is a good band, well trained and equipped, and handsomely uniformed, but it can never become what it should be as the leading military band of the nation without a large increase of members.

The committee would also recommend that the band leader, who is a civilian, be given the rank and pay of a second lieutenant, to enable him the more efficiently to discharge his duties.

A large portion of the heavy guns at this post are old, unsafe, and of types useless in modern warfare. Your committee would join in the recommendations made by previous boards that this post be supplied

with new heavy ordnance of all classes and of the best types and most improved patterns, properly mounted, and that subcaliber tubes be furnished for the heavier guns for use in target practice.

We also recommend that the Military Academy be furnished with models of the latest improvements in ordnance as fast as they can be obtained, in order that the cadet corps may be made familiar with their mechanical details and use.

In view of the importance of the ordnance department in modern warfare, and of the great responsibility resting upon the officer in charge of it at the Military Academy, we would recommend that there be placed at the head of this department a professor of ordnance and artillery, with the rank and pay of lieutenant-colonel.

The following communication, received from Capt. L. L. Bruff, instructor of ordnance and gunnery at the Military Academy, in response to inquiry made of him, is submitted as a part of this report; the recommendations therein are in accord with the views of the committee, and are commended to the Board for approval.

Respectfully submitted.

JOHN P. REA,
Chairman Committee.

STATEMENT OF CAPT. L. L. BRUFF.

WEST POINT, N. Y., *June 6, 1893.*

SIR: I have the honor to submit, for the information of your committee, the following statement with reference to the present armament of the post and that proposed:

The present armament is as follows:

In the seacoast battery.—One 15-inch Rodman gun, mounted on center-pintle carriage with pneumatic buffers; one 15-inch Rodman gun, mounted on front-pintle carriage with hydraulic buffers; three 8-inch converted rifles on modern carriages; one 10-inch Rodman smoothbore gun on old carriage; one 300-pound Parrott rifle on old carriage; one 13-inch smoothbore mortar on old carriage.

In Battery Knox.—One 100-pound Parrott rifle on old carriage; one 300-pound Parrott rifle on old carriage; four 10-inch Rodman smoothbore guns on old carriages.

In siege battery.—Six 4.5-inch cast-iron rifled siege guns mounted on wooden carriages. These guns are not used except for drill purposes Six 10-inch smoothbore mortars mounted on iron mortar beds.

In field battery.—Two batteries, six pieces each, of 3.20-inch steel B. L. rifles, with limbers and caissons complete.

Machine and rapid-fire guns.—One Gatling gun, caliber .45 inch, model 1883; one Gatling gun, caliber .45 inch, model 1875; one Gardiner machine gun; one Hotchkiss revolving cannon; one Hotchkiss rapid-fire gun; one Hotchkiss mountain gun.

PROPOSED ARMAMENT.

It is proposed to mount in the seacoast battery, as soon as carriages for them can be manufactured, one 8-inch steel B. L. rifle, one 12-inch B. L. rifled mortar, two 8-inch converted rifles (on front-pintle carriages), the latter to replace the old 10-inch smoothbore Rodman and the 300-pound Parrott, now no longer used; in the siege battery, four 5-inch steel B. L. siege guns (on steel carriages), two 7-inch steel B. L. howitzers (on steel carriages),

No changes are proposed in Battery Knox, as it is not used except occasionally for saluting.

The field batteries are complete, and the only addition to them required is four 3.6-inch steel B. L. rifled mortars.

With reference to the proposed armament, it may be stated that it is doubtful if modern high-power guns can be fired at this post without danger to the neighboring towns and the railroad, and hence it is proposed to retain some of the older guns, which can be safely fired, to give cadets the necessary firing practice.

These guns are still in service, and therefore the time spent on them in instruction is not wasted, while one 8-inch gun and one 12-inch mortar will render cadets familiar with our modern guns and their carriages.

All these guns have been asked for, and will be furnished by the Chief of Ordnance as soon as completed. The 12-inch mortar is already here, and the 8-inch gun can be delivered at any time as soon as the carriages are ready.

The siege guns and howitzers are not yet ready for issue, as questions with reference to their carriages are not settled; but it is believed to be only a question of a short time before they will be ready, and the siege armament will be modern and complete.

With reference to the siege mortars the same may be said—they will be furnished as soon as they can be completed.

It has been the policy of the Department here, with the concurrence of the Superintendent, to ask annually for an appropriation for the purchase of a modern machine or rapid-fire gun of an approved type, which shall serve for the instruction of cadets in the principles of these guns, which now occupy so prominent a place before the public.

Under this plan a Hotchkiss rapid-fire gun has been purchased and delivered. A Maxim automatic machine gun, ordered and now in process of construction, and a Maxim or Nordenfelt rapid-fire gun will be purchased in the present fiscal year. It is respectfully recommended that this plan be continued, and that the purchase of a Driggs-Schroeder rapid-fire gun be purchased for next year.

In addition to this, the Academy should have a sample of each of the magazine small arms with which the different countries of Europe are armed.

These are necessary for purposes of instruction, and are also valuable additions to the museum of the Military Academy, which should contain a complete collection of all such arms.

Indirectly connected with the subject of armament is the subject of models of the different service guns and carriages. Nothing is more valuable for the instruction of cadets than good working models of the subject studied. By their use the laborious study of descriptions of the guns and carriages is avoided, and, furthermore, since it is generally impossible for the cadet to have the gun and carriage before him in the recitation room, it is important that he should have a model of them, so that he can actually see and explain its workings.

Formerly the department of ordnance and gunnery was well provided with models of all service guns and carriages, but these are now obsolete, and no new ones have been obtained.

I would respectfully recommend that the sum of $3,000 be appropriated for this purpose next year.

They will also be valuable acquisitions to the museum of the Military Academy.

I would also call attention in this connection to the fact that in the new academic building, now being erected, a large room has been set apart for an ordnance museum. There is a large collection of valuable material already on hand for this museum, consisting of guns, trophy flags, models, regimental colors, swords, etc. These must be properly arranged in cases and stands, and the room properly fitted up for its purpose. If this is done, there are undoubtedly many more such things that will be sent to be added to the collection as soon as it is found that they can be

properly exhibited and taken care of. For this reason I would respectfully recommend that an appropriation be made for this purpose. Its amount can not be definitely stated at present, as the sum that can be expended next year will depend on the condition of the building.

Respectfully submitted.

LAWRENCE L. BRUFF,
Captain, Ordnance Department, U. S. Army,
Instructor of Ordnance and Gunnery.

Gen. JOHN P. REA,
Chairman of Committee on Armament, etc.

BUILDINGS, GROUNDS, AND LIGHTS.

Committee on buildings, grounds, and lights.—Messrs. JAMES S. GORMAN, H. L. PIERCE, and A. C. MCCLURG.

Your committee on buildings, grounds, and lights reports that the buildings in use are in very good condition, excepting quarters for married enlisted men. Your committee very earnestly recommends that these quarters be torn down and rebuilt. Of these buildings there are nine sets, two families in each set, being old wooden single-story buildings, in a poor state of preservation, and so situated that during the wet seasons of the year they, in a measure, act as a catch-basin for the surface water coming down the bluff.

Your committee wishes to call attention to the cavalry barracks and stable and cadets' riding hall, being the only other buildings in need of improvement and repair. We recommend that the porch on the south side and east end of these barracks, as was designed in the original specifications, should now be built, the cost of which will no doubt be submitted by the Superintendent.

We also recommend that $2,000 be appropriated, in addition to the $450 already appropriated by the Fifty-second Congress, second session, to paint the exterior of the stable and whitewash the interior of the same, and also whitewash the interior of the cadets' riding hall.

The interior walls of the latter building were whitewashed many years ago, and it is now chipping off, making the building look very dilapidated, and the ceiling has never been either whitewashed or painted, giving to the hall a dark and gloomy appearance. If whitewashed, it is expected that it will give better light and look more cheerful and be in better keeping with the other buildings on the grounds. The exterior of the stable was painted with some poor material about fourteen years ago, and is now nearly half off.

The new academic building, for which Congress appropriated $490,000, was let by contract to E. L. Pennock & Bros., of Philadelphia, Pa., for $449,000, work to commence June 15, 1891 (but it did not commence until two weeks later), the south wing to be completed and ready for use December 1, 1892, and the entire building completed and ready for use August 1, 1893. Failing to complete the building according to contract, application was made and the time for completion of the entire building was extended to December 1, 1893. From the calculation made by Lieut. Kuhn, the Government engineer in charge, taking as a basis the progress already made and the fact that the contractors are now and have for some time been working only six masons, at least one

year more extension will be necessary to complete the building. The old academic building being torn down necessarily incurs much inconvenience to both the professors and cadets for lack of the necessary room for the classes. In this extension of time the early completion of the south wing seems to have been lost sight of. It seems to the committee that this is very important, and that the contractors should be urged to do all that is possible to complete the south wing at a much earlier date than the completion of the whole building on December 1 of the present year.

Your committee feels justified in recommending that no further extension of time for completion be granted under any circumstances, and that the penalty clause in the contract be enforced to the letter of the law.

The new gas plant, for which Congress appropriated $48,250, was let to J. J. Kennedy, of Linwood, Pa., for $41,993. The specifications for this contract include new building for retort house and shop, and holder with a capacity of 55,000 cubic feet, which, with the two small holders now in use with a capacity of 34,000 cubic feet, will make a total capacity in the three holders of 90,000 cubic feet. With this volume of gas all the objectionable features to the present lighting will be obviated. By this same contract the old plant is to be entirely overhauled and remodeled, making practically an entirely new gas plant, with all the modern improvements. There is also to be built by this contract a lime storehouse, boiler house, and governor and meter house. This contract is to be completed August 22, 1893, and no doubt will be finished by that date. The contract for extra plumbing was let for $1,100, and will be completed by September 1 next. Improved gas chandeliers have been contracted for at a total cost of $2,080, to be placed in cadet barracks. The total of these contracts will make a saving on the appropriation for improved lighting of $3,077.

Your committee recommends an appropriation of $40,000 for the remodeling of the interior of the old library building, with a special view of making it fireproof. There are about 34,000 volumes in this library, some of which are very old and of much value, and we specially urge that immediate steps be taken to protect them, and also to make the interior present an appearance in keeping with the surrounding buildings.

Your committee also recommends the building of one set of officers' quarters, at a cost not to exceed $7,500.

All of which is respectfully submitted.

JAS. S. GORMAN, *Chairman.*
H. L. PIERCE.
A. C. MCCLURG.

SUPPLIES AND EXPENDITURES.

Committee on supplies and expenditures.—Messrs. JOHN W. DINSMORE, FRANK THOMSON, and H. L. PIERCE.

The committee on supplies and expenditures for cadets, having attended to the duty assigned them, offers the following report:

We made particular examination of the laundry, the store, the arrangements for boarding the cadets, and such other departments of the Academy as it was our duty to inspect.

We found the laundry to be very complete in all its appointments and its management all that could be desired. The cadets are charged a uniform price for the work done, and this is fixed as nearly as possible at such a figure as will make the laundry self-sustaining.

We were much interested in the methods employed in conducting the store for furnishing supplies to cadets. This store contains a large assortment of clothing, stationery, and similar articles of convenience or necessity, all of which are purchased in large quantities and on the lowest terms, and are supplied to cadets at such a price as merely covers the cost of purchase and handling. The volume of business is about $65,000 annually. This store is undoubtedly a great convenience to the cadets, and it seems to us to be managed in an admirable manner.

The mess hall, kitchen, and other departments connected with the subsistence of the cadet corps have been carefully inspected by the committee.

We find that the food supplied to the cadets is entirely satisfactory in respect of variety, quantity, and quality, and that the arrangements for storing, preparing, and serving it are all that could be desired.

There is, however, one thing connected with this department of which we wish to speak with emphasis. It is the urgent need of a new floor in the mess hall. The present floor is of wood, and in order to keep it clean it must be very frequently washed with water and soap. In consequence, it is constantly damp—indeed, thoroughly soaked—and emits an odor which is not only very disagreeable, but, as we believe, unwholesome.

Such a condition of things would not be endured in the dining room of any good hotel or boarding house in the country. We are, therefore, very decided and earnest in our opinion that this floor should be removed as soon as possible, and that a pavement of stone or black and white tile should be put in its place.

The estimated cost of this improvement is about $4,000.

We regard this as very important alike to the health and comfort of the cadets and the credit of the United States.

We can not refrain from commending in the strongest terms the very efficient administration of the affairs of his department by Maj. W. F. Spurgin, treasurer, quartermaster, and commissary, battalion of cadets, whose great courtesy to the committee is also gratefully acknowledged.

JOHN W. DINSMORE, *Chairman.*
FRANK THOMSON.
H. L. PIERCE.

FISCAL AFFAIRS.

Committee on fiscal affairs.—Messrs. A. C. McGlurg, Frank Thomson, and Charles S. Fairchild.

The committee on fiscal affairs has examined as carefully as the limited time at its disposal would permit the books and accounts kept by Capt. W. H. Miller, the quartermaster and disbursing officer of the post, and Maj. W. F. Spurgin, treasurer of the Military Academy and quartermaster and commissary of cadets, and, judging from the examination which it has been able to make, it has nothing but commendation for the system and carefulness with which the records and accounts of these officers are kept.

It is manifest, of course, that a committee with little previous knowledge of such books and accounts could in the short time at its command do little more than examine the system upon which these accounts are kept, and could not test the ultimate accuracy and correctness of its results, but it could discover nothing which did not seem to indicate the utmost care and conscientiousness on the part of the officers in charge.

The system of accounts kept in these departments, and especially the multiplicity of detail which is necessary in the office of the quartermaster and commissary of cadets, has been so fully and so frequently explained in many of the reports of previous Boards of Visitors that a repetition would seem to be entirely superfluous.

After pretty minute examination into these maters the committee finds nothing new to suggest. It has discovered no opportunity and no necessity for improvement, and it feels justified in saying that it has been most favorably impressed with the seeming carefulness, accuracy, and simplicity with which all these accounts are kept, and with the painstaking and thorough manner in which the duties of these officers and their assistants are performed.

The statements of receipts and expenditures made upon various accounts in the office of Capt. Miller are shown in the accompanying papers, marked Exhibits A, B, and C, which Capt. Miller has voluntarily furnished to the committee.

As already stated, the accounts kept in the office of Maj. Spurgin are very unusual and very full of detail, inasmuch as he not only has entire charge of the mess table of the corps of cadets, and must keep its accounts, but he must also keep a detailed account with each cadet, showing the amount placed to his credit, whether from the Government

or from private sources, and all charges against him for his various and necessary expenses and supplies. These accounts, which are also recorded in a pass book kept for the information of each cadet, show at once the amount remaining to the credit of the cadet or (which occurs in very rare instances after the first year) the amount of his indebtedness to the Government.

Maj. Spurgin has now been for a number of years detailed to fill this position, and he seems to the committee not only genuinely interested in the important duties which devolve on him, but seems also peculiarly fitted by nature and by long training for the performance of these duties.

A. C. McCLURG, *Chairman.*
FRANK THOMSON.
CHAS. S. FAIRCHILD.

STATEMENT OF CAPT. MILLER.

U. S. MILITARY ACADEMY, QUARTERMASTER'S OFFICE,
West Point, N. Y., June 6, 1893.

SIR: In accordance with your request, I have the honor to inclose herewith, for the information of the Board of Visitors, abstracts pertaining to money accountability, viz:

Appropriations for the support of the U. S. Military Academy.
Special contingent fund, U. S. Military Academy.
Gas fund, U. S. Military Academy.

Very respectfully, your obedient servant,

W. H. MILLER,
Captain and Assistant Quartermaster, U. S. Army,
Disbursing Officer U. S. Military Academy.

Gen. A. C. McCLURG,
Chairman Subcommittee of Board of Visitors,
On the Fiscal Affairs of the U. S. Military Academy, West Point, N. Y.

EXHIBIT A.

Abstract of appropriations made for the support of the U. S. Military Academy, received and disbursed by Capt. W. H. Miller, assistant quartermaster, U. S. Army, disbursing officer U. S. Military Academy, during the period commencing July 1, 1892, and ending June 6, 1893.

REGULAR APPROPRIATIONS.

	Current and ordinary expenses.	Miscellaneous items and incidental expenses.	Buildings and grounds.
Fiscal year, 1891.			
On hand July 1, 1892	$3,666.42	$1,886.26	$8,571.72
Received since	172.38		
Total	3,838.80	1,886.26	8,571.72
Expended	3,838.80	1,886.26	8,571.72

Abstract of appropriations made for the support of the U. S. Military Academy, received and disbursed by Capt. W. H. Miller, etc.—Continued.

REGULAR APPROPRIATIONS—Continued.

	Current and ordinary expenses.	Miscellaneous items and incidental expenses.	Buildings and grounds.
Fiscal year, 1892.			
On hand July 1, 1892	$9,028.71	$2,458.98	$2,589.01
Received since	90.00	.....	.....
Total	9,118.71	2,458.98	2,589.01
Expended	8,142.17	2,361.40	2,589.01
Unexpended balance on hand	976.54	97.58	.....
Fiscal year, 1893.			
On hand July 1, 1892	.....	.....	.....
Received since	67,511.25	22,020.00	64,000.00
Total	67,511.25	22,020.00	64,000.00
Expended	52,348.40	18,386.70	34,882.52
Unexpended balance on hand	15,162.85	3,633.30	29,117.48
Fiscal year 1893-'94.			
Received	600.00	.....	4,150.00
Expended	.....	.....	1,017.44
Unexpended balance on hand	600.00	.....	3,132.56

SPECIAL APPROPRIATIONS.

Acts approved February 12, 1889.

	New academic building.		New gymnasium.
On hand July 1, 1892	$37,012.71	.....	$39,993.25
Received since	79,300.00	.....	.....
Total	116,312.71	.....	39,993.25
Expended	96,199.16	.....	26,991.69
Unexpended balance on hand	20,113.55	.....	13,001.56

I certify that the above abstract is correct, and that the expenditures stated have been made by me on vouchers approved by the Superintendent of the U. S. Military Academy.

W. H. MILLER,
Captain and Assistant Quartermaster, U. S. Army,
Disbursing Officer U. S. Military Academy.

WEST POINT, N. Y., *June 6, 1893.*

EXHIBIT B.

Abstract of receipts and expenditures pertaining to the U. S. Military Academy gas fund, between the 1st day of July, 1892, and June 6, 1893.

Receipts:	
Sales of coke	$564.03
Sales of coal tar	543.00
Sales of gas to officers	2,407.39
Sales of gas to civilians	708.30
Sales of gas for public buildings	456.40
Sales of gas to cadets, in barracks	1,089.76
Sales of gas fixtures to cadets	169.79
Sale of old gas pipe	43.00
Total	5,981.67
On hand July 1, 1892	143.03
	6,124.70
Expended July 1, 1892, to June 6, 1893	5,580.29
Unexpended balance on hand June 6, 1893	544.41

I certify that the above abstract is correct, and that the expenditures stated have been made by me on vouchers approved by the Superintendent of the U. S. Military Academy.

W. H. MILLER,
Captain and Assistant Quartermaster, U. S. Army,
Director of the Gas Works, U. S. Military Academy.

WEST POINT, N. Y., *June 6, 1893.*

EXHIBIT C.

Abstract of receipts and expenditures pertaining to the special contingent fund, U. S. Military Academy, between July 1, 1892, and June 8, 1893.

On hand July 1, 1892		$3,473.60
Receipts:		
By rent of West Point Hotel	$2,375.00	
Rent of post-office cottage	112.50	
Rent of public stables	81.25	
Rent of confectionery store (retiring house)	350.00	
		2,918.75
Cash received from the U. S. Military Academy gas fund for the purpose of reimbursing the special contingent fund for expenses incurred in setting up 13 clay retorts in the U. S. Military Academy gas works		648.20
Total		7,040.55
Expended, to include June 6, 1893		5,158.17
Balance on hand June 6, 1893		1,882.38

I certify that the above abstract is correct, and that the expenditures reported have all been made upon vouchers approved by the Superintendent of the U. S. Military Academy.

W. H. MILLER,
Captain and Assistant Quartermaster, U. S. Army,
Treasurer Special Contingent Fund, U. S. Military Academy.

MISCELLANEOUS AFFAIRS.

Committee on miscellaneous affairs.—Messrs. EDWIN A. ALDERMAN, E. D. WHITE, and S. M. CULLOM.

The committee on miscellaneous affairs submits the following report:

1. The committee recommends the appointment of Herman J. Koehler, master of the sword and director of the gymnasium, as first lieutenant in the Army. The development of the body is scarcely less important than the development of the mind in the training of a soldier. It is the duty of Mr. Koehler to give this training to the cadets of the Military Academy and to command for a portion of every day the largest class of cadets in the institution. He is entirely without military rank. It is believed that the conferring of this rank will largely increase his effectiveness and power as an instructor and thereby subserve the interests of the Academy.

2. Much valuable time is lost to each recurring Board of Visitors by reason of unfamiliarity with the nature of its duties and the necessary details and methods of procedure. The present board unites with some of its predecessors in recommending the reappointment each year of two or more members of the previous Board.

This recommendation is made in the sincere belief that its adoption will result in largely facilitating the transaction of business and in increasing the influence and usefulness of the Board as an inspecting and advisory body.

EDWIN A. ALDERMAN, *Chairman.*
E. D. WHITE.
S. M. CULLOM.

ABSTRACT OF RECOMMENDATIONS MADE BY THE BOARD.

1. Increase of the number of cadets.
2. Elevation of the standard of admission.
3. A fuller course in history and English.
4. Opportunity for professors and instructors to visit other institutions of learning.
5. Increase in number of horses, especially for cavalry purposes.
6. Increase of the Military Academy band from twenty-four to forty pieces.

7. Promotion of Mr. Clappé, the band leader, to second lieutenancy in the Army.
8. Establishment of full professorship in the department of ordnance and artillery.
9. The procuring of new heavy ordnance of best types.
10. Rebuilding the quarters of married enlisted men.
11. Improvement and repairing of cavalry barracks.
12. An appropriation of $2,000 for painting and whitewashing interior of stable and cadets' riding hall.
13. Early completion of the south wing of the academic building.
14. An appropriation of $40,000 for remodeling the interior of the library building, in order that the 34,000 volumes contained therein may be properly housed.
15. Provision for models of latest improvement in ordnance.
16. Extra pay to 28 privates of the cavalry detachment for extra duty required, amounting to $840 per annum.
17. An appropriation of $7,500 for building one set of officers' quarters.
18. An appropriation not to exceed $4,000 for a new floor of stone or tile in the mess hall.
19. The appointment of Mr. Koehler, director of the gymnasium, to first lieutenancy in the Army.
20. The reappointment each year of two or more members of the previous Board of Visitors.

THE GRADUATION EXERCISES.

The graduation exercises were held on the morning of June 12. Col. Ernst presided. The cadets received their diplomas at the hands of Maj. Gen. John M. Schofield, the general commanding the Army, who accompanied their delivery with a few graceful and impressive words to the young soldiers. Col. John M. Wilson was called out by Col. Ernst and spoke to the class with great power and feeling of their past life at the Academy and of the duties that awaited them.

The main address of the day was by the Hon. Mr. Fairchild. He was introduced by Col. Ernst and spoke as follows:

ADDRESS OF HON. CHARLES S. FAIRCHILD.

Gentlemen of the graduating class:

On behalf of the Board of Visitors—that body which comes here to represent the Executive and Legislative Departments of the Government of that people to whose service you have consecrated yourselves—and in pursuance of a custom more honored, perhaps, in the breach than in the observance, I greet you, and express to you the gratification which this visit has given to the Board, as a whole, and as individuals. To many of our members this Academy, while in a sense known, was yet most imperfectly known. We have been impressed with the completeness of your discipline and training, with the accuracy of knowledge which you showed in your examinations, and with the dignity of your bearing as a corps and as individual men. For inspiration you need but to hear the roll of your Academy; that roll which when

told over excites patriotic enthusiasm, and calls forth high emotion beyond that of the roll of any like institution in the world. We hope that your services will not be called for in war, and I believe they will not be needed—for this United States has grown so great in power that the nations of the world know that the issue of a conflict with her would be but one, and knowing this, every nation will wait long before measuring our strength.

The youngest of us may scarcely see an opportunity for you to gain the honors of war, but it is open to everyone of you to win the honors of peace, so beautifully described by Tennyson:

> Who grasps the skirts of happy chance,
> And breasts the blows of circumstance,
> And grapples with his evil star,
>
> And makes by force his merit known,
> And lives to clutch the golden keys,
> To mold a mighty state's decrees,
> And shape the whisper of the throne,
>
> And, moving up from high to higher,
> Becomes on Fortune's crowning slope,
> The pillar of a people's hope,
> The center of a world's desire.

Of more than one of the graduates of the West Point Academy all this may be truly said.

It has been wittily put that duties are mean, troublesome, little things, but that duty is a great and noble thing, and yet duty is made up of duties, and if you keep yourselves always equipped by doing that which comes to your hand to the best of your ability, and thereby fulfilling your duty, all that has come to any of the graduates of this Academy may come to you.

In a few years you will begin to wonder what you have left to you of all that you have learned here. Twenty years after graduating from the old University of Harvard, we had at each plate at our class dinner some of the examination papers which had been given us in college, and which we must have answered more or less well to have received our degrees at all. Not even the best of the scholars among us could then answer the questions on those papers, and to most of us they did not even suggest an idea. As for myself, at the end of my first term sophomore, I had a condition in analytical geometry, and it was necessary that I should pass an examination at the end of the vacation in order to go on with my class. Prof. (now president) Eliot was our instructor in mathematics, and when I went to him to pass my examination he at first refused to hear me because I had no certificate from a tutor that I had studied with him during the vacation. I pleaded with him for several days to try me; finally he yielded and examined me throughout all one Saturday; I passed, and then thought if I knew anything I knew analytical geometry, but now analytical geometry has all gone from my mind.

This, I think, will be your experience as to your studies here, except those which you will use in the years to come; and yet can it be true that you will have gained nothing? No; you will find yourselves far better equipped for the work of life—far better able to meet emergencies—than your fellowmen who have not had your training, and beyond all you will take away with you a something which is the product of the public opinion that exists among yourselves, and which men call by the holy name, "Honor." This will be with you all your life long, and will serve you in many a trial and temptation. All men know that when a thing is said, an account certified, or an estimate made, by one who has worn the gray uniform here, and has exchanged it for the blue, that behind and sustaining it all is the honor of an officer of the Army of the United States.

There is something else of infinite value which we carry away from these institutions, and that is our friendships. You love one another now, but as your ranks grow thinner you will cling more and more to the friends that you have made in this Academy. Remember the proverb: "A friend loveth at all times, and a brother is born for adversity." Bear this in mind when the struggle comes for promotion and advancement; never be content to receive either at the undue expense of a brother officer. If you keep yourselves always at your best, morally, intellectually, and physically, and thus ready to grasp the opportunities which will come to you duly and naturally, you will not fail of reward. Remember that all things come to him who waits and watches.

Most of you, I am bound to believe, look forward to the time when you will have homes of your own. A great soldier, one who at 32 had achieved a fame which has lasted through the centuries, sends you this message. Sir Philip Sidney said:

> Believe me, man, there is no greater blisse
> Than is the quiet joy of loving wife;
> Which, whoso wants, half of himself doth misse;
> Friend without-change, play-fellow without strife,
> Food without fulnesse, counsaile without pride,
> Is this sweet doubling of our single life.

All of this—prosperity, honor, and fireside happiness—do I, in behalf of the Board of Visitors, wish to the members of the class of 1893.

CONCLUSION.

After full investigation and deliberation the Board of Visitors adopted the reports of the several committees as the report of the Board, and in conclusion now submits some general remarks:

The U. S. Military Academy at West Point is the only military school in the United States owned by the Government. The Academy is a growth rather than a creation. Established in 1802, it received and educated very few young men for many years, the records showing that it did not graduate a student in 1810. For many years, however, beginning soon after the close of the civil war, large classes have been graduated every year, and to-day there are few young men of any military spirit who do not desire to enter the Military Academy. The laws permit the Academy to receive only a limited number—one from each Congressional district in the United States, one from each Territory, one from the District of Columbia, and ten from the country at large. The Board desires to reiterate, and if possible emphasize, the recommendation of the committee on appointments and examinations, that the number of cadets be increased, and that the standard of qualification for admission be raised. If better educational qualifications were required of young men seeking admission, there would not be so many rejections for failure after admission and many more cadets would be graduated every year.

The Board is impressed with the belief that the Academy should be required to educate as many young men as its capacity will justify. Any policy which fails to secure to the nation the full benefit of the institution in the education and training of its young men is neither economical nor wise.

The graduates of this Academy have been equal to every emergency in our national life. The pages of American history have been made luminous by the simple story of the great achievements in war and in peace of the men who were educated in this school. The young men are trained especially for the life of the soldier, to defend the honor and integrity of the nation and to protect the flag, but they are subject to be called upon also to act as conservators of the peace, and subject to the civil authorities. In this republican government the fact that the civil authority dominates should be impressed upon the minds of all young men.

The spirit and temper of the American people are hostile to a large standing army, and the Government only seeks to maintain a sufficient military establishment to perform such military duty as may from time to time be required to protect our frontier, man our forts and defenses, and generally to perform such duties as may be required of the Army in pursuance of the national Constitution. Ordinarily, in time of peace, good order must not be dependent upon the presence of troops and the use of the bayonet.

The demand of the age is to provide schools for the education of all the youth, with opportunity for the highest scientific, literary, and artistic education.

The young men sent from the Military Academy are qualified for, and, as in the past, will be expected to organize and lead armies when occasion requires; they are equipped by proper training for war; they are equipped for the duties of civil life; they are also fitted to become leaders of men in war and in peace.

The Academy, in the judgment of the Board, deserves and should receive the most cheerful and liberal support of the people and of the Government.

The Board takes occasion in this connection to say that it has been unable to discover any want of attention to duty by any officer in any capacity connected with the Academy. Each member of the Academic Board seems to be enthusiastic in the discharge of his duties; there is that mutual interest on the part of instructor and cadet so essential to good results in school.

The Board feels that words of praise are due to each and every officer connected with the Academy, whether in high or in subordinate positions. The United States as a nation has become one of the foremost nations of the earth. Its interests and position alike require that its military school should be the best and should receive generous treatment, that it may keep pace with the advance of the nation in power and prosperity. We are a united and prosperous people, yet the little Army maintained by the Government, officered by men educated at the expense of the people, should be ever ready to defend the Union.

Lincoln once said, in reviewing certain military events, that "The Father of Waters again goes unvexed to the sea." No foreign government or power must ever be allowed to vex that great river, or to molest or hinder our progress in national greatness and prosperity.

The committees of the Board have made several suggestions and ecommendations which are believed by the whole Board to be important. Some of them call for early attention, and all are worthy of the avorable consideration of the Secretary of War and of Congress.

Respectfully submitted.

S. M. CULLOM, *President.*
CHARLES S. FAIRCHILD, *Vice-President.*
E. D. WHITE.
HENRY L. PIERCE.
FRANK THOMSON.
A. C. MCCLURG.
JOHN W. DINSMORE.
EDWIN A. ALDERMAN, *Secretary.*
JOHN P. REA.
JOSEPH WHEELER.
JAMES S. GORMAN.

UNITED STATES MILITARY ACADEMY.

ANNUAL REPORT

OF THE

SUPERINTENDENT U. S. MILITARY ACADEMY.

HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., September 26, 1893.

SIR: I have the honor to submit this my annual report for the Military Academy for the year ending September 1, 1893:

Having been appointed Superintendent by the President, by letter dated March 23, 1893, I assumed command of the Academy and of the post of West Point under the authority contained in paragraph 2, Special Orders, No. 65, Adjutant-General's Office, March 24, 1893, on the 1st of April last, relieving Col. John M. Wilson, Corps of Engineers. I found the institution in a state of efficiency as high as any that I have known it to reach.

PERSONNEL.

The number of officers and instructors on duty at West Point September 1, 1893, was 8 professors, 1 associate professor, 55 commissioned officers, 1 swordmaster, and 1 teacher of music; a total of 66. (See roster appended, marked A.) The number September 1, 1892, was 63. The increase during the year was effected by the assignment of one officer for duty in the department of modern languages, one in the medical department, and one as post commissary, in addition to the number which had previously been found necessary. On the 1st of October, 1892, Capt. Edward E. Wood, Eighth Regiment of Cavalry, was appointed by the President professor of modern languages to succeed Prof. George L. Andrews, who had retired from active service. On the 14th of March, 1893, First Lieut. Wright P. Edgerton, Second Regiment of Artillery, was appointed by the President associate professor of mathematics, an office created by act of March 1, 1893. In all 16 officers joined during the year and 13 were relieved.

It is believed that the present number is in excess of the absolute necessities of the case and may gradually be reduced as the terms of service of some of the officers concerned expire, unless the number of cadets be increased. The very great inconvenience to which some of the departments of instruction are subjected by a lack of the facilities to be furnished by the new academic building renders it necessary for them to have more instructors than they will require after the completion of that building.

The importance of selecting with care the officers detailed for duty as instructors at the Academy need not be enlarged upon. There are many officers, accomplished in their profession, who do not possess the peculiar qualities necessary to a good teacher of youth. That the field for selection should not be unnecessarily restricted is self-evident. Under the

rulings of the War Department and under the law there are unavailable for this duty (1) all officers on duty at civil colleges; (2) all artillery officers serving with light batteries; (3) all officers holding regimental staff positions; (4) all officers on detached service; (5) all engineer and ordnance officers, except those required in the departments of engineering, practical engineering, and ordnance; (6) all officers who have served less than four years after graduation. In addition to these disqualifications the quarters for officers at the post are so limited that it is necessary to take into account the family status of the officer, whether he be married or unmarried. The rulings referred to have no doubt been the result of necessity, either temporary or permanent, and may be modified as the necessity ceases. The act approved June 30, 1882, making appropriations for the support of the Military Academy provided as follows, viz: "And hereafter no graduate of the Military Academy shall be assigned or detailed to serve at said Academy as a professor, instructor, or assistant to either within four years after his graduation." If the object of this law be to prevent any person from being placed in authority over cadets who has himself been a cadet companion of theirs—and I can think of no other—it is both unnecessary and ineffective. The superintendent is authorized under the academic regulations to detail as many cadets to act as assistant instructors as may be required. The discipline of the corps is very largely maintained by the cadet officers. The law is not in sympathy with one of the most important fundamental principles taught here, viz: That personal relations and official relations have nothing to do with each other. It removes from the field of selection a large number of young officers in every way qualified as instructors. Their studies here are still comparatively fresh in their minds, they possess the special qualities which later on lead to their selection for special duties and the consequent disqualification under the rulings, and generally they are unmarried.

I recommend that Congress be requested to repeal the law.*

The number of cadets, present and absent, September 1, 1893, was 318, including 3 foreigners receiving instruction by special authority of Congress in each case. The number September 1, 1892, was 290, including 2 foreigners. During the year 4 were discharged for disability, 14 were discharged for deficiency in studies, 11 resigned, and 51 were graduated; while there were admitted in all at the three examinations held in March, June, and August, respectively, 108, including 2 foreigners.

At the examination for admission in March 166 candidates, including 60 alternates, had been appointed. Of these 35 failed to appear and 81 were found not duly qualified, either mentally or physically, or both. Of the remaining 50 who passed 7 were alternates, whose principals also passed and for whom there were therefore no vacancies, leaving 43 who were admitted. At the examination in June of 149 candidates (principals and alternates) appointed 28 failed to appear, 63 failed to pass, and of the remaining 58, 3 were alternates whose principals also passed, leaving 55 who were admitted. At the examination in August of 15 appointed 1 failed to appear, 6 failed to pass, and 1 who passed was an alternate whose principal also passed, leaving 7 who were admitted. The experience of former years has been similar to this, and shows clearly that it is not practicable to keep the number of cadets up to the maximum authorized by law, and that there will always be many

* Since writing the above the academic board has expressed its views upon the same subject in a resolution which, with remarks by the professor of mathematics, will be found in appendix H.

vacancies. The number now authorized is 371, omitting the foreigners, an excess of 56 above the number actually belonging to the Academy. It is desirable, I think, from every point of view that the Academy be worked up to the full capacity of its present plant. It should furnish all the officers for our Army in time of peace, which it can not now do, and if, in addition, it could send into civil life each year a few young men trained as its graduates are, the country would be the gainer by many times the trifling additional cost of their education. A moderate increase in the number of cadets authorized by law is accordingly recommended, such, for example, as would be obtained by appointing two at large from each State, to be nominated by the Senators representing the State in Congress.

ACADEMIC DEPARTMENTS.

The departments of philosophy, drawing, mathematics, chemistry, etc., history, etc., engineering, law, modern languages, tactics, practical military engineering, and of ordnance and gunnery have maintained the high standard of instruction for which they have always been noted. While the heads of these departments have not failed to keep abreast with all advances made in their special branches of knowledge and to introduce improvements when opportunity offered, the changes in the majority of them have been of a minor character and do not call for special mention here.

In the department of mathematics the appointment of an associate professor is an improvement in organization which will be of substantial benefit.

In the department of modern languages there has been a rearrangement of time, beginning with the present academic year, by which the study of Spanish is transferred from the first class to the third class, and the time allotted to the department for English, French, and Spanish is arranged so that but one of these studies shall occupy its attention at a time, instead of English and French alternating with each other, as before. There have been numerous changes of text-books in this department. The effect of the rearrangement is to give a more compact course, in which the various studies follow each other in more logical sequence, rendering it possible to accomplish more in a given time than under the old arrangement. Its effect upon the other departments is to leave vacant some sixty recitations in the first-class year, to be allotted hereafter between those departments.

In the department of ordnance and gunnery good progress was made in a general revision of the text-books. This work will be continued during the coming year.

The department of law is the only one headed by a full professor that is not provided with an assistant professor having the pay of captain mounted. It seems but just that this department should be placed upon the same footing in this respect as the others. I recommend that legislation authorizing the appointment of an assistant professor of law be solicited.

THE LIBRARY.

There were added to the library during the last fiscal year 578 volumes and 71 pamphlets—books containing less than 100 pages. There are now on hand 36,062 bound volumes and 5,328 pamphlets, besides many valuable manuscripts, maps, and portraits. The library has entirely outgrown the space heretofore allotted to it. One of the most

pressing needs of the Academy is the reconstruction internally of the library building, by which it shall be made fireproof and shall provide proper space for a convenient arrangement of the books and for reading rooms. The necessity for this and the manner in which it may be accomplished are explained in the report of the librarian, hereto appended, marked B, to which attention is invited for details.

HEALTH.

As a rule ailments among the cadets during the year were of minor character and of short duration. No case of typhoid fever, scarlatina, diphtheria, or other disease due to a lack of sanitary precautions occurred among them. The health of the other portions of the command also, upon the whole, was good. For details attention is invited to the report of the post surgeon, hereto appended, marked C. The sanitary condition of the post is generally good, but there is an exception in the case of the ten old wooden buildings known as Logtown occupied by twenty soldiers' families, situated on the slope of the hill west of the engineer barracks. Owing to the high and steep slope above these buildings it is difficult to keep them dry during the winter and spring. An estimate for improving the drainage in the vicinity has been submitted this year. In continuation of the policy inaugurated twenty years ago of removing all the old wooden quarters for soldiers' families from the slopes at the northern part of the post, an estimate has also been submitted for building new quarters upon high and healthy ground with a view to pulling these down.

DISCIPLINE.

The state of discipline of the corps has been generally excellent. It was necessary to convene a court-martial only once during the year, and in that case the cadet brought before it was acquitted. Offenses were committed in the latter part of August by three cadets which involved trial by court-martial, but the court had not been convened within the period covered by this report. The usual discipline was maintained in the other portions of the command by the usual methods.

ACCOUNTS AND SUPPLIES.

The system of keeping the accounts and of furnishing the cadets with supplies continued essentially as heretofore reported. An abundance of good, healthy food in sufficient variety was furnished at an average cost of about 52¼ cents per man per day. Clothing, books, and other articles were furnished of good quality and at low rates. The only article of which serious complaint was made is the shoe. A board of officers has been appointed to investigate the subject. Attention is invited for details to the report of the treasurer and quartermaster and commmissary of cadets hereto appended, marked D.

ARTILLERY.

Good progress was made during the year in replacing guns and carriages which had become obsolete with those of modern pattern. Important additions were made to the list of models and sample guns for the general theoretical instruction of cadets. For details attention is invited to the report of the instructor of ordnance and gunnery, extracts from which are hereto appended, marked E.

For many years the horses used in the light battery have been the same as those used for instruction in riding and cavalry drill, and the drivers have been obtained from the cavalry detachment. The arrangement has not been entirely satisfactory. Horses well fitted for light cavalry exercises are not the best for artillery purposes, and *vice versa*. It would be better if an entirely separate set of horses could be provided for the light battery, yet, in view of the fairly good results which have been obtained, I am not prepared to recommend so considerable an increase in the expenses of the Academy. Again, the service as artillery drivers has not been popular with the cavalry soldiers. Their instruction and service as drivers is additional to their regular duties, and is under officers different from their regular officers. It involves considerable wear and tear of clothing, for which they have not received compensation. This difficulty may be remedied by allowing the men a small amount of extra pay. Upon this subject the commandant of cadets says:

I would invite attention specially to an item which I have included in the estimates submitted this year, viz, $840. This is for additional pay to noncommissioned officers, trumpeters, and privates of the cavalry detachment detailed on duty as drivers with the instruction battery of field artillery of the United States Military Academy. This item is to pay these twenty-eight men 30 cents a day for the time that they are so employed, viz, during the months of April, May, July, August, and October, and as a compensation to them for the additional wear and tear of their clothing while performing this work, which is in addition to that performed by their comrades. I believe if this item is approved, this additional pay will secure the very best men for service in this detachment, and the additional knowledge which they will possess as artillery drivers will not impair their efficiency as cavalrymen.

The item was included in my annual estimates and is earnestly recommended.

There was no target practice with the siege guns, as it is believed that there is danger of bursting them. A new armament for the siege battery is expected at an early day.

VISIT TO THE COLUMBIAN EXPOSITION.

Under the authority contained in your letter of July 7, 1893, the battalion of cadets, the band and field music, a detachment of the hospital corps, and the camp attendants, all under the command of the commandant of cadets, were ordered to Chicago to witness the World's Columbian Exposition. They left here August 17, arriving at Chicago the following day, and left Chicago upon their return August 28. The members of the second class on furlough to August 28 were allowed to join in time for the visit. All but fifteen took advantage of the permission. With the exception of these fifteen, and two who were absent on sick leave, every cadet belonging to the corps accompanied it. A plat of the ground assigned for their use having been obtained a plan of their camp was prepared here and together with their camp equipage was sent in advance. Their tents were erected and camp ready for occupancy upon their arrival. A contract for the subsistence of the entire command had been made with one of the exposition restaurants located near the camp ground. The Quartermaster's Department furnished the necessary transportation. The exposition authorities gave every facility within their power, assigning for the camp ground the most desirable spot within the grounds, furnishing at their own expense the tent floors, remitting the usual royalty of 25 per cent upon the receipts of the restaurant, and reducing by that amount the cost of subsistence, furnishing free entrance and exit to the grounds, etc.

The object in sending the cadets to Chicago was not only to advance their education, but also to make friends for the Academy by exhibiting to large numbers of persons the excellence of their training. The visit was highly successful in both particulars. A serious breach of discipline by three cadets was immediately acted on by the commandant in a manner which prevented it from injuring the reputation of the corps. With this exception the bearing of the entire command was highly creditable. There was no accident and no sickness of consequence. I have little doubt that the visit has been of important benefit to the Academy.

BAND.

By the act of March 3, 1877, the Military Academy band was reduced to 1 teacher of music and 24 enlisted men, which is its present authorized strength. Of the enlisted men 6 receive $34 per month, 6, $20, and the remaining 12, $17, with the usual allowances of enlisted men. At the time of this reduction the band consisted of 1 teacher of music and 40 enlisted musicians of whom 10 received $34 and the remaining 30 received $30 per month, with the usual allowances of enlisted men. Since that date every Superintendent of the Academy, with perhaps one exception, and many or all Boards of Visitors have recommended an increase of the band. The Board of Visitors this year recommend that the band be increased to at least 40 members and a leader. To any one familiar with music it needs no argument to prove that the present numbers and pay are not sufficient. Is a good band really necessary to the practical efficiency of the Academy, is the only question which can be asked. The answer is plain when the purpose which the band subserves is considered. Military pomp has a serious and practical object—the cultivation of the military spirit. It is in the same category with patriotic songs, discipline, and monuments to dead heroes. There is no more essential part of it than good music. I recommend that the band be restored to the numbers and pay which it had before the reduction in 1877. I recommend, further, that the leader receive the rank, pay, and emoluments of a second lieutenant of infantry. The increase is desired not for the purpose of gratifying an idle vanity or merely to provide pleasure, but to improve the finer polish given to the finished product of the Academy.

WATER SUPPLY.

The necessity of increasing the supply of water for the post has been fully pointed out in the reports of my predecessors. At its last session Congress appropriated $16,000 for a new reservoir. A careful study of the ground, including a thorough exploration of the proposed site of the new dam, has been made this season. The indications are that a different character of dam will be required from that upon which the estimate and appropriation were based, and that the sum now available will not be sufficient. The question is receiving careful study and a new estimate will be prepared if necessary.

The existing reservoirs may be largely improved by strengthening and raising their dams and cleaning both the reservoirs and their watersheds. An estimate of $25,000 has been submitted for that purpose.

The water supply has been under the charge of the instructor of practical military engineering. For details attention is invited to the extracts from his report, hereto appended, marked F.

MASTER OF THE SWORD.

The swordmaster is also the instructor in gymnastics and swimming. He is a civilian, appointed by the Secretary of War. The present incumbent has worked up an admirable course of gymnastics for the corps of cadets. His system of calisthenics has been adopted by the War Department for the use of the Army. He is required to preserve discipline and to exercise control of cadets while under his instruction. It would greatly strengthen his hand if he should have military rank, and, in view of the great and increasing importance of his department, I recommend that legislation be solicited giving him the rank, pay, and emoluments of a first lieutenant of infantry.

ADJUTANT OF THE ACADEMY.

The adjutant of the Academy is also secretary of the Academic Board and upon occasions of ceremony acts as aide-de-camp to the superintendent. His duties are at least as important as those of an assistant professor, and they are more onerous, while his personal expenses are greater. It seems but just that the officer holding this position should receive the pay of captain, mounted, as in the case of assistant professors. Legislation to that effect is recommended.

BUILDINGS AND GROUNDS.

The report of the post quartermaster, who is also quartermaster and disbursing officer of the Academy, is hereto appended, marked G. Attention is invited especially to the explanations given therein why an increase of the detachment of Army-service men is necessary. The force is not sufficient to properly care for the post. The same is true of the regular annual appropriation for repairs and improvements. An increase of that item has been asked for in the estimates.

The new gymnasium building was completed sufficiently for use last autumn, and with the consent of the contractor it was occupied November 1, 1892. Certain small items of work remained to be done to finally complete the building, but these the contractor refused to do, alleging that they formed no part of his contract. The controversy over this subject has lasted through the year, though it seems now to be in a fair way to settlement. Final payment has not yet been made. The building has been thoroughly equipped with modern appliances. It has proved a source of great benefit, as well as pleasure, to the cadets. It is perhaps the most important addition to the equipment of the Academy that has been made for many years.

The progress made during the year upon the new academic building has been much less rapid than was hoped, and there is little prospect that any portion of it will be ready for use during the present academic year. The material and workmanship are satisfactory. The time for completing the contract has been extended to September 15, 1894, with the condition that all additional expenditures made necessary to the United States by reason of the extension of time are to be deducted from sums due the contractor. The contract is for completing the building without the high clock tower, which formed part of the original design, the funds available not being sufficient to include the tower. The construction of this tower is so important, both as an architectural feature and as a means of displaying prominently the clock, that I have submitted an estimate for an additional appropriation for the purpose of building it.

The new building for sinks and bathrooms for cadets and the new boiler house are well advanced, and it is hoped may be ready for use before the end of October.

The new gas works are also well advanced and it is expected will be completed about the end of October.

The contractors are behind time with all of these buildings.

In the cadet barracks new gas fixtures, each consisting of a two-light pendant, besides a sliding droplight, were placed in all the living rooms. With the abundant supply of gas to be provided by the new works there should be no further complaint of insufficient light.

The battle monument has made but little progress during the year, owing to a strike among the granite-workers, and unforeseen difficulties in the preparation of the polished shaft.

An extensive and much-needed improvement of the road leading south through what was formerly the Kinsley estate has been begun and is now well advanced. It is proposed to place the new set of officers' quarters, for which funds are now available, upon the east side of this road and thus to inaugurate the extension of the post southward over the new property. It is proposed also to move the south guardhouse and gate to a point much further south.

The roads upon the reservation, except upon the post proper, are not in good condition. A beginning has been made toward their amelioration by the purchase this year of a stone crusher For use in connection therewith a heavy steam roller is badly needed. An estimate of $4,500 for the purchase of one has been sent in since the regular annual estimates, and is recommended to the favorable consideration of Congress.

ESTIMATES.

The estimates for the next fiscal year were forwarded on the 29th of July. While somewhat larger than the appropriations for the current year they do not include anything which is not in my judgment for the good of the Academy, nor do they include everything which might with propriety be asked for. They are all commended to favorable consideration.

CONCLUSION.

In conclusion it gives me pleasure to state that I have received the earnest and cordial support of every professor and officer stationed here. They deserve and receive my hearty thanks.

Very respectfully, your obedient servant,

O. H. ERNST,
Colonel of Engineers, Superintendent.

The ADJUTANT-GENERAL, U. S. ARMY,
Washington, D. C.

A.

UNITED STATES MILITARY ACADEMY.

WEST POINT, NEW YORK.

SUPERINTENDENT.

Col. O. H. ERNST, Major, Corps of Engineers.

MILITARY STAFF.

First Lieut. John M. Carson, jr., Fifth Cavalry, adjutant of the Military Academy post adjutant and recruiting officer.
Capt. William F. Spurgin, Twenty-first Infantry, treasurer of the Military Academy and quartermaster and commissary of cadets.
Capt. William H. Miller, assistant quartermaster, U. S. Army, quartermaster of the Military Academy, post quartermaster and disbursing officer.
First Lieut. Barrington K. West, Sixth Cavalry, post commissary of subsistence and post treasurer, in charge of post exchange.
Second Lieut. William C. Rivers, First Cavalry, assistant to post quartermaster and officer of police.
Maj. Philip F. Harvey, surgeon, U. S. Army, post surgeon.
Capt. C. N. Berkeley Macauley, assistant surgeon, U. S. Army.
First Lieut. Frederick P. Reynolds, assistant surgeon, U. S. Army.

ACADEMIC STAFF.

Professors whose service at the Academy, as professor, exceeds ten years, have the assimilated rank of colonel, and all other professors the assimilated rank of lieutenant-colonel.

DEPARTMENT OF NATURAL AND EXPERIMENTAL PHILOSOPHY.

Peter S. Michie, professor (14 Feb., 1871).
First Lieut. Frank S. Harlow, First Artillery, assistant professor.
First Lieut. Samuel E. Allen, Fifth Artillery; First Lieut. Lucien G. Berry, Fourth Artillery, instructors.
First Lieut. Samuel D. Freeman, Tenth Cavalry, in charge of observatory and astronomical observations.

DEPARTMENT OF DRAWING.

Charles W. Larned, professor (25 July, 1876).
First Lieut. George H. Cameron, Fourth Cavalry, assistant professor.
First Lieut. Austin H. Brown, Fourth Infantry; First Lieut. Cecil Stewart, Fourth Cavalry, instructors.

DEPARTMENT OF MATHEMATICS.

Edgar W. Bass, professor (17 April, 1878).
Wright P. Edgerton,* associate professor (14 Mar., 1893).
First Lieut. George F. Barney, Second Artillery; First Lieut. Edmund D. Smith, Nineteenth Infantry; First Lieut. Robert L. Hirst, Eleventh Infantry; First. Lieut. Daniel B. Devore, Twenty-third Infantry; First Lieut. John D. Barrette, Third Artillery; First Lieut. Frank McIntyre, Nineteenth Infantry; Second Lieut. Charles D. Palmer, Fourth Artillery; Second Lieut. John S. Winn, Second Cavalry, instructors.

DEPARTMENT OF CHEMISTRY, MINERALOGY, AND GEOLOGY.

Samuel E. Tillman, professor (21 Dec., 1880).
First Lieut. John P. Wisser, First Artillery, assistant professor.
First Lieut. Harry Freeland, Third Infantry; First Lieut. Richmond P. Davis, Second Artillery; Second Lieut. Edgar Russell, Third Artillery, instructors.

*Associate professor with the rank of captain.

DEPARTMENT OF HISTORY, GEOGRAPHY, AND ETHICS.

William M. Postlethwaite, chaplain, professor (21 Dec., 1881).
First Lieut. Daniel H. Boughton, Third Cavalry, assistant professor.
First Lieut. James A. Cole, Sixth Cavalry, instructor.

DEPARTMENT OF CIVIL AND MILITARY ENGINEERING.

James Mercur, professor (29 Sept., 1884).
First Lieut. Joseph E. Kuhn, Corps of Engineers, assistant professor.
First Lieut. Henry C. Newcomer, Corps of Engineers; First Lieut. Thomas H. Rees, Corps of Engineers, instructors.

DEPARTMENT OF LAW.

John W. Clous, lieutenant-colonel and deputy judge-advocate-general, U. S. Army, professor (28 Aug., 1890). (By assignment under act 6 June, 1874.)
First Lieut. Daniel H. Boughton, Third Cavalry; First Lieut. James A. Cole, Sixth Cavalry, instructors.

DEPARTMENT OF TACTICS.

Lieut. Col. Samuel M. Mills, captain, Fifth Artillery, commandant of cadets and instructor of tactics (1 Sept., 1892).
Capt. Louis A. Craig, Sixth Cavalry, senior assistant instructor of cavalry tactics.
First Lieut. Alexander B. Dyer, Fourth Artillery, senior assistant instructor of artillery tactics.
First Lieut. Samuel W. Dunning, Sixteenth Infantry, senior assistant instructor of infantry tactics. Commanding band and detachment of field music.
First Lieut. Wilds P. Richardson, Eighth Infantry, assistant instructor of tactics. Commanding company of cadets.
First Lieut. William H. Allaire, Twenty-third Infantry, assistant instructor of tactics. Commanding company of cadets.
First Lieut. Willard A. Holbrook, Seventh Cavalry, assistant instructor of tactics. Commanding company of cadets.
First Lieut. T. Bentley Mott, First Artillery, assistant instructor of tactics. Commanding company of cadets.
Second Lieut. Matthew C. Butler, jr., Fifth Cavalry, assistant instructor of cavalry tactics.

DEPARTMENT OF MODERN LANGUAGES.

Edward E. Wood, professor (1 Oct., 1892).
First Lieut. Cornélis DeW. Willcox, Second Artillery, assistant professor of the Spanish language.
First Lieut. Arthur F. Curtis, Second Artillery, assistant professor of the French language.
First Lieut. William S. Biddle, jr., Fourteenth Infantry; First Lieut. Arthur Thayer, Third Cavalry; First Lieut. Peter E. Traub, First Cavalry; First Lieut. Benjamin A. Poore, Sixth Infantry; Second Lieut. Marcus D. Cronin; Twentieth Infantry, instructors.

DEPARTMENT OF PRACTICAL MILITARY ENGINEERING.

Capt. James L. Lusk, Corps of Engineers, Instructor (31 March, 1893).
First Lieut. Mason M. Patrick, Corps of Engineers, assistant instructor

DEPARTMENT OF ORDNANCE AND GUNNERY.

Capt. Lawrence L. Bruff, Ordnance Department, instructor (17 Aug., 1891).
First Lieut. Edwin B. Babbitt, Ordnance Department; First Lieut. John C. W. Brooks, Fourth Artillery, assistant instructors.
Second Lieut. Charles S. Bromwell, Corps of Engineers, on duty with Company E, battalion of engineers.
Herman J. Koehler, master of the sword.
Arthur A. Clappé, teacher of music.

List of officers, with relative rank, at the U. S. Military Academy.

Name.	Corps or regiment.	On duty at Academy since—
Colonels.		
Ernst, Oswald H	Corps of Engineers	April 1, 1893.
Michie, Peter S	Professor (February 14, 1871)	April 23, 1867.
Larned, Charles W	Professor (July 25, 1876)	August 28, 1874.
Bass, Edgar W	Professor (April 17, 1878)	September 15, 1876.
Tillman, Samuel E	Professor (December 21, 1880)	August 28, 1879.
Postlethwaite, William M	Professor (December 21, 1881)	January 6, 1882.
Lieutenant-Colonels.		
Mercur, James	Professor (September 29, 1884)	October 7, 1884.
Clous, John W	Professor (August 28, 1890)	August 28, 1890.
Mills, Samuel M	Captain, Fifth Artillery, commandant of cadets.	September 1, 1892.
Wood, Edward E	Professor (October 1, 1892)	August 28, 1889.
Major.		
Harvey, Philip F	Surgeon, Medical Department	November 25, 1892.
Captains.		
Spurgin, William F	Twenty-first Infantry	September 2, 1881.
Macauley, C. N. B	Assistant surgeon, Medical Department.	February 6, 1893.
Lusk, James L	Corps of Engineers	March 31, 1893.
Bruff, Lawrence L	Ordnance Department	August 17, 1891.
Miller, William H	Assistant quartermaster, Quartermaster's Department.	November 8, 1890.
Craig, Louis A	Sixth Cavalry	August 28, 1890.
Edgerton, Wright P	Associate professor (March 14, 1893)	January 28, 1889.
First Lieutenants.		
Dyer, Alexander B	Fourth Artillery	August 31, 1892.
Wisser, John P	First Artillery	August 29, 1886.
Boughton, Daniel H	Third Cavalry	April 5, 1890.
Dunning, Samuel W	Sixteenth Infantry	August 29, 1891.
Harlow, Frank S	First Artillery	June 21, 1890.
Allen, Samuel E	Fifth Artillery	August 20, 1892.
Kuhn, Joseph E	Corps of Engineers	August 31, 1889.
Newcomer, Henry C	Corps of Engineers	August 20, 1892.
Barney, George F	Second Artillery	August 28, 1889.
Babbitt, Edwin B	Ordnance Department	August 28, 1890.
Patrick, Mason M	Corps of Engineers	April 25, 1892.
Brooks, John C. W	Fourth Artillery	August 28, 1889.
Freeman, Samuel D	Tenth Cavalry	June 30, 1893.
Smith, Edmund D	Nineteenth Infantry	August 17, 1891.
Richardson, Wilds P	Eighth Infantry	February 10, 1892.
Rees, Thomas H	Corps of Engineers	August 22, 1893.
Allaire, William H	Twenty-third Infantry	June 15, 1893.
Hirst, Robert L	Eleventh Infantry	August 17, 1891.
West, Barrington K	Sixth Cavalry	February 18, 1893.
Cameron, George H	Fourth Cavalry	August 28, 1888.
Cole, James A	Sixth Cavalry	August 20, 1892.
Wilcox, Cornélis DeW	Second Artillery	Do.
Carson, John M., jr	Fifth Cavalry	May 15, 1890.
Curtis, Arthur F	Second Artillery	August 20, 1892.
Holbrook, Willard A	Seventh Cavalry	Do.
Brown, Austin H	Fourth Infantry	February 9, 1892.
Biddle, William S., jr	Fourteenth Infantry	August 21, 1892.
Devore, Daniel B	Twenty-third Infantry	August 20, 1892.
Reynolds, Frederick P	Assistant surgeon, Medical Deparment	February 22, 1893.
Barrette, John D	Third Artillery	August 20, 1892.
Thayer, Arthur	Third Cavalry	August 17, 1891.
McIntyre, Frank	Nineteenth Infantry	August 28, 1890.
Freeland, Harry	Third Infantry	June 16, 1890.
Stewart, Cecil	Fourth Cavalry	April 25, 1891.
Poore, Benjamin H	Sixth Infantry	August 22, 1893.
Berry, Lucien G	Fourth Artillery	August 20, 1892.
Traub, Peter E	First Cavalry	November 11, 1892.
Mott, T. Bentley	First Artillery	July 1, 1890.
Davis, Richmond P	Second Artillery	August 17, 1891.
Second Lieutenants.		
Russel, Edgar	Third Artillery	August 22, 1893.
Rivers, William C	First Cavalry	October 7, 1891.
Cronin, Marcus D	Twentieth Infantry	August 22, 1893.
Palmer, Charles D	Fourth Artillery	August 20, 1892.
Winn, John S	Second Cavalry	August 22, 1893.
Butler, Matthew C	Fifth Cavalry	June 15, 1893.
Bromwel, Charles S	Corps of Engineers	June 1, 1893.

TROOPS.

Battalion of Cadets.

Lieut. Col. Samuel M. Mills, captain, Fifth Artillery, commanding.
Company A, First Lieut. Wilds P. Richardson, Eighth Infantry, commanding.
Company B, First Lieut. William H. Allaire, Twenty-third Infantry, commanding.
Company C, First Lieut. T. Bentley Mott, First Artillery, commanding.
Company D, First Lieut. Willard S. Holbrook, Seventh Cavalry, commanding.

Hospital Corps.

Maj. Philip F. Harvey, surgeon, U. S. Army, commanding.
Capt. C. N. Berkeley Macauley, assistant surgeon, U. S. Army.
First Lieut. Frederick P. Reynolds, assistant surgeon, U. S. Army.

U. S. Military Academy Detachment of Army Service Men.

Capt. William H. Miller, A. Q. M., post quartermaster, commanding.
Second Lieut. William C. Rivers, First Cavalry.

Company E, Battalion of Engineers.

Capt. James L. Lusk, Corps of Engineers, commanding.
First Lieut. Mason M. Patrick, Corps of Engineers.
Second Lieut. Charles S. Bromwell, Corps of Engineers.

U. S. Military Academy Detachment of Ordnance.

Capt. Lawrence L. Bruff, Ordnance Department, commanding.
First Lieut. Edwin B. Babbitt, Ordnance Department.

U. S. Military Academy Detachment of Cavalry.

Capt. Louis A. Craig, Sixth Cavalry, commanding.
Second Lieut. Matthew C. Butler, jr., Fifth Cavalry.

U. S. Military Academy Band and Detachment of Field Music.

First Lieut. Samuel W. Dunning, Sixteenth Infantry, commanding.

HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., September 1, 1893.

J. M. CARSON, JR.,
First Lieutenant, Fifth Cavalry, Adjutant.

Official:

B.

U. S. MILITARY ACADEMY LIBRARY.
West Point, N. Y., September 11, 1893.

The ADJUTANT, U. S. MILITARY ACADEMY:

SIR: I have the honor to submit the following statement in regard to the library, in accordance with your request dated West Point, N. Y., August 26, Circular No. 35:

The so-called library building was erected in 1841, and only a portion of it was assigned to the library of the Military Academy. This portion, a high-ceiling room 46 feet square and 31 feet high, is but a small portion of the building, which is 160 feet in length and 78 feet in breadth. The remainder was apportioned to the West Point Observatory and the philosophical department. A new observatory having been erected by the West Shore Railroad Company, is now occupied, and the instruments have been removed from the old piers in the library building, so that the main room under the dome, 27 feet in diameter, and the transit and mural circle towers at

the east and west ends of the building will be available for the uses of the library when the piers are removed. The remainder of the space is occupied now by the philosophical department for lecture and instruction purposes. This will be available as soon as the new academic building is completed, or rather when the south wing of that building is finished. To properly arrange all of the above for the purposes of the library it will be necessary to remove the massive stone piers, take down partitions and floors, and put in new windows and shelves. The building is not fireproof, and the opportunity for complete renovation will be so favorable that this obvious improvement of making the building fireproof should not be neglected. For the complete renovation of this building, to make it a suitable fireproof depository for the valuable collection of books, pamphlets, maps, portraits, etc., I have thought would require at least $40,000,* and I hereby renew my application that this amount be asked for at the present session of Congress.

There are at present 36,062 bound volumes and 5,328 pamphlets (books under 100 pages), besides very many valuable manuscripts, maps, portraits, etc., to be arranged and cared for. During the last fiscal year the increase was 578 volumes and 71 pamphlets. With the present accommodations no proper disposition can be made of many of these books. They fill the desks and tables in the library room that should be used for reading and consultation by the cadets and officers, and many are also piled on the floor in corners, so that a difficulty often occurs in getting them for ready reference. No more pressing demand exists than the immediate renovation of the library building. Its valuable books, scientific and professional, suffer deterioration, owing to imperfect shelving and protection. There are no proper arrangements from present lack of space, whereby officers and cadets can in quiet refer to such professional books as they may desire to consult. A single room, constantly open to the public, and in which all library business is transacted, is not conducive to the quiet and peace needed for study. But the building is very capable of being put into such a condition as will make it all that can be desired, should the sum above mentioned be appropriated, and I earnestly renew my recommendation.

Very respectfully, your obedient servant,

P. S. MICHIE,
Professor and Librarian.

HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., September 18, 1893.

A true copy.

J. M. CARSON, JR.,
First Lieutenant, Fifth Cavalry, Adjutant U. S. Military Academy.

C.

U. S. MILITARY ACADEMY,
SURGEON'S OFFICE, CADET HOSPITAL,
West Point, N. Y., September 11, 1893.

The ADJUTANT, U. S. MILITARY ACADEMY.

SIR: In compliance with Circular No. 35, Headquarters U. S. Military Academy, dated West Point, N. Y., August 26, 1893, I have the honor to submit the following report of the work done in the medical department at this station for the year ending June 30, 1893, with such remarks and suggestions as the interest of the service seem to call for:

The mean strength of the command for the year is shown by the following table:

Officers	52.59
Cadets	259.43
Enlisted men	326.03
Civilians, officers' families	197.00
Civilians, soldiers' families, civilian employés, and their families	476.00
Total entitled to medical service	1,311.05

The number of sick treated during the year was as follows: Officers, injured, 1; sick, 24; total, 25; cadets treated in hospital, injured, 97, sick, 398; total, 495. Aggregate number of days lost by cadets in hospital, 2,561. Cadets treated in

*Increased by the Superintendent to $50,000.

quarters and excused from some duty, 3,651. Cadets treated in quarters and not excused from duty, 1,280. Officers' families, servants, and other civilians who have received treatment from the cadet hospital, 324. The number of prescriptions put up at the cadet hospital during the year was as follows: For officers, 75; for cadets, 6,174; for civilian attachés, 693; total, 6,942.

There were performed during the year 111 vaccinations, of which number 107 were successful.

The prevalent forms of sickness requiring treatment in this hospital were as follows: Headache, 35; ephemeral fever, 60; diseases of the eye, including refractive, muscular, and inflammatory affections, 54; diseases of the digestive organs, 68; tonsilitis, 35.

It is gratifying to be able to report that not a single case of typhoid fever, scarlatina, diphtheria, or other disease due to a lack of sanitary precautions has occurred in the corps of cadets during the year. One death is reported in August, 1892, from "heart clot" complicating an attack of pleuro-pneumonia.

As a very general rule ailments among the cadets have been of minor character and of short duration. The reason for the large apparent aggregate of sickness is to be found in the fact that the constant mental and physical activity demanded of the cadet by the curriculum of West Point requires an organic and functional integrity of all parts of the body, and the most trivial ailment is sufficient to disqualify for some duty.

There was a daily average of 11.52 officers and cadets sick during the year; in April, 1893, occurred the largest daily average, when it rose to 16.17.

There were 97 cases treated in the cadet hospital for injury. Several rather severe casualties happened in outdoor games and in exercise at will in the gymnasium. Football contributed the bulk of such casualties, and in some cases the injuries were of such gravity as to threaten permanent disability, but happily in every instance complete recovery ultimately resulted. It is doubtful, in my opinion, if the benefits derived from playing this game, which I am free to acknowledge are very considerable in some directions, are commensurate with the risks it entails to life and limb, which, according to statistics, are much greater than are commonly supposed.

The cadet hospital is in excellent condition for the reception and treatment of the sick, having a liberal equipment of modern medical and surgical material and appliances, and being provided with ample means of drainage and ventilation. During the year a culinary department for cadet patients, entirely separate from the one used for the members of the hospital corps, has been put into successful operation with entirely satisfactory results. The food furnished the hospital has invariably been the best in quality and variety the market afforded, and the cooking has uniformly been excellent as verified by frequent inspections by the post surgeon.

Substantially all the work contemplated by last year's appropriation for cadet hospital has been done. The inclosed area in rear of building has been properly graded and thoroughly concreted to prevent dampness of basement walls and to secure thorough conduction of rain and snow water into the main house drain; the trenches containing return heating pipes in cellar have been covered by iron plates and neatly luted; the floors have been relacquered throughout, the iron work rejapanned, and the radiators rebronzed, etc., and other repairs of a minor character have been made, and the building is believed to be in very thorough repair. Repainting inside walls and ceilings (two coats) and woodwork throughout has just been finished (September 1).

Although it is hoped that the continued enforcement of approved sanitary measures will obviate the appearance of any contagious disease among the cadets it has been deemed prudent to submit estimates of cost and material for a small detached building to secure perfect isolation of a patient if necessary. The cadet hospital does not afford facilities for perfect quarantine, and as it is a costly permanent structure, it would be unwise, I think, to treat contagious diseases in it.

A set of quarters for the senior hospital steward, on duty at the cadet hospital, is a desideratum. It is the policy of the medical department to quarter hospital stewards outside of hospital buildings, and it is believed that this hospital is unique in not having a detached building for the steward's occupation. It is hoped, therefore, that the necessary appropriation will be made for such quarters and their erection begun as soon as possible.

The following estimates of cost and labor have been furnished by the post quartermaster for the prospective needs of the cadet hospital and for the two buildings referred to above:

For repairs, etc	$2,788.70
For isolation hospital	3,007.50
For hospital steward's quarters	3,050.00
For soldiers' hospital	3,772.00
Total	12,618.20

The following medical officers are now or have been on duty at West Point during the year:

Maj. Henry McElderry, surgeon, post surgeon from July 1 to November 25, 1892.

Maj. Philip F. Harvey, surgeon, post surgeon from November 25, 1892, to date.

Capt. Henry S. Kilbourne, assistant surgeon, from July 1, 1892, to April 15, 1893.

Capt. C. N. B. Macauley, assistant surgeon, from February 5, 1893, to date.

First Lieut. Frederick P. Reynolds, assistant surgeon, from February 20, 1893, to date.

The services of three medical officers are, as a rule, indispensable to the proper discharge of the duties devolving on the medical department at West Point. The extent and varied character of the work would render embarrassment and overwork inevitable at times with a less number. An equitable proportion of these duties is assigned each officer, as follows: The post surgeon has general charge of the medical affairs of the Academy and post, and performs all professional service required at the cadet hospital and by officers and others requiring his attendance. The senior assistant has immediate charge of the soldiers' hospital, medical attendance upon enlisted men and their families, hygienic supervision of the barracks and quarters of the enlisted men, drill and instruction of the men of the hospital corps and company bearers. The junior assistant during the summer encampment reports to the commandant of cadets for night duty with the corps of cadets; in addition to this throughout the year he attends a portion of the sick among the enlisted men and their families, examines recruits, assists in stretcher drill, verifies medical reports, and assists in surgical cases, clinical analyses, etc.

The renovation and extension of the sanitary plumbing of the post was completed late in 1892, and since that time the system has appeared in all cases, as far as I have been able to learn, to effect complete removal of excreta and to prevent any reflux of deleterious effluvia. Although the introduction of the most modern and approved traps and flushes was not authorized, it is believed that the present facilities will, by the exercise of ordinary care, prove adequate for several years to come.

Fortunately there has been observed but little to condemn from a sanitary standpoint in connection with the Academy during the year, and hence but few sanitary recommendations have been required.

The following is a synopsis of those submitted with action taken:

BY THE POST SURGEON.

September, 1892: Recommendation that slop barrels in rear of Schofield Hall be covered, and the brick receptacle, as well as ground about it, be disinfected with chloride of lime. That the water of Delafield Reservoir be let out and the bottom cleaned. The reservoir had not been cleaned for fifteen years. (Maj. McElderry.) On inquiry I learn that the latter part of Maj. McElderry's recommendation was not carried out.

November, 1892: Recommendation that a garbage crematory be obtained for West Point. (Maj. McElderry.) Disapproved, as system in use deemed sufficient.

January, 1893: Owing to insufficient sleep obtained by cadets, recommended that they be allowed one hour more. (Maj. Harvey.) Carried into effect.

February, 1893: Recommendation for increased ventilation of cadet dormitories and quarters of civilian employés at cadet mess. (Maj. Harvey.) Approved.

March, 1893: Recommendation concerning the regulation of temperature in cadet rooms. Attention called to several basins in water closets out of order. Special care recommended in the collection and distribution of the water supply. (Capt. Kilbourne.) Approved.

April, 1893: Owing to possible prevalence of choleraic or allied disorders during the ensuing season, recommended that a thorough sanitary condition of all parts of the post be at once secured, and that extra efforts be made to keep premises in wholesome order. (Maj. Harvey.) Approved.

May, 1893: Reports stable in rear of officers' quarters No. 5 in an unsanitary condition. (Maj. Harvey.) Corrected.

ATTENDING SURGEON, SOLDIERS' HOSPITAL.

July, 1892: Reports that the bread is occasionally slack-baked and consequently wasted by the men. (Capt. Kilbourne.) Corrected.

August, 1892: Reports condition of water supply improved. (Capt. Kilbourne.)

September, 1892: Recommends daily removal of kitchen refuse from receptacle provided for it. Recommends coating of asphalt or other nonabsorbent material for the brick flooring of engineer barracks. Improved system of heating of engineer barracks recommended. Method of ventilation for band barracks recommended. Removal of fresh vegetables from basement of post guard-house recommended.

Recommends filtration of the water supplied to the soldiers' hospital. In the event of epidemic of cholera, should a case appear in the vicinity of the reservoir in the "Highlands," recommends surveillance. (Capt. Kilbourne.) Action: Recommendations for engineer and band barracks approved, but no funds available; other items approved and corrected.

October, 1892: On account of the number of cases of sore feet in the engineer company, trial of new soft shoe recommended (Capt. Kilbourne). Approved.

November, 1892: Recommends removal of obstruction to flow of water in ravine near garden of army service detachment. (Capt. Kilbourne.) Corrected.

December, 1892: Recommends that provision be made for the removal of laundry and kitchen slop waters from the new soldiers' quarters in "Rugertown" by means of a sewer falling into the hospital main, and that the outside taps from the water supply be taken into these quarters. (Capt. Kilbourne.) Approved, except so much as relates to taking water taps into quarters. No funds are available at present for constructing the sewer suggested.

January, 1893: Use of basement of band barracks as squad room for a portion of the army service detachment recommended discontinued. (Capt. Kilbourne.) Approved.

February, 1893: On complaint of prisoners in post guard house, recommended that they be allowed one additional blanket. (Capt. Macauley.) Approved.

March, 1893: Recommends that some arrangement be made by which the use of the attics of the engineer barracks as dormitories may be discontinued. Recommends that the vacated rooms in the basement of the band barracks be not again occupied as dormitories or squad rooms. Recommends grading of road in "Logtown" to prevent melted snow and rain water from draining into houses, also that ditches be dug around upper sides of outbuildings of quarters Nos. 97, 99, 101, and 105, their floors being continually wet. Recommends that the enlisted men be forbidden to wear the "barrack shoe" outside their quarters. (Capt. Macauley.) Action: The discontinuance of the use of the attic of engineer barracks and basement of band barracks as dormitories, and the digging of the ditch around the upper sides of outbuildings, approved. Grading of road in "Logtown" approved. Estimate to be submitted to Congress.

April, 1893: Recommends cleaning of obstructed ditch (for excess of spring water) in front of subdispensary. (Capt. Macauley.) Corrected.

May, 1893: Recommends a more frequent removal of the contents of the filter at the water house because of turbidity of general supply. (Capt. Macauley.) Approved.

June, 1893: Recommends that all earth closets be emptied every day, and that fresh earth be placed in them, after emptying, to the depth of an inch. (Capt. Macauley.) Approved as follows: Earth closets to be emptied every day and dry earth to be sprinkled in them when used.

The following is a summary of the data of general interest from the records of the soldiers' hospital for the year ending June 30, 1893:

Average strength of enlisted command	326.06
Number of enlisted men treated in hospital	97
Number of enlisted men treated in quarters	366
Total	463
Average number of civilians entitled to medical service	476
Total number of civilians taken sick	504
Number of births occurring in the families of enlisted men and civilian employés	29
Number of enlisted men discharged on surgeon's certificate of disability	3
Number of recruits examined for the period beginning May 1, 1893, and ending June 30, 1893	24
(The number for the year can not be furnished, the old "Register of Physical Examination of Recruits" having been forwarded to the Surgeon-General, as required by Army regulations.)	
Number of vaccinations and revaccinations—	
Total vaccinations	4
Total revaccinations	30
Number of deaths among soldiers and their families and civilian employés and their families	13

Of this number one soldier only died (September, 1892); cause of death, compression of the brain, the result of an accident. Other causes of death in this category were cholera infantum, convulsions, diphtheria, and consumption.

The total number of prescriptions compounded at the soldiers' hospital was 4,055.

The several duties of the medical officers acting in the capacity of assistants to the post surgeon have been most intelligently, faithfully, and zealously discharged; and discipline, efficiency, and attention to duty among the enlisted men of the hospital corps have, in the main, been highly satisfactory.

Very respectfully, your obedient servant,

P. F. HARVEY,
Major and Surgeon, U. S. Army, Post Surgeon.

HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., September 23, 1893.

A true copy.

J. M. CARSON, Jr.,
First Lieutenant, Fifth Cavalry, Adjutant, U. S. Military Academy.

D.

HEADQUARTERS U. S. MILITARY ACADEMY,
OFFICE TREASURY, QUARTERMASTER, AND COMMISSARY CADETS,
West Point, N. Y., September 14, 1893.

The ADJUTANT OF THE U. S. MILITARY ACADEMY,
West Point, N. Y.:

SIR: I have the honor to submit the following relative to my duties as treasurer of the Military Academy, quartermaster and commissary of cadets, for the year ending June 30, 1893, referring to each duty under the proper heading:

TREASURER OF THE MILITARY ACADEMY.

The business of the treasurer's office during the year has necessitated the keeping of twenty-eight separate accounts with cadets and others, all funds handled by the treasurer being such as are received bimonthly from the paymaster, U. S. Army, as pay of the cadets, and from officers on account of purchases made by them at the cadet quartermaster's department store, cadet mess for certain supplies sold them there, and for the washing of collars and cuffs at the laundry. The treasurer of the Academy receives no funds direct from the United States Treasury.

The treasurer's accounts have been inspected regularly every two months by an officer detailed by the Superintendent for that purpose, as well as by the special committee of the board of vistors in June, all of which inspections have been reported most satisfactory to the inspectors. The accounts kept are the same as noted in my annual report for 1892, with two new ones, viz: Athletic Association and Young Men's Christian Association.

The statement of the treasurer, U. S. Military Academy, dated May 16, 1892, which was the last statement made prior to the expiration of the fiscal year 1891–1892, was as follows:

Assets.		Liabilities.	
Deposited with the assistant treasurer of the United States, New York.	$30,834.37	Cadet laundry	$4,519.39
Miscellaneous items to be charged	40.79	Cadet quartermaster's department	6,714.06
Invested in United States bonds	20,000.00	Cadet subsistence department	1,944.77
Cash on hand in office safe	3,496.42	Corps of cadets	12,176.04
		Deposits	225.00
		Dialectic society	24.35
		Equipment fund	28,750.00
		Miscellaneous fund	17.97
Total	54,371.58	Tota	54,371.58

The following statement of receipts and disbursements under each account exhibits the totals of such between May 16, 1892, the date of the last statement, fiscal year 1891–'92, and May 15, 1893, the date of the last statement prepared in this office prior to June 30, 1893, six bimonthly statements having been made during the year, namely:

No.	Receipts.	Amount.	Disbursements.	Amount.
1	Assistant treasurer, check drawn	$145,797.88	Assistant treasurer (deposits)	$149,521.50
2	Balances paid	17,764.05	Balances paid	17,921.33
3	Barber	533.55	Barber	533.55
4	Cadet cash	10,498.16	Cadet cash	10,596.16
5	Cadet hospital	1,961.51	Cadet hospital	1,778.54
6	Cadet laundry	6,680.91	Cadet laundry	6,920.19
7	Cadet quartermaster's department	72,751.09	Cadet quartermaster's department	69,131.34
8	Cadet subsistence department	54,870.45	Cadet subsistence department	55,760.67
9	Confectioner	452.00	Confectioner	452.00
10	Corps of cadets	177,795.85	Corps of cadets	178,590.47
11	Damages, ordnance, and stoppages	13.50	Damages, ordnance, and stoppages	13.50
12	Dancing	600.00	Dancing	600.00
13	Dentist	539.00	Dentist	674.00
14	Deposits	16,985.20	Deposits	16,785.20
15	Dialectic society	450.33	Dialectic society	447.83
16	Equipment fund	12,720.00	Equipment fund	13,370.00
17	Expressage	32.84	Expressage	32.84
18	Gas fund	1,252.31	Gas fund	1,252.31
19	Hops and germans	1,668.36	Hops and germans	1,668.36
20	Miscellaneous fund	6.55	Miscellaneous fund	
21	Miscellaneous items	1,105.74	Miscellaneous items	1,064.95
22	Oaths	30.15	Oaths	30.15
23	Paymaster	149,521.50	Paymaster	149,521.50
24	Periodicals	73.42	Periodicals	73.42
25	Photographer	84.00	Photographer	84.00
26	Policing barracks	5,599.55	Policing barracks	5,599.55
27	Athletic Association	326.25	Athletic Association	279.81
28	Young Men's Christian Association	31.80	Young Men's Christian Association	16.86

It will be observed that accounts 3, 9, 11, 12, 17, 18, 19, 22, 23, 24, 25, and 26 appear and disappear in the above statement, no balances being carried. This is the case because only such sums are charged the cadets proportionally as will settle the indebtedness necessarily incurred in connection with each object denoted by the name of the account. From this statement it will be seen that cadets expended during the year, for the purposes indicated in the following list, Table No. 1, the sum set opposite each account. These sums can be compared with the expenditures for the same objects during the fiscal year 1891–'92, as shown in Table No. 2:

Table No. 1.	Amount.	Table No. 2.	Amount.
Hair cutting	$533.55	Hair cutting	$540.25
Confectionery	452.00	Confectionery	316.00
Dentistry	674.00	Dentistry	954.00
Expressage	32.84	Expressage	44.20
Gas	1,252.31	Gas	1,255.90
Hops	1,668.36	Hops	1,641.17
Oaths	30.15	Oaths	24.00
Periodicals	73.42	Periodicals	92.00
Photographs	84.00	Photographs	54.00
Policing barracks	5,599.55	Policing barracks	5,866.63
Athletic Association	279.81	Athletic Association	
Support cadet hospital	1,961.51	Support cadet hospital	1,928.61

The cost of toilet paper used in cadet sinks, candles consumed in camp (in 1892) blacking, blacking brushes, and matches is included in the sum charged against policing barracks, as well as the pay roll of the men employed in policing barracks, which latter amount was for the year $4,920.

The following is the statement of the treasurer at date, May 15, 1893, the last inspection of his accounts prior to end of the fiscal year:

Assets.		Liabilities.	
Assistant treasurer	$34,557.99	Athletic Association	$222.75
Balances paid	157.28	Cadet hospital	182.97
Cadet cash	98.00	Cadet laundry	4,280.11
Dentist	135.00	Cadet quartermaster's department	10,333.81
Trust fund	20,000.00	Cadet subsistence department	1,054.55
Cash on hand	873.65	Corps of cadets	11,381.42
		Deposits	200.00
		Young Men's Christian Association	14.94
		Dialectic society	26.85
		Equipment fund	28,100.00
		Miscellaneous fund	24.52
Total	55,821.92	Total	55,821.92

The amount of the equipment fund as given above was reduced because of settlement with this year's graduating class by the sum of $9,558. The experiment tried this year of settling the accounts of graduates prior to date of graduation worked exceedingly well, and the plan will be pursued in future.

CADET QUARTERMASTER'S DEPARTMENT.

During the year ending June 30 last the department manufactured for cadets—

Dress coats	333	White trousers	1,096
Overcoats	175	Gray flannel trousers	138
Blouses	413	Tennis trousers	27
White jackets	279	Gray riding trousers	57
Gray trousers	624		

During the same period there were manufactured for officers, graduates, and furlough men—

Blouses	3	Riding trousers	0
Dress coats	1	Civilian coats	12
Uniform trousers	35	Civilian vests	15
Capes	1	Civilian trousers	24
Overcoats	1		

There were repaired during the year—

Dress coats	298	Civilian suits	49
Overcoats	285	Pairs of gloves	695
Blouses	647	Pairs of socks	2,845
Trousers	2,613	Pairs of shoes	1,373

Year before last the business of the store was conducted on the following basis: Seven per cent was added to the face invoice of supplies, the discounts arising from cash payments accruing to the store. Under this charge the fund increased.

Inasmuch as it is the intention to charge only such percentages as will pay the running expenses of the store, viz, the charges for salaries of cutter, clerks, janitor, driver of wagon, policewoman, and freight charges, the manner of transacting the business was changed to the following basis, viz:

All discounts received because of spot cash payments were deducted from the face of the invoice and 4 per cent was charged on such reduced amount.

The fund on this basis diminished $1,013.48, or from $43,789.46 to $42,775.98, which was the value of the cadet quartermaster's department fund June 30 last, consisting of supplies and money.

I recommend that during the present year the business be conducted on the following basis, viz, add 4 per cent to the face invoice of supplies.

This matter of charges is one which must be adjusted from year to year, since whilst the running expenses are fixed, or nearly so, the value of the fund varies according to the amount of business done. One year ago the prices of the following articles of clothing were reduced as follows:

Dress coats from	$16.75 to $15.43
Overcoats from	22.75 to 21.40
Blouses from	13.32 to 12.04
Gray trousers from	6.96 to 5.92

The diminution of the fund by $1,013.48 is partly due to this reduction in prices. If my recommendation to charge 4 per cent on the face value of the invoice is approved the above articles will be charged at the following prices, viz:

	Cents.
Dress coats, $15.90, increase of	47
Overcoats, $22.36, increase of	39
Blouses, $12.40, increase of	36
Gray trousers, $6.15, increase of	23

The plan adopted this last year of manufacturing for the incoming fourth class prior to its arrival all articles of clothing on old cadets' average measurements worked most satisfactorily and secured the complete outfitting of the class in a shorter period than the work was ever before accomplished, and the same plan will be carried out in future.

CADET SUBSISTENCE DEPARTMENT.

The cadet mess hall, the kitchens, bakery, and dormitories are all in good condition. The average daily cost of subsistence per cadet during the year was 52.22 cents, an increase over the cost the year previous of 2.62 cents per day, due to the increased

cost of supplies. In my report for the fiscal year 1891–'92, I gave a minute and detailed account of the manner in which the affairs of the mess are conducted; and, therefore, omit any reference to the same at this time.

The cadet garden is not so good a one as was the old garden, the territory of which was taken for the extension of the post cemetery; however, it is improving from year to year. I invite attention to the fact that the southern boundary of the reservation has no wall or fence to protect it and the reservation from the incursion of cattle belonging to the citizens of Highland Falls. In obedience to the instructions of the Superintendent, the manure pile formerly located in front of the gardener's quarters is being removed to the rear of the same. I recommend that the present front entrance to the grounds be walled up; that an entrance to them from the back road in rear of gardener's house be made, using the gate now used in front; that the interior stone wall which divides the territory in front of the gardener's house into two lots be removed, and that the stones of which it is composed be placed on the outer wall running from the crossroads northwesterly. (This last wall is in some places lower than the road. The removal of this wall will give one large lot, which can be set in grass.) That the building at the garden be given a coat of paint.

These things having been done, the locality will be greatly improved.

Inasmuch as there is no appropriation for these improvements, I respectfully request that the same may be executed by the post quartermaster, he employing his teams and the men of his detachment to do the work.

CADET LAUNDRY.

The laundry building and machinery are in good condition. The following articles were laundried during the year:

Clothes bags	4,774	Collars	97,194
Sheets	22,953	Shoulder belts	17,343
Pillow cases	16,346	Waist belts	17,930
White shirts	22,716	Sword belts	2,543
Nightshirts	13,972	Gray trousers	397
Undershirts	43,978	Gray jackets	126
Drawers	43,590	Blankets, single	373
White trousers	47,188	Comfortables	96
White jackets	3,170	Bathing suits	127
Towels	76,106	Vest	1
Socks, pairs of	40,892	Articles from cadet hospital	4,082
Gloves, pairs of	38,461		
Handkerchiefs	83,965	Total	640,993
Cuffs, pairs of	42,670		

An excess over the number of articles laundried last year, exclusive of the work done for the cadet hospital, of 128,746 pieces. I am of the opinion that this increase is due to the fact that the laundry charges are proportional.

Respectfully submitted.

WM. F. SPURGIN,
Captain Twenty-first Infantry, Treasurer U. S. Military Academy, Quartermaster and Commissary of Cadets.

A true copy.

J. M. CARSON, JR.,
First Lieutenant Fifth Cavalry, Adjutant.

E.

WEST POINT, N. Y., *September 4, 1893.*

The ADJUTANT U. S. MILITARY ACADEMY:

SIR: In accordance with instructions, I have the honor to submit the following report of the principal operations in the department of ordnance and gunnery at the U. S. Military Academy during the fiscal year ending June 30, 1893:

* * * * * * *

In the machine shop the following full-size wood models of projectiles have been made for use in the instruction of cadets and for the ordnance museum:

Two models 12-inch mortar shell, two models 12-inch solid shot, two models 10-

inch solid shot, two models 8-inch solid shot, two models 5-inch shell, two models 3.6-inch shell, two models 3.2-inch shell, two models 3.2-inch shrapnel; total, 16. These have been lettered, lacquered, and prepared for use.

The Thurston testing machine has been repaired and made ready for use.

A number of sample boards for small-arm cartridges have been prepared, showing the different steps in the manufacture of the small-arm ammunition.

A large quantity of old zincs on hand have been remelted and recast for use with the gravity batteries at the instrument house.

A large quantity of stores belonging to the museum have been cleaned, packed, and shipped to the World's Fair at Chicago, authority therefor having been given by the proper authorities.

A platform for the Hotchkiss rapid-fire gun has been built and laid at the ordnance firing ground; a cabinet for copper cylinders for crusher gauge, and a powder case for samples of powder made for the section room; also rests for star gauges for use in practical instruction; and repairs to bier which is used on the artillery caisson at funerals have been made; fencing muskets for the gymnasium have been stocked; models of rifling and boring tools made, and the boat belonging to the department and used in placing the targets, etc., repainted.

The barrack room and exterior woodwork of buildings have been painted, also the instrument and firing houses, and the ballistic pendulum house at the north dock.

The brick pavement at instrument house has been relaid, two new 8-inch barbette carriages assembled at the seacoast battery, the materials for mechanical maneuvers overhauled, cleaned, and repaired, the 15-inch gun carriages repaired, and covers made for all the machine and rapid-fire guns. Drawings have been made, for use in the section room, of all the more complicated materials referred to in the course of instruction, and this work is still in progress. Also drawings have been made of all the parts of the breech mechanism of the different machine and rapid-fire guns in the possession of the department, for the use of cadets in dismounting and assembling these guns in the course of practical instruction.

The lithographic plates required in the text-book on exterior ballistics and gun construction have been prepared, printed, and bound with the book.

The wires at the instrument house have been rearranged and drawings made showing their arrangement in detail.

This work is still in progress.

The models and projectiles belonging to the museum and stored in the basement of cadet barracks have been moved and arranged in order.

MUSEUM.

When the old academic building was torn down in June, 1891, it became necessary to remove and store temporarily the articles belonging to it. The projectiles and some of the models were stored in the basement of cadet barracks, the trophy flags in the attic of the east building at the ordnance laboratory, and the arms and remaining models in the attic of the west building. As stated previously, some of these stores were shipped to Chicago for exhibition at the World's Fair. Two regimental and one national color belonging to the Sixth United States Infantry have been asked for by the colonel of that regiment, and their transfer to him has been approved by the honorable Secretary of War.

A number of articles have been received for the museum, among them a Jarmann gun, caliber .399, which was presented by Gen. Otto Nyquist, aid-de-camp to His Majesty, the King of Sweden; the epaulettes of Gen. Totten and the inkstand of Gen. Cullum, both presented by Col. Craighill, U. S. Corps of Engineers.

As soon as the new academic building is completed and the room for the museum available, it is believed that many valuable additions will be made to the already large collection of the Academy.

ADDITIONS TO ARMAMENT.

During the year the ordnance department has supplied the gun carriages, limbers, and caissons complete for a new 3.20 field battery. The guns were already on hand, but were mounted on old wooden 3-inch carriages, and the battery could only be used for foot drill.

The new carriages are of the latest light pattern steel, and the old battery with heavy carriages is used for foot drill. As soon as they are available it is intended to replace the heavy carriages with light ones.

There are at present two complete field batteries of six guns each, 3.20 inch, at the Academy, and the field armament is complete.

Requisitions have been made for an Easton and Anderson carriage for the 12-inch

steel-hooped breech-loading mortar, and it is believed that the carriage will soon be delivered here.

The appropriation for the construction of the platform was made by the last Congress and is now available.

The 12-inch mortar is here ready for mounting. A requisition has also been made for an 8-inch barbette carriage for the 8-inch steel breech-loading rifle. It is believed that this carriage will be ready during the present year, and the money for its platform is also available.

The gun can be obtained at any time. Three new front pintle barbette carriages for 8-inch converted rifles will be procured as soon as platforms can be provided for them. They are intended to replace the present obsolete carriages in the seacoast battery, the two 8-inch converted rifles to be mounted on them, to replace the present 10-inch Rodman smoothbore and 300-pounder Parrott, are already here.

The money for these platforms is now available. Four 5-inch siege guns and two 7-inch howitzers with their carriages have been asked for to fit out the siege-gun battery. The delay in receiving them is due to the carriages, but they should be ready at an early date.

A Maxim automatic machine gun and a Nordenfelt rapid-fire gun have been ordered from the manufacturers.

They are now making the machine gun, drawings of the chamber having been sent them, and they should be received in the next few months. A Driggs-Schroeder rapid-fire gun has been estimated for in the annual estimates this year. It is hoped that the department may be enabled to obtain each year a sample of the leading machine and rapid-fire guns of the world for the benefit of cadets and as an addition to the museum.

SMALL-ARMS AND AMMUNITION.

As soon as the manufacture of the new small-caliber rifle shall have progressed sufficiently at the National Armory it is intended to obtain samples of the gun in its various stages of manufacture, and also of its ammunition, for purpose of instruction and for the museum.

MODELS.

An appropriation was made by the last Congress for the manufacture of models of guns of the field, siege and sea-coast service. These models are now being made at the Watervliet Arsenal. They are intended to show on a reduced scale the gun and its mechanism complete, and will be very valuable for purposes of instruction and as an addition to the museum. A further estimate has been submitted this year for funds to complete these models and to make models of all the carriages belonging to them.

During the year there have been obtained from the Frankford Arsenal various models of the service shrapnel, cartridges, primers, etc.

From the American Projectile Company, Boston, Mass., samples of electric-welded projectiles of their manufacture, which they very kindly furnished without cost to the department; also samples of the Hotchkiss ammunition, furnished similarly by the Hotchkiss Company.

The models of all the service projectiles, full size in wood, have been made here, the material being furnished by the Ordnance Department.

BALLISTIC INSTRUMENTS.

A new Breger chronograph, made by Queen & Co., of Philadelphia, has been purchased, and the old Schultz chronoscope altered by the same firm, replacing to spark and coil by Marcel Deprez registers. These registers are now on exhibition at the World's Fair. There are thus four good ballistic instruments belonging to the department, and greater facilities than ever before are extended to cadets to become familiar with the working of these instruments. In addition to this the Ordnance Department is now making four rifled barrels fitted with crusher gauges for use with these instruments, and independent targets are being arranged by which all the instruments can be used.

The mercury densimeter has been repaired and is now used in the determination of the specific gravity of powder.

I have no recommendations or suggestions to make.

Very respectfully, your obedient servant,

LAWRENCE L. BRUFF,
Captain, Ordnance Department, U. S. Army,
Instructor of Ordnance and Gunnery.

A true extract.

J. M. CARSON, JR.,
First Lieutenant, Fifth Cavalry, Adjutant.

F.

WEST POINT, N. Y., *September 11, 1893.*

The ADJUTANT, U. S. MILITARY ACADEMY,
West Point, N. Y.:

SIR: Complying with the requirements of Circular No. 35, Headquarters U. S. Military Academy, West Point, N. Y., August 26, 1893, I have the honor to submit the following report concerning the operations of the department of practical military engineering for the year ending August 31, 1893:

* * * * * * *

WATER SUPPLY AND PIPE LINE.

During the short but extreme drought of the summer of 1893 the water level of Round Pond fell so low as to cause anxiety for a time. The season was most favorable for a test of the water supply under the present conditions of storage. During November, 1892, Round Pond was drawn down to 11.5 feet, the lowest level for the year. The water continued to rise during the winter and spring until, on April 6, 1893, it reached 18 feet, the level where loss begins to take place by leakage through the dam. The unusually high reading of 19 feet was recorded on May 4, 5, and 6, 1892, being about half a foot above the crest of the spillway. Without any draft through the siphon the level fell so as to record 17.9 feet on June 9. On June 19 the level of 18 feet was again reached and maintained until the drought began on July 1. The level fell steadily to 13.6 feet on August 23, the last day of drought during the year under consideration.

For the purpose of study the average monthly gauge readings at Round Pond have been plotted for the whole period during which they have been kept; that is, from October, 1880, to August, 1893, inclusive. A tracing showing the resulting curve is sent herewith, marked B. It shows conclusively that the existing means of water storage must be largely supplemented if the danger of a water famine is to be averted.

After fully considering the subject I am of the opinion that a new reservoir should be formed at the site previously adopted, viz, the hollow south of Fort Putnam. An appropriation having been made for this purpose explorations for a site for a dam have been under way for several months. The work has been delayed by want of suitable plant and by difficulty in procuring good laborers, but is now almost completed. The indications are that, owing to the character of the ground and the scarcity of suitable material for an earthern dam, a structure of that kind is not to be recommended, but that a masonry dam should be built instead. The whole question is receiving careful study and will soon be made the subject of a special report.

The existing reservoirs are not in good condition, and in my annual estimates I submitted an item of $25,000 for making substantial improvements in this respect. The dams in several instances need strengthening and raising, while the reservoirs and their watersheds are in need of cleaning to improve the condition of the water. The leaks in the dam at Delafield Pond are well known to need attention. The Crownest dam requires repointing. The Cascades dam should be tightened, and the existing crude intake replaced by a suitable one. The dam at Round Pond can be raised and tightened to advantage, as was clearly shown during last spring, when considerable excellent water was lost by overflow and leakage. The Sinclair Pond dam needs strengthening, and the existing wooden spillway, located about the middle of the dam, should be replaced by a masonry structure, placed in the natural bank.

The pipe line has rendered excellent service, and has needed only routine repairs.

New roofs have been placed on the water house, the filter house, and the Delafield Pond gate house. Slight repairs have been made to the siphon house at Round Pond. Surveys pertaining to the proposed new reservoir are in progress.

* * * * * * *

Very respectfully,

JAS. L. LUSK,
Captain, Corps of Engineers,
Instructor Practical Military Engineering.

HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., September 20, 1893.

A true extract.

J. M. CARSON, JR.,
First Lieutenant, Fifth Cavalry, Adjutant.

G.

QUARTERMASTER'S OFFICE, U. S. MILITARY ACADEMY,
West Point, N. Y., September 11, 1893.

The ADJUTANT, U. S. MILITARY ACADEMY,
West Point, N. Y.:

SIR: I have the honor to submit herewith the following report of the operations of the Quartermaster's Department at West Point, N. Y., for the fiscal year ending June 30, 1893, prepared in accordance with instructions from your office, dated August 26, 1893:

QUARTERMASTER'S DEPARTMENT, U. S. ARMY.

The duties pertaining to this department consist in providing fuel, forage, and straw for the public animals and for officers' private horses; stoves for heating part of the officers' and enlisted mens' quarters; means of transportation by land and water for troops and animals; in furnishing the animals required for artillery, cavalry, and draft purposes, and in procuring and distributing clothing and equipage for the command.

The following appropriations have been drawn upon either for funds or supplies in order to meet the demands made upon the department:

Appropriation for regular supplies.—No allotment was made, but funds were furnished as necessity demanded, and were expended in the payment under formal contracts for fuel, forage, and straw, and stores required for sale to officers, and for issue.

Appropriation for incidental expenses.—An allotment of $10,500 was made, and in addition thereto the sum of $113.63 for various purposes. Of this amount $10,493.63 was expended in payment for services rendered by civilian clerks, extra-duty pay to enlisted men, and $120.38 for purchase of miscellaneous supplies and services.

Appropriation for Army transportation.—No allotment was made under this head, but funds were supplied as necessity demanded and were expended in the payment of mechanics, teamsters, transportation of funds, and $660 for the purchase of four draft animals. The department was, on requisition and quarterly estimates, provided under this appropriation with means of transportation, such as wagons, carts, harness, and materials for the repair of same, etc.

During the fiscal year there has been shipped 98,728 pounds of freight and transportation furnished, by rail and water, for 501 persons and 42 horses.

Appropriation for clothing and equipage.—No allotment of funds was made under this head of appropriation with the exception of $5 for inserting new linings in cape of overcoat, but clothing and equipage required by the command were furnished from depots of the Quartermaster's Department upon proper estimates and issued to troops upon approved requisitions.

The amounts received, disbursed, etc., under the various heads of appropriation were as follows:

Received from the Quartermaster-General of the Army:	
Regular supplies	$33,569.19
Incidental expenses	10,613.63
Army transportation	4,826.20
Clothing and equipage	5.00
	49,014.02
Received from sales to officers	4,485.50
Received from sales at auction	278.10
Total	53,777.62
Disbursed, etc.:	
Regular supplies	33,449.26
Incidental expenses	10,609.88
Army transportation	4,686.10
Proceeds of sales	4,763.60
Outstanding debts	127.68
Unexpended balances to be deposited	141.10
	53,777.62

Formal contracts for furnishing fuel, forage, and straw were entered into as follows:

With: James Weyant, June 8, 1892, 250 cords hard wood.
Ward & Olyphant, June 8, 1892, 1,900 tons anthracite coal.
John Noonan, July 22, 1892, 190,000 pounds oats.
Charles L. Rickerson, July 22, 1892, 110 tons hay.
Charles L. Rickerson, October 19, 1892, 680,000 pounds oats, 95 tons straw.
Thomas Shephard, October 19, 1892, 420 tons hay.
William E. Dante, October 20, 1892, 15 tons middlings, 15 tons shorts.
William Lewis, June 15, 1893, 150 cords hard wood.

The demands made upon the Department for services of mechanics and laborers warrants me in recommending that the present enlisted working force, known as the detachment of army-service men, Quartermaster's Department, be increased from 117 to 150 men, for the following reasons:

The authorized strength of the detachment of army-service men, quartermaster's department, is 117 men. Of this number there are at present 63 men who are daily available for work in the quartermaster's department: 21 mechanics, 18 laborers, 18 teamsters, and 6 overseers, the remainder performing various other duties that render them unavailable for purposes of policing and repairs at the post. The work to be performed, both police and mechanical, has increased of late years with the growth of the post, but the detachment, with the exception of an increase of seven men, has remained the same for the past ten or twelve years, and this increase was offset by the transfer of certain special-duty men. The buildings of the post have increased thirty-seven in number during the same period. The sewer, water, and gas pipes have been extended to meet the new additions, and have to be kept in good order. The new buildings are scattered and the police work is thus increased at least 20 per cent. The purchase of the Kinsley estate necessitates the care of more roadway and adds two more buildings to the repair list. The telephone system adds two more men to the list of those on special duty. The introducing of power machinery in the quartermaster's workshops requires the services of one man as engineer and the enlargement of the quartermaster's storage buildings requires the services of an extra man, adding two to the list of special-duty men. The number of printers in the headquarters printing office has been increased from three to four, adding one to the special-duty list. One man employed at the post exchange adds another to the list on special duty. The addition of quarters of officers and enlisted men has necessitated the increase of laborers and teamsters delivering fuel and necessary policing. The system of advertising for all supplies, and the clerical work consequent thereupon, has necessitated the increase of the number of clerks employed previously to double the number, adding two men to the special-duty list.

On completion of the academic building there will have to be supplied three or four janitors in addition to those who were in the old academic building.

Upon completion of the enlargement of the gas plant the present force of men employed at the gas works will have to be increased by the addition of four, at least.

The changing of the former style of privies to earth-closets will require the services of two additional men as scavengers.

The average number of men who can avail themselves of a furlough under the provisions of paragraph I, General Orders, No. 80, Adjutant-General's Office, series of 1890, is about six, thereby reducing the working force by that number for a period of three months, provided all take advantage of the order. Consequently the actual strength present will average only about 112.

The present enlisted working force is not, in my opinion, sufficiently large to keep the buildings and grounds of the post in proper order and at the same time furnish the details required by the several offices and the academic departments.

The detachment on June 30, 1893, was employed as follows:

Available for work in the quartermaster's department:		
Overseers	6	
Skilled mechanics	21	
Laborers	18	
Teamsters	18	
		63
Otherwise employed:		
Clerks in quartermaster's office	4	
Messenger and janitor in quartermaster's office	1	
Cooks in detachment mess	3	
Warehouseman in quartermaster's storehouse	1	
Clerk to adjutant	1	
Printers	4	
In post exchange	1	
In subsistence storehouse	4	
In U. S. Military Academy library	2	
Mail carrier	1	
Policemen	2	

Otherwise employed—Continued.		
School teacher	1	
At reservoirs, water-supply system	2	
Janitors, academic building	2	
On telephone system	2	
Watchmen; 1 at north dock, 1 at south dock	2	
In charge of grounds and greenhouse attached to quarters assigned for use of Superintendent U. S. Military Academy	1	
Care of post cemetery	2	
Gardener, detachment garden	1	
In gas works	6	
In academic departments	6	
	—	49
To which add:		
Absent with leave	1	
Vacancies	4	
	—	5
Total		117

The present number of draft animals authorized for the quartermaster's department at this post is insufficient, and, for reasons stated above, an increase of from 37 to 45 is considered necessary to meet demands.

QUARTERMASTER'S DEPARTMENT OF THE U. S. MILITARY ACADEMY.

My duties in this branch are defined in paragraph 12 of the U. S. Military Academy Regulations.

Contracts entered into by me during the year and those made in previous years and remaining in force in the fiscal year to which this report relates were as follows:

Name of contractor.	Date of contract.	Amount.	Purpose.
J. E. and A. L. Pennock	May 18, 1891	$447,981.00	New academic building.
John Moore	Sept. 25, 1891	45,500.00	Completing new gymnasium.
Broun, Green & Adams	Apr. 13, 1892	200.00	Military Academy Register.
Ward & Olyphant	Aug. 29, 1892	14,820.00	3,300 tons anthracite coal.
Wm. McMeekin	Sept. 1, 1892	1,200.00	Roof wing, quarters No. 39.
Narragansett Machine Co	Sept. 27, 1892	951.77	Delivery gymnasium outfit.
Cassidy & Son Manufacturing Co.	Oct. 27, 1892	2,080.00	160 pendants, cadet barracks.
Jeremiah J. Kennedy	Feb. 22, 1893	41,993.00	Enlarging gas works.
Wm. McMeekin	Apr. 24, 1893	23,447.00	New cadet sinks, etc.
David S. Wells	June 6, 1893	8,102.00	1,900 tons anthracite coal.
Do	June 24, 1893	734.25	75 tons cannel coal.
A. S. Swords & Co	...do	13,871.00	3,300 tons anthracite coal.
Westmoreland Coal Co	...do	4,548.00	1,200 tons gas coal.

Under contracts above named the following buildings were completed and improvements made in the year, viz:

New gymnasium; roof of wing of quarters No. 39; 160 two-light pendants, with slide lights in cadet barracks.

The following buildings are in course of erection:

New academic building, new sinks and bathrooms for cadets, new gas works, new boiler house, under contract dated July 7, 1893.

The following is an exhibit of my money accountability during the year·

Exhibit showing receipt, disbursement, etc., of funds pertaining to appropriations for the support of the U. S. Military Academy during the fiscal year ending June 30, 1893.

	Current and ordinary expenses.	Miscellaneous items and incidental expenses.	Buildings and grounds.	New academic building.	New gymnasium.	Total.
On hand July 1, 1892:						
Appropriation 1890				$37,012.71	$39,993.25	$77,005.96
Appropriation 1891	$3,662.42	$1,886.26	$8,571.72			14,120.40
Appropriation 1892	9,028.71	2,458.98	2,589.01			14,076.70
Received from Treasurer United States on approved estimates:						
Appropriation 1890				79,300.00		79,300.00
Appropriation 1891	172.38					172.38
Appropriation 1892	90.00					90.00
Appropriation 1893	65,511.25	22,020.00	64,000.00			151,531.25
Appropriation 1893–'94	600.00		4,150.00			4,750.00
Deficiency 1893	2,000.00					2,000.00
Total	81,064.76	26,365.24	79,310.73	116,312.71	39,993.25	343,046.69
Unexpended balances deposited to credit of Treasurer United States:						
Appropriation 1891	3,327.32	1,886.26	453.68			5,667.26
Appropriation 1892		.15	.90			1.05
Deposited to credit of Treasurer United States:						
Appropriation 1892	4,511.12	474.53	61.02			5,046.67
Disbursed during the year:						
Appropriation 1890				105,158.78	27,751.59	132,910.37
Appropriation 1891	511.48		8,118.04			8,629.52
Appropriation 1892	3,635.95	1,886.72	2,527.09			8,049.76
Appropriation 1893	53,734.42	19,074.15	38,681.86			111,490.43
Appropriation 1893–'94			1,679.08			1,679.08
Deficiencies 1893	1,800.00					1,800.00
On hand June 30, 1893:						
Appropriation 1890				11,153.93	12,241.66	23,395.59
Appropriation 1892	971.64	97.58				1,069.22
Appropriation 1893	11,772.83	2,945.85	25,318.14			40,036.82
Appropriation 1893–'94	600.00		2,470.92			3,070.92
Deficiencies 1893	200.00					200.00
Total	81,064.76	26,365.24	79,310.73	116,312.71	39,993.25	343,046.69

GAS WORKS, U. S. MILITARY ACADEMY.

As director of the gas works I am charged with providing the necessary illuminating gas for the needs of the post. In order to properly light the buildings and grounds of the Academy Congress appropriated for the last fiscal year the sum of $5,000 for the purchase of gas coal, oil, candles, lanterns, matches, chimneys, and wicking for lighting the Academy, chapel, library, cadet barricks, mess hall, shops, hospital, offices, stables, and riding-hall, sidewalks, camp, and wharves. As the gas consumed costs more than the amount appropriated, all that which is consumed at places not enumerated in the act is sold at actual cost of manufacture with a small increase for contingencies which includes a portion of the deficiency above named, and, also, provides for contingent repairs which experience has shown to be necessary from time to time. The remainder of the deficiency is charged to cadets. They pay for gas at the rate of 35 cents per month for the time they are actually present. The sale of gas as above, of coke, coal tar, etc., constitutes a fund known as the "Gas Fund," which is expended under the direction of the Superintendent of the Academy in the purchase of additional gas coal when necessary, lime for purifying purposes, retorts, gas fixtures, and repairs of same, pay of labor employed in making gas, and such other expenditures as pertains to the gas-making plant of the Academy. During the fiscal year ending June 30, 1893, the receipts and expenditures pertaining to the gas fund were as follows:

Receipts:	
From sales of coke	$564.03
From sales of coal tar	543.00
From sales of gas to officers	2,407.39
From sales of gas to civilians	708.30
From sales of gas to Quartermaster's Department, U. S. Army	456.40

Receipts—Continued.	
From sales of gas to cadets in barracks	1,089.76
From sales of gas fixtures to cadets	169.79
From sales of old gas-pipe	43.00
Total	5,981.67
On hand July 1, 1892	143.03
	6,124.70
Expended during the year	5,580.29
Unexpended balance on hand June 30, 1893	544.41

Under the provisions of the act making appropriations for the support of the Academy, approved March 1, 1893, all proceeds from the sale of gas are to be paid into the post fund.

The old gas works, established in 1857 at a cost of about $7,500, originally occupied a one-story stone-building (date of erection and cost unknown) on the northern slope of the plain, near the ordnance laboratory. This building, 75 by 23 feet, with a one-story brick addition erected in 1886, 44 by 7 feet, embraced the retort room, the purifying room, and engine and boiler room. In the cellar were located the center seal, tar well, and washer. The condensing room, 17 feet 4 inches by 7 feet, occupied a brick addition erected in 1882 at a cost unknown. The gas fitting room, built in the same year, stood a few yards east of the original building. The gas holders are situated a few yards south of the retort room, with a capacity of 20,000 and 14,250 cubic feet, respectively. With the exception of the original building and the two gas holders, all the old works are being removed to make way for the new works, now being erected under the appropriation for the purpose contained in this year's appropriation bill These works are provided with an additional holder of 50,000 cubic feet capacity and with the most approved appliances for the economical making of gas, and they will be capable of yielding, if necessary, 125,000 cubic feet of gas every twenty-four hours.

Very respectfully,

W. H. MILLER,
Captain and Assistant Quartermaster, U. S. Army,
Disbursing Officer, U. S. Military Academy.

True copy.

W. H. MILLER,
Captain and Assistant Quartermaster, U. S. Army.

H.

WEST POINT, N. Y., *September 28, 1893.*

The SECRETARY OF THE ACADEMIC BOARD:

SIR: Due to the fact that engineer and ordnance officers, officers on detached service, officers at Forts Monroe, Leavenworth, and Riley, artillery officers on duty with light batteries, general and regimental staff officers, officers on duty at colleges, and graduates of less than four years' service, are not as a rule available, it is now difficult to secure good instructors for many of the subjects taught here. The result of these restrictions is to deprive the Academy in most cases of its highest graduates as instructors.

The law preventing the detail of a graduate as a professor or instructor within four years of his graduation was never recommended by the Academic Board, and works to the disadvantage of the institution here in many important branches.

Experience in the Army does not necessarily improve an officer's knowledge of subjects not of a purely military character. In many branches the sooner an officer returns the better teacher he makes. This is particularly the case in the departments of mathematics and modern languages. Within four years after graduation the best instructors in a class are in most cases secured for other important duties. It seems but just that the Academy should have the benefit of its best productions.

Referring to instructors at West Point, the Board of Visitors for 1872 remarks: "The Military Academy breeds in and in."

This is not only true of the Military Academy, but of all good conservative institutions of instruction. For an academy with a special object there is no one feature more essential than the continuous "breeding in and in," so to speak, but it is of equal importance that the "stock" should be kept good.

The late Prof. Church in referring to the claims of this Academy for its highest graduates as instructors remarked that it should be borne in mind that this Academy is the "goose that lays the golden eggs."

With a view of increasing the facilities for obtaining the best possible instructors for the Academy, I respectfully submit the following resolution for the consideration of the Academic Board:

Resolved, That the Academic Board respectfully recommend to the honorable Secretary of War the establishment of a rule giving, as far as possible, to the Military Academy precedence in the details of officers, and the repeal of so much of an act making appropriations for the support of the Military Academy for the fiscal year ending June 30, 1883, and for other purposes, as reads, "and hereafter no graduate of the Military Academy shall be assigned or detailed to serve at said Academy as a professor, instructor, or assistant to either within four years after his graduation."

Very respectfully, your obedient servant,

EDGAR W. BASS,
Professor of Mathematics, U. S. Military Academy.

HEADQUARTERS, U. S. MILITARY ACADEMY,
West Point, N. Y., October 5, 1893.

The above resolution was unanimously adopted by the Academic Board at its meeting of September 28, 1893.

J. M. CARSON, JR.,
First Lieutenant, Fifth Cavalry,
Adjutant, U. S. Military Academy, Secretary Academic Board.

THIRD REPORT OF THE BOARD OF ORDNANCE AND FORTIFICATION.

REPORT OF THE BOARD OF ORDNANCE AND FORTIFICATION.

BOARD OF ORDNANCE AND FORTIFICATION,
War Department, Washington, D. C., October 31, 1893.

The SECRETARY OF WAR:

In compliance with the provisions of the statute making appropriations for fortifications and for the armament thereof, etc., approved February 24, 1891, the Board of Ordnance and Fortification submits herewith, for transmission to Congress, its annual report for the year ending October 31, 1893.

The requirements of said statute are as follows:

Provided, That the Board of Ordnance and Fortification shall make an annual report to Congress, through the Secretary of War, on the first Monday in December in each year, showing the general operations of the Board, and shall give a detailed statement of all contracts, allotments, and expenditures made by the Board.

NEW LEGISLATION AFFECTING THE BOARD.

No new or special duties have been assigned to the Board by legislation during the year, with the following exceptions:

1. In the act making appropriations for the support of the Army for the fiscal year ending June 30, 1894, etc., approved February 27, 1893, the following provision occurred:

For manufacture of arms at the national armories, four hundred thousand dollars: *Provided*, That no part of this appropriation shall be expended for the manufacture of magazine rifles of foreign invention until such magazine rifles of American invention as may be presented for tests to the War Department within the next thirty days shall have been tested by a board of officers to be selected by the Secretary of War, which board shall report to the Board of Ordnance and Fortification on or before July first, eighteen hundred and ninety-three. If the decision of said board of officers shall be in favor of any American invention and shall also receive the approval of the Board of Ordnance and Fortification and the Secretary of War, then this appropriation, or such part thereof as the Secretary may direct, shall be expended in the manufacture of such American arm: *Provided further*, That if no such American invention shall be recommended by said board or receive the approval of the Secretary of War, this appropriation shall be applicable to the manufacture of the magazine arm recommended for trial by the board recently in session and approved by the Secretary of War: *Provided further*, That not more than sixty thousand dollars of money appropriated for the Ordnance Department in all its branches shall be applied to the payment of civilian clerks in said Department.

As the report of the board of officers selected by the Secretary of War was not "in favor of any American invention," this Board did not consider that any duty was devolved upon it by the foregoing provision except to transmit the report of the said board of officers to the Secretary of War, which was accordingly done.

2. Under the "act making appropriations for fortifications and other works of defense, etc.," approved February 18, 1893, the duty was imposed upon this Board to make allotment of the sum of $130,000 for the procurement and test of "one 12-inch elevating carriage of A. H. Emery's design," as follows:

"To enable the Board of Ordnance and Fortification to procure and test one twelve-inch elevating carriage of A. H. Emery's design of the several sums available for allotment by the Board of Ordnance and Fortification for experimental and other purposes under the several 'acts making appropriations for fortifications and other works of defense. for the armament thereof, for the procurement of heavy ordnance for trial and service, and for other purposes,' which several acts were approved September twenty-second, eighteen hundred and eighty-eight, March second, eighteen hundred and eighty-nine, August eighteenth, eighteen hundred and ninety, February fourth, eighteen hundred and ninety-one, and July twenty-third, eighteen hundred and ninety-two, and this act, all of which sums are hereby set aside to the extent necessary and made available and continued in force for this purpose; and the Secretary of War is hereby authorized and directed to contract, without advertising, with A. H. Emery for this carriage, and test it, the same to be built, erected, and tested for a sum not exceeding one hundred and thirty thousand dollars, which price shall cover the cost of the carriage erected, and including all the powder and projectiles necessary for its preliminary test by the contractor and the fifty additional rounds for proof, to be fired under the direction of said Board of Ordnance and Fortification and in the presence of the said Board and the inventor or his authorized agent, due regard being paid to the suggestions offered by him with regard to the making of such test; said price also to cover all such repairs, if any, as may become necessary to have the whole carriage in good working order after the test of fifty rounds for proof. It shall be constructed on the general plans put before the Board by A. H. Emery and described by him in his letters to the Board under dates of November sixteenth and December twenty-fourth, eighteen hundred and ninety-two, and January twenty-first, eighteen hundred and ninety-three."

In pursuance of this legislative direction the Board of Ordnance and Fortification did, on February 24, 1893, allot the sum of $130,000 "for the procurement and test of one 12-inch elevating carriage of A. H. Emery's design" from the sums available for allotment by the Board. On March 17, 1893, a contract was entered into by the Chief of Ordnance with the said A. H. Emery for the construction and test of the said elevating carriage in accordance with the aforesaid act of Congress.

3. By the said act, approved February 18, 1893, appropriation was made as follows:

Board of Ordnance and Fortification: To enable the Board to make all needful and proper purchases, experiments, and tests to ascertain with a view to their utilization by the Government the most effective guns, small arms, cartridges, projectiles, fuses, explosives, torpedoes, armor plates, and other implement and engines of war, and to purchase or cause to be manufactured, under the authority of the Secretary of War, such guns, carriages, armor plates, and other war materials and articles as may, in the judgment of the Board, be necessary in the proper discharge of the duty devolved upon it by the act approved September twenty-second, eighteen hundred and eighty-eight; to pay the salaries of the civilian members of the Board of Ordnance and Fortification, and for the necessary traveling expenses of said members when traveling on duty; for payment of the necessary expenses of the Board, including a per diem allowance to each officer detailed to serve thereon, when employed on duty away from his permanent station, of two dollars and fifty cents a day; and for the test of experimental guns and carriages procured in accordance with the recommendations of the Board of Ordnance and Fortification, one hundred and twenty-five thousand dollars.

The table of allotments accompanying this report will show the extent and purposes to which this appropriation has been heretofore allotted. Only one-third of the year for which it was appropriated has elapsed, and the remaining portion will doubtless be required before the expiration of the year.

APPROPRIATIONS AND ALLOTMENTS.

Pursuant to the act of February 24, 1891, requiring the Board to "give a detailed statement of all contracts,* allotments, and expenditures made by the Board," the Board attaches hereto an exhibit, marked Appendix A, showing such detailed statements of allotments and expenditures from October 30, 1892, to the date of this report. The following table exhibits the appropriations, allotments, and balances to October 31, 1892:

Table showing summary of appropriations and allotments made by the Board of Ordnance and Fortification from September 22, 1888, to October 31, 1892.

SUMMARY TO OCTOBER 31, 1892.

Appropriation.	Total appropriations.	Total allotments, expenditures, and reverting to Treasury.	Total balances on hand not allotted or expended.	Total allotments and expenditures from Oct. 30, 1891, to Oct. 31, 1892.
Fortification act Sept. 22, 1888	$3,972,000.00	$3,952,300.04	$19,699.96	$53,054.28
Army appropriation, Mar. 2, 1889	56,000.00	3,156.20		
		52,843.80		
Fortification act Mar. 2, 1889	1,233,594.00	1,194,819.00	24,775.00	24,000.00
Fortification act Aug. 18, 1890	3,832,935.00	3,665,750.20	181,184.80	346,679.20
Fortification act Feb. 24, 1891	2,290,803.00	2,160,320.78	130,482.22	19,867.78
Fortification act July 23, 1892	210,000.00	1,666.66	208,333.34	1,666.66
Grand total	11,595,332.00	11,030,856.68	564,475.32	445,267.92

Total allotments	$10,967,568.32
Total expenditures for necessary expenses of Board	10,444.56
Total turned into Treasury	443.80
Total reverting to Treasury by lapse of appropriation	52,400.00
Grand total	11,030,856.68
Appropriated prior to current year subject to allotment by the Board	$11,595,332.00
Appropriated by act of 1893, subject to allotment by the Board	125,000.00
Total appropriated to date, subject to allotment	11,720,332.00
Total allotted to date of last report	10,967,568.32
Total allotment since last report	544,076.05
Aggregate allotment to date	11,511,644.37
Total expended for necessary expenses of Board	18,407.44
Total turned into Treasury	443.80
Lapsed appropriations	52,400.00
Total amount allotted, expended, lapsed, etc.	11,582,895.61
Balance unallotted at date of this report	†137,436.39
Aggregate	11,720,332.00

A careful inspection of the table of allotments for the year, hereto appended, will afford a very good idea of the practical work of the Board which has resulted in the actual expenditure of money; but not at all of the multifarious subjects which come before it for consideration, examination, and recommendation.

* In view of the language of the statute, attention is called to the fact that no contracts are made directly by the Board, but are made by the Ordnance and Engineer Departments, upon recommendations of the Board, approved by the Secretary of War.

†Of this amount $47,665 is by law for specific purposes, leaving subject to allotment but $89,771.39 for general experimental work between now and the 1st of July next.

GENERAL OPERATIONS.

The general operations of the Board during the past year have, in the main, consisted in the supervision of the progress and completion of works and objects already allotted for by it, and in the carrying forward of new and experimental work in guns, mortars, carriages, mounts, powders, explosives, torpedoes, projectiles, and range and position finders; in testing these, and in acquiring by purchase or otherwise the most improved accessories of modern seacoast defenses.

In addition to these, the Board has had referred to it for examination and recommendation a great number of devices of a miscellaneous character and of every degree of merit or demerit. To all these the Board has given careful and painstaking investigation with reference to utilizing all that was really valuable.

STEEL FORGINGS FOR GUNS.

At date of last report the total forgings then estimated to have been provided for was seventy 8-inch, ninety-seven 10-inch, and fifty-nine 12-inch, leaving to be supplied forgings for thirty-two 8-inch, one hundred and twenty-five 10-inch, and one hundred and forty-four 12-inch guns on the basis of the recommendations of the Board of Fortifications and Other Defenses.

Since the date of that report, provision has been made under the act of 1893 for the following additional forgings: Nine sets 8-inch, seven sets 10-inch, eight sets 12-inch.

This will make the following numbers provided and required:

	8-inch.	10-inch.	12-inch.
Total required	102	222	203
Total actually provided for to date	79	106	67
To be hereafter supplied	23	116	136

Of the amounts expended for steel forgings $2,300,000 has been allotted by this Board, which includes nearly all the forgings delivered to this date. The specifications to which all forgings for guns are required to conform will be found in Appendix B to the first report of the Board.

The Board renews its recommendation that contracts be authorized for forgings for a type 16-inch gun, so that work may commence on the type gun as soon as the 16-inch machinery, already contracted for, shall be installed.

ARMY GUN FACTORY.

No allotments for the gun factory have been made by this Board during the past year; the expenditures have been made directly through the Ordnance Department; but as the factory was erected and the equipment of the north wing made under allotments by the Board, a brief statement would seem proper of the subsequent progress, in continuance and completion of former reports.

The machinery and equipment of the north wing and center of the factory is now complete, and that of the south wing is substantially complete except as to the machinery for the fabrication of the proposed 16-inch B. L. rifle, nearly all of which is contracted for, as the Board is advised.

It is expected that the equipment of the south wing, including the 16-inch machinery, will be about completed by July 1, 1894. When so completed the capacity of this wing will be fifteen 12-inch guns and three 16-inch guns annually; and the total capacity of the factory, as estimated by the Chief of Ordnance (see p. 8 of his annual report of 1892), will be twelve 8-inch, fifteen 10-inch, fifteen 12-inch, and three 16-inch guns, or forty-five high-power guns per annum.

It is anticipated that by the beginning of July, 1894, there will have been turned out the following number of guns: Thirty 8-inch, twenty-seven 10-inch, twelve 12-inch. As was expected, with experience and acquired skill the output of the factory increases from year to year, and the demand for the other elements of the system of defense, in the way of emplacements and mounts, in order to utilize the large expenditure for factory and guns, becomes increasingly urgent.

EXPERIMENTAL GUNS.

Considerable progress has been made during the past year in the completion of several experimental guns allotted for, and to be tested under the supervision of the Board.

The Woodbridge 10-inch wire-wound gun, which was described in the last report of the Board, is now completed, and is at the proving ground awaiting its test. It received its breech mechanism, which is of the slotted-screw form, and a modification of the standard ordnance type, also the finishing and rifling of the bore, at the Watervliet Arsenal.

During the year the Board made an allotment of $12,000 for completing the test of this gun to 300 rounds.

The Crozier wire-wound 10-inch B. L. rifle.—This gun is now nearly completed and the Board is advised that it will be finished and ready for test by January 1, 1894.

The Board made allotments to the amount of $46,000 for the construction of this gun, and $10,000 has also been allotted for the test of the same.

The Brown segmental tube wire gun.—This gun, constructed by a private corporation but mounted and to be tested under allotments made by the Board, was completed during the year, and is now at the ordnance proving ground at Sandy Hook undergoing test. The results thus far are understood to have been satisfactory. The gun is of 5 inches caliber and about 44 calibers in length. (For description see last annual report.) It is fitted with a special breech mechanism, the screw being continuous and requiring four revolutions of the handle. It has withstood some very heavy pressures and given some unusually high velocities. With a powder charge of 21 pounds of Leonard's smokeless powder, and a projectile of 60 pounds, a velocity of 2,874 foot-seconds was attained with a pressure of 46,600 pounds per square inch. It has been fired to date about 100 rounds, of which 79 rounds have been fired at the proving ground with pressures of from 40,000 to 50,000 pounds to the inch.

For the test of this gun the Board has made allotments as follows:

To fit up a carriage for testing gun	$300.00
For ammunition for testing gun	6,031.00
For pressure gauges	80.00
Total	6,411.00

The object of the present experiments is to test the system so far as it can be in so small a gun.

This gun is not presented for purchase by the Government, as it is too light for a seacoast gun, too heavy for a siege gun, and not suitable for a rapid-fire gun. To be able to judge satisfactorily of its merits in comparison with the other wire-wound guns, it should be of 10-inch caliber, and of the same general dimensions as the other wire-wound guns.

It is to be regretted that the dimensions of this gun are not such as to give a direct comparison between it and other guns of the same caliber, and, as stated in the report of the Board for 1892—

> The Board is not of opinion that the test of so small a caliber as 5 inches can be of any decided value in determining the merits of the system in the high calibers—say 10 and 12 inches—in which, if at all, it would be especially useful. There is no difficulty in obtaining sufficient strength in guns of as small a caliber as 5 inches, and any results obtained in a 5-inch gun would not be conclusive as to the larger calibers.

In case adequate appropriation be made at the coming session of Congress to warrant such action it is the intention of the Board to allot money for the manufacture of a 10-inch gun of this type, provided the further test of the 5-inch gun does not develop any radical defect in the system.

Haskell multicharge gun.—This gun is also approaching completion and ought to be ready for test during the coming year. Its design has been greatly modified since it was first undertaken. It is an 8-inch B. L. rifle of steel, with one principal chamber and two auxiliary chambers or pockets, designed for secondary charges and for augmenting the pressure and successively increasing the velocity of the projectile.

The original allotment for this gun was $55,000. The cost of the forgings was $25,164. The contract price for finishing and assembling was $28,900. Total, $54,064, leaving a balance of $936 of the allotment. January 21, 1893, Mr. J. R. Haskell, the inventor of the gun, requested permission to modify the plan of the gun by shrinking on a band over the chamber for greater strength, and the Board allotted a sum of $830.86 in addition to the unexpended balance of $936, making a total of $1,766.86 for such modification.

On March 14, 1893, the inventor submitted a request for an allotment to enable him to make further modification by shrinking on a second band, 24 inches in length, in front of the first band and back of the trunnions, at a cost of $640.60. As the Board desired to give the system a thorough test under favorable circumstances the request was granted. The actual cost proved to be $5.70 more than estimated. On September 2, 1893, Mr. Haskell requested a still further allotment of $415.60 for a third band to be shrunk on adjacent to the other two, so as to make the hooping practically continuous from the breech to the trunnion band, making a total cost thus far of $56,892.76.

The following table presents a comparison between this gun and the service models:

Gun.	Weight.	Cost.
	Tons.	
Haskell 8-inch multicharge gun	32	$56,892
8-inch B. L. rifle, service	14½	15,646
10-inch B. L. rifle, service	30¼	30,592
12-inch B. L. rifle, service	52	47,227

A comparison of power can not be made until after the gun is fired. It is recognized that the cost of experimental guns is necessarily greater

than subsequent duplications; but in this case the disproportion between the cost of the 8-inch Haskell multicharge gun and the standard 8-inch rifle is very marked.

The Haskell gun, when complete, will be 36 feet over all and the bore 50 calibers in length, relatively to its caliber the longest seacoast gun yet constructed in this country. It is built in sections, which are screwed together. The gun on account of its length and peculiar model may require a carriage especially designed for its test.

This gun was authorized by Congress as an experiment. Since its initiation much advancement has been made in the production of slow-burning powders, by means of which a result is obtained similar in principle and effect to the multicharge and by a much simpler construction. The practical test of the Haskell multicharge gun, now not far distant, will decide whether it possesses advantages which will compensate for the greater simplicity, strength, and cheapness of the single-charge built-up system.

Twelve-inch B. L. rifle, cast-iron, hooped and tubed with steel.—The test of this gun, for which purpose an allotment was made by the Board January 8, 1889, has been completed during the year.

The total number of rounds fired was 263, with charges ranging from 245 to 275 pounds, the chamber pressure being limited to 31,000 pounds per square inch. The projectile used was of about 800 pounds. Velocities were obtained from 1,728 to 1,750 feet per second at the muzzle, and a good degree of accuracy demonstrated. This cast-iron, steel-hooped, and steel-tubed gun antedates the era of steel built-up guns. It is practically an obsolete type, being inferior by 10,000 foot tons in muzzle energy, and greater in weight by 2 tons than the 12-inch steel B. L. rifle. This marks the advance of gun making in this country in the last ten years.

CONTRACT GUNS.

West Point foundry contract.—This contract for finishing and assembling eleven 8-inch B. L. rifles from forgings procured under the act of September 22, 1888, is progressing steadily and approaching completion. Nine of these guns are finished, seven of which have been delivered at Sandy Hook; two are ready for shipment, and the remaining two are expected to be completed during the present calendar year.

Hundred gun contract.—The contract with the Bethlehem Iron Company for the production of twenty-five 8-inch, fifty 10-inch, and twenty-five 12-inch guns is progressing favorably. The past year has been chiefly devoted to the creation of the necessary plant and its equipment. In the last report of the Board a description was given of the works of this company. The following additional report of progress is given:

The finishing shop consists of an extension of the large machine shop, forming part of the new forging plant erected several years since. The extension is 605 feet 6 inches long and of the same width and height as the original shop. This makes the total length of shop and extension 1,248 feet by 117 feet 6 inches wide outside.

The girders and tracks carrying traveling cranes in original shop have been extended throughout the entire length. One new 80-ton traveling crane to serve the extension is already in operation and another is being constructed. The finishing shop is provided with the same system of independent steam engines, shafting, tracks, heating apparatus, etc., as the original shop.

The assembling will be done in the building of the new tempering plant, which owing to its great height is well suited for the purpose. Additional crane facilities are being provided, and the work of preparation for assembling is now well advanced.

All of the hoop lathes and one of the 10-inch turning lathes required in finishing and assembling these guns have been received and some of them are in operation. The rest of the tools are at this date all due or overdue, except two 12-inch lathes, which are due December 1.

A large number of rough machined forgings for 8 and 10 inch guns have already been made and accepted as to the physical qualities. These include six complete sets of 8-inch forgings, upon which the work of finishing and assembling can proceed.

Good progress has been made in the preparation of special tools, including boring bars, bits, etc., required for the finishing of 8-inch guns, and five tubes, six jackets, eighteen hoops, and six trunnions have already been partially finish-machined.

The Board is advised that while the delivery of the first 8-inch type gun may be made sometime after the date named in the contract there is every reason to expect that in subsequent deliveries the contract requirements will be filled.

SERVICE SEACOAST GUNS.

The test of the type 8-inch, 10-inch, and 12-inch B. L. rifles turned out at Watervliet Arsenal has continued through the year with satisfactory results.

The 8-inch B. L. rifle has been fired in all 248 rounds, and has been used in the test of powders and projectiles, without developing any weakness or unfavorable features.

The 10-inch B. L. rifle has been put to successive uses in testing the pneumatic 10-inch carriage, and, later, the Gordon counterpoise carriage; and also in the testing of powder and projectiles. It has been fired in all 210 rounds, and has proved a most satisfactory high-power gun.

The type 12-inch B. L. rifle has been fired in all 92 rounds. It has been used in the testing of the 12-inch gun-lift battery, and its further test is in progress.

For power, for endurance, and for accuracy these guns have justified expectations, and proved most serviceable arms which we need not hesitate to place upon our new fortifications. Other types may be found in the progress of time which may excel these, but experimental firings at home or abroad have not yet demonstrated the existence of any better guns.

It has been estimated that at the end of the present fiscal year, June 30, 1894, the following number of these high-power guns will have been completed at the gun factory, to wit: Thirty 8-inch, twenty-seven 10-inch, and twelve 12-inch guns; total, 69.

The total number of service seacoast guns to be completed at the end of the year should be as follows:

	8-inch.	10-inch.	12-inch.
Finished and assembled at gun factory	30	27	12
Finished and assembled at West Point Foundry	11	.....	.....
Finished and assembled under contract Bethlehem Iron Works	2	1	.....
Total	43	28	12

12-INCH SEACOAST MORTARS.

The production and delivery of the forty-three *12-inch cast-iron steel-hooped B. L. mortars*, contracted for with the South Boston Iron Works, has been progressing favorably during the year, and twenty-three have already been delivered at the Government proving ground at Sandy Hook, of which five have been proved, and it is estimated that the entire forty-three should be delivered by the end of the present year. This will make seventy-three of this type of mortar then ready for mounting. Fifty-three of this type have been delivered at the proving ground, of which number thirty-five have been proved.

The permanent emplacements for these mortars are rapidly approaching completion, as they are not delayed, as in the case of emplacements for 8 and 10 inch guns, by the lack of an adopted type of carriage. This type of mortar has been thoroughly tested for endurance and accuracy, and found satisfactory. The type piece was fired 364 rounds before the test was completed.

ALL-STEEL 12-INCH MORTARS.

The test of the type 12-inch all-steel B. L. mortar has been continued during the past year, and it has now been fired 59 rounds without material injury. The firing will be continued by the testing board to whom it will be turned over. The cast-iron, steel-hooped mortar was designed for a maximum charge of 80 pounds of brown prismatic powder, with a shell of about 630 pounds weight.

The all-steel type above referred to was designed for a charge of 105 pounds of powder and a shell of 800 pounds. In order to test the two mortars for comparative results firings have been made with projectiles of the same weight and a powder suitable for both, with the following results, as given by the Chief of Ordnance in his annual report of 1892:

Kind of mortar.	Weight.	Length of bore.	Powder.		Weight of shell.	Muzzle velocity.	Pressure per square inch.	Range.
			Du Pont's brown prismatic.	Weight.				
	Tons.	*Calibers.*		*Pounds.*	*Pounds.*	*Ft. secs.*	*Pounds.*	*Miles.*
12-inch cast-iron steel-hooped	14.25	9	V. M....	80	800	1,020	27,500	5
Steel	13.	10	V. M....	105	800	1,145	30,000	6

While the advantage of the steel mortar in velocity, range, and power is very great, it is believed that its superiority in endurance would be equally marked.

By the fortification act of 1893 no money was appropriated for the construction of mortars. That act appropriated a gross sum of $700,000 to meet payments for a number of objects, including the equipment of the gun factory, the procurement of steel for 8, 10, and 12 inch guns; carriages for guns and mortars; and for "steel breech-loading, rifled seacoast mortars of 12-inch caliber," contracted for under the act of 1892. But no additional appropriation was made for mortars of either type beyond those already contracted for. This leaves the number of mortars already provided for as follows:

One type, 12-inch mortar, cast-iron, hooped with steel	1
First contract, with Builders' Iron Foundry, Providence	30
Second contract, with South Boston Iron Works, Boston	43
One type, 12-inch, all-steel mortar	1
Under act of 1892, all-steel mortars	7
Total	82

As the approved project of defense contemplates the use of 700 12-inch mortars of the two types described, which number will doubtless be ultimately increased to not less than 800, and as the defenses of New York Harbor alone will call for 176 of these, it will be seen that only a good beginning has been made in the fabrication of this effective weapon. As both these types of mortars have proved successful, and as the spring return carriage is satisfactory as a mount, and the emplacements present no especial difficulties, there appears to be no reason why this important element in harbor defense should not proceed rapidly.

GUN CARRIAGES AND MOUNTS.

12-inch gun-lift—During the year the 12-inch gun-lift battery at Sandy Hook has been completed, and the lift and mount tested in the presence of the Board on July 13, 1893.

The 12-inch B. L. rifle, steel, the first finished and assembled at Watervliet Arsenal, was fired from the Schneider carriage (constructed at Creusot, France) with 450 pounds brown prismatic powder, and a thousand-pound shot. The lift worked satisfactorily, and the carriage and lift stood the recoil well.

The estimated cost of this two-gun battery, with lift, is $457,000, of which $283,000 is for masonry and sand covering, and $174,000 is for the mechanism of the gun-lift. To this must be added the cost of one carriage, $19,899.25, and of the gun (placed at the figure estimated in accordance with the more recent contracts for forgings), say $47,227, and we have the total cost to date of the two-gun battery, $524,121.25; or when completed by the addition of the second gun and its carriage, $591,252.50. These figures relate to the type battery and will be considerably reduced in reproductions.

Two additional 12-inch gun-lift carriages are now under construction at the Watertown Arsenal.

THE EMERY 12-INCH ELEVATING MOUNT.

As will be seen from the act of February 18, 1893, quoted in part in the first portion of this report, Congress has provided by special legislation for the construction and test of an experimental 12-inch elevating carriage of the design of A. H. Emery. The design for this carriage, or mount, has not been made public pending the application of the inventor for patents, and by the act of Congress referred to "the inventor is at liberty to make any and all changes in the design and specifications for and the construction of this carriage at any time on or before the completion of the tests which he thinks are desirable for the utility and use of this carriage, or repetitions thereof, or which will facilitate the early completion and successful test of the carriage." So that it may be said that the design is not fully determined or known.

The mount, as designed and presented to the Board, is intended to give a perpendicular drop to the gun of 14 feet, to traverse through 360 degrees, and is claimed to be capable of lowering and raising several times without firing.

A site has been selected by the Chief of Engineers for the erection of the proposed mount in the line of defenses at Sandy Hook, where, if it shall prove successful, it may form a part of the permanent works, and a contract was made March 17, 1893, by the Chief of Ordnance with the inventor for its construction, to be ready for test within two years from the date of contract.

The Board is advised by the inventor, under date of October 20, 1893, that he has nearly completed his design, a patent for which has been allowed, and that he is now engaged upon the working drawings, and he expresses the hope that it may be up and ready for test during the coming year.

12-INCH MINIMUM-PORT CASEMATE CARRIAGE.

May 5, 1892, the Board made an allotment of $80,000 to apply on the purchase of an experimental casemate carriage for 12-inch B. L. rifle, and the right of manufacture in the United States, together with necessary detailed construction drawings of the same. As noted in last report this carriage was put under construction by contract with the Grusonwerk Company, of Magdeburg-Buckau, Germany.

This important experimental carriage has been completed and is expected to arrive at New York by the time this report is transmitted. The carriage has been tested by the manufacturers at the proving grounds of the Krupp-Grusonwerk Company, at Meppen, in the presence of a representative of the United States Ordnance Office. It is reported to have worked very satisfactorily.

Detailed drawings of this carriage, together with like drawings for the 8-inch and 10-inch carriages of similar design, were received by the United States Ordnance Office prior to the execution of the contract, and the right to manufacture carriages of this type for 8, 10, and 12 inch guns for the Government of the United States is included in the contract price for the carriage. This carriage, as its name implies, is designed for armored casemates. It is expected that it will receive its test during the coming year.

10-INCH PNEUMATIC CARRIAGE.

This carriage, the record of the test of which was presented in the last report of the Board, was turned over to the Chief of Ordnance for further firings with a view of determining whether the mechanism be suited to be operated in service without the assistance of experts. The 10-inch type gun was dismounted from the carriage when its test was completed by the Board in order that it might be used for other work.

In view of the anticipated early trial of the Crozier-Buffington disappearing carriage and of the modified Gordon counterpoise carriage the Board has recommended that the above-mentioned firings be postponed, at least till after the test of these two carriages be made.

THE GORDON 10-INCH COUNTERPOISE CARRIAGE.

This carriage, designed by Capt. W. B. Gordon, Ordnance Department, U. S. Army, the right to manufacture which has been given to the United States by the inventor, had been completed at date of last report and was being put in place at the Sandy Hook proving ground. It has since received its 10-inch gun, and has been partially tested.

The principal parts of the carriage were built by the Morgan Engineering Works of Alliance, Ohio. The total weight of the carriage, without the gun, is about 400,000 pounds. The entire mount consists of four principal parts: First, the top carriage; second, the main frame; third, four heavy double cranks journaled into the main frame, which connect the top carriage, supporting the gun with the counterpoise; and, fourth, the counterpoise.

The top carriage is of steel, triangular in form, not unlike the top carriage of the old style barbette mount. At the apex of this top carriage rest the trunnions of the gun, and with it is connected the elevating and depressing mechanism.

The main frame is of massive cast iron, and consists of a heavy bedplate supporting two ponderous side frames, through which are journaled the four double cranks, upon the inner and longer arms of which the top carriage is supported, and upon the four outer and shorter arms the heavy counterpoise frame is lifted when the gun recoils.

The four double cranks are journaled through the sides of the main frame, two on each side, and revolve freely upon these journals through an arc of about 180 degrees. When the gun is in firing position the crank arms are nearly vertical. When the gun is fired the top carriage, supported by the four longer crank arms, is carried backward and downward, describing the arc of a circle, until it rests folded closely down between the side frames, while the counterpoise, lifted by the lower and shorter crank arms, is swung upward and forward, through the arc of a smaller circle, and rests parallel and nearly level with the gun.

The counterpoise consists of a massive cast-iron frame, constructed outside of and around the main frame of the carriage, forming a loading platform in the rear, and a protection for the hydraulic cylinders, which are secured to the bedplate in front. This counterpoise is mounted upon the shorter and outer crank arms, which connect it with the top carriage.

Between the side frames, and resting upon the bed plate forward of the center of motion, are two hydraulic cylinders, upon and across the front ends of which is placed an air chamber or reservoir. Parallel connecting arms extend from the shafts, on which the four long crank arms are journaled to the top carriage, to a truck, running on tracks, on the bed-plate, which carries the piston rods, through which the energy of the recoil is stored by forcing the liquid in the hydraulic cylinders through check valves into the air chamber, where it is held in readiness to assist in again raising the gun into firing position.

When the Board witnessed the test of the carriage, on the 13th of July last, the recoil was even and easily taken up, but owing to defects in the air pump, afterward corrected, it failed to elevate promptly. On July 14 the Board made allotment of $1,000 for repairs. Since then, on September 14, the carriage was fired for rapidity, making ten rounds in fifty-eight minutes and twenty-eight seconds, the old air pump having been replaced by a better one.

Difficulty has been experienced in traversing the carriage, due to the inadequacy of the foundation and platform, but this difficulty, it is believed, can be readily overcome. As a whole, the Gordon carriage is simple, strong, and free from the objection of using extraneous power. Although it is too early to announce a final decision, it may at least be said that the system is one of great promise, and worthy of future development.

The total cost of this experimental carriage to date, with its foundation, together with repairs during its test, has been as follows:

February 12, 1890, for drawings of carriage	$75
October 4, 1890, for carriage complete, delivered and erected on foundation	57,500
August 3, 1891, for masonry foundations	2,400
July 14, 1893, for repairs during test	1,000
Total	60,975

In addition to this amount should be added the cost of the test.

The report of the Ordnance Board upon this carriage is appended, wherein will be found a fuller description of it, and also a detailed report of the firings from the carriage. (See Appendix B.)

For the purpose of ready comparison a table is here inserted, showing the relative times required in operating the two types of disappearing carriages already tested, the Gordon and pneumatic.

Relative times of operations with Gordon and pneumatic 10-inch disappearing carriages.

MANEUVERED BY HAND POWER.

[Elevating from −5° to +20°.]

Gordon.	Pneumatic.
The gun was elevated from −5° to +20° in 1 minute, 15 seconds at official test.	At rate of 20 minutes, 55 seconds.

[Traversing through 360°.]

The carriage could be traversed through a portion of the traverse circle easily by 4 men. Owing to settling of platform it then bound so that it could not be moved.	At rate of 2 hours, 19 minutes, and 14 seconds.

[Elevating from loading to firing position.]

The carriage was elevated from loading to firing position in 2 minutes, 7 seconds at official test.	Could not be done without filling air cylinder. 6 hours, 28 minutes, 14 seconds, employing 40 men.

[Capacity of loading and firing 10 rounds by hand.]

Ten rounds were fired from the carriage in 58 minutes and 28 seconds at official test.	Could be loaded by hand but required power to lift gun into battery. It was loaded and fired, using power—10 rounds in 1 hour, 6 minutes, and 15 seconds.

MANEUVERED BY POWER.

[Elevated from −5° to +20°.]

Required in the second Gordon carriage.	*Obtained in pneumatic carriage.*
1 minute	At rate of 53½ seconds.

[Traversed through 360°.]

2 minutes	At rate of 2 minutes and 42 seconds.

[Elevated from loading to firing position and return.]

3 minutes	The average time of lifting from loading to firing position during 10 rounds for rapidity was 1 minute and 17 seconds. Could not be returned without firing except by letting air out of cylinder, requiring 5 hours, 46 minutes by power to refill ready for firing again if emptied and probably in any event over an hour if only a portion were let off.

THE MODIFIED GORDON 10-INCH COUNTERPOISE CARRIAGE.

Capt. Gordon designed, and submitted to the Board at its September meeting, a modified form of his nonrecoil counterpoise 10-inch carriage which has so favorably impressed the Board that it has recommended that the Secretary of War contract for the construction of one of the modified carriages, and the sum of $47,700 has been allotted therefor, and the Secretary has approved the recommendation, and the Chief of Ordnance has entered into the contract for said carriage.

While the new design preserves all the characteristic features of the old, in its details it is believed to be a very great improvement thereon. The following are the main modifications:

(1) The weight of the carriage and counterpoise is very considerably reduced and the masses much more compactly disposed.

(2) The thrust of the recoil, instead of being transmitted to the hydraulic cylinders by the connecting rods and trucks, is communicated by a combination of gears, producing a direct action upon the pistons instead of the oblique thrust of the old mechanism, and the "dead center" is wholly obviated.

(3) The air chamber, or reservoir, instead of being dispersed above and across the hydraulic cylinders is placed parallel with them.

The following extract from the record of the action of the Board will show the very stringent conditions placed upon the acceptance of the modified carriage:

The carriage shall not be accepted unless it be capable of allowing the following operations to be performed *by hand power* in the times named with a detachment of not more than 15 enlisted men under the direction of an officer, namely: The 10-inch service rifle when mounted thereon shall be capable of being elevated from — 5 to + 20° within five minutes; second, the gun shall be capable of being traversed through 360° within five minutes; third, the gun shall be capable of being elevated from the loading position to the firing position within five minutes.

The carriage should be such as to permit of the firing of the service 10-inch rifle therefrom ten times in one hour, using hand power only, and there shall be a deduction of $1,000 from the contract price agreed upon for each round less than this number in said time and a bonus of $2,000 for each round greater than this number.

In determining times for this and the second set of conditions all unusual delays not incident to the working of the carriage shall be deducted from the observed times.

There shall be provided means for loading, traversing, elevating and depressing and raising the gun into battery and returning it into firing position, by electrical power; all the material except the steam engine and boiler to be furnished and set up by the contractor. With such power the gun should be capable of being traversed through 360 degrees in two minutes, elevate from minus 5 degrees to plus 20 degrees in one minute, and elevated from loading position to firing position and return to loading position in three minutes.

The carriage shall be set up by the contractor upon foundations to be built by the Government, plans of which shall be furnished by the contractor, the whole to be completed ready for official test within seven months from the date of signing of the contract. If the carriage be delivered ready for official test within less than seven months, then for each such day the contractor shall receive $100; if the delivery be not made within the seven months, then shall the contractor forfeit $100 for each day in excess of the seven months, unless the time of delivery be extended with the express understanding that this forfeiture is waived.

The date governing the payment of $100 per day bonus or forfeiture shall be the date upon which it is determined by official test in the presence of the board, after the firing of ten proof rounds, that the second set of conditions are complied with.

The contractor shall furnish a bond in 80 per cent. of the total amount of the contract to protect the United States against loss, incident to the partial payments, due to the excess of the forfeiture for delay in delivery over the retained 20 per cent.

It should be agreed that the Chief of Ordnance shall furnish, when desired, free on board cars at the works of the contractor, for the temporary use of the same, one 10-inch B. L. rifle and one 10-inch projectile of standard pattern, the same to be returned in like good condition, free on board cars at said works, within one year

from the date of contract, or such less time after the delivery of the carriage as the Ordnance Inspector may judge just.

It is further provided that, before said carriage shall be ordered, Capt. W. B. Gordon, the inventor, shall give to the War Department the right to manufacture in future at its arsenals carriages of similar design, it being understood that he reserves all rights against private parties manufacturing the same.

These conditions were subsequently modified by authorizing the omitting of the device necessary for the elevation of the gun from minus 5° to plus 20° by electric power in one minute, provided the condition for elevation by hand power from minus 5° to plus 20° be changed from 5 minutes to 50 seconds.

As the urgency for the 8-inch and 10-inch disappearing carriages is becoming great, and the entire system of defense, so far as these two calibers are concerned, is being delayed for the want of them, the Board considered it expedient to offer extra inducements in the shape of a bonus for any period less than seven months within which said carriage shall be completed and ready for test, to be paid in case it prove satisfactory and comply with the conditions imposed.

Whilst the first carriage has given good results by hand power only, and it is anticipated that in the second carriage these results will be excelled, it was deemed wise in the development of the system to require, in addition to the capacity to be operated by hand, that the carriage should be so constructed as to be capable of being maneuvered by electric power. There will be occasions in the service of these carriages when exceptionally rapid work is required. The electric plant for a search-light apparatus would be an essential part of every system of fortifications, and from its compactness it does not materially add to the cost of constructing the batteries. It is believed that such a plant will suffice for maneuvering and loading and that the power may be readily transmitted from a distance to small motors at the different batteries. For this reason it was decided to take this opportunity of inexpensively applying the system to a heavy carriage.

In giving the limits of the times within which the operations of the carriage shall be performed, it was not intended to set them as a standard. It is expected that the different operations will be performed in much less time.

THE CROZIER-BUFFINGTON DISAPPEARING CARRIAGES FOR 8 AND 10 INCH GUNS.

These carriages, of a type originally designed by Col. Buffington, of the Ordnance Department, and subsequently modified by Capt. Crozier, of the same, and for which no patents have been applied, were placed under contract with the Southwark Foundry and Machine Company, Philadelphia. The 8-inch carriage has been received at the proving grounds at Sandy Hook, and is being mounted. The 10-inch carriage is expected to be completed and ready for test by the end of the calendar year.

For the construction of one 8-inch and one 10-inch carriage of this type the Board allotted, May 6, 1891, the sum of $70,000.

In this type carriage the counterpoise weight is suspended in a well under the forward part of the carriage. The gun is trunnioned at the upper ends of two parallel levers of steel which are mounted a little above their centers upon a horizontal axis in the top carriage, which is constrained to move to the rear up an inclined plane upon a chassis roller path. The hydraulic cylinders are cast in the top carriage and the piston rods are attached to the front of the chassis rails. During the

recoil the axis of rotation moves in a right line following the chassis rail, the lower or front ends of the levers, to which are attached the counterweights, move in a vertical line, and the trunnions of the gun in an arc of an ellipse. The gun returns to firing position by means of the counterpoise.

It is expected that the test of these carriages will commence as soon as possible, and it should be completed within a few months.

THE 8 AND 12 INCH BARBETTE CARRIAGES.

The type 8-inch carriage, constructed by the Ordnance Department at the Army Carriage Factory at Watertown Arsenal, Massachusetts, after unexpected delays, is now complete, and its test carried so far as to warrant the manufacture of others of this design.

It is understood that good progress has been made with the 12-inch carriage and that it will be ready for test during the coming winter. Its manufacture has been delayed awaiting the receipt of machinery, now on hand.

While there is not the same urgent reason for expediting the manufacture of this type of carriages as of the disappearing type, yet, considering the number of guns that will hereafter be produced annually, all types can not be too soon tested and decided upon. With the completion of the Army Carriage Factory at Watertown, the manufacture of the barbette carriages can proceed rapidly with moderate cost.

On November 14, 1892, the Board made an allotment from the appropriation of 1891 of $65,000 for carriages for steel breech-loading seacoast guns procured under the act of 1888. Under this allotment there are now under construction at Watertown Arsenal seven 8-inch, five 10-inch, and four 12-inch barbette carriages.

In its last annual report the Board indicated its judgment that the Government should provide at Watertown Arsenal a seacoast gun and mortar carriage factory commensurate with the production of guns and mortars. The Board has seen no reason to change its judgment in this regard, but, on the contrary, time and experience of another year has only confirmed it.

CONVERTED 10-INCH AND 15-INCH CARRIAGES.

The work of alteration of existing 10-inch barbette carriages to adapt them to service with the 8-inch rifle, converted, and the 15-inch carriages for service with the 15-inch S. B. gun, using increased charges, still continues at the Watertown Arsenal. The act of 1893 appropriated $50,000 for this purpose, which sum is estimated to provide for the alterations of nine 10-inch barbette carriages and nine 15-inch carriages for service with 15-inch S. B. guns, using increased powder charges. Up to the current fiscal year there had been allotted funds for the alteration of one hundred and thirty-six 10-inch carriages, and sixty 15-inch carriages, which, with the money now appropriated, will be increased to one hundred and forty-five, and sixty-nine, respectively. There is still a large number of these old carriages on hand and available for alterations.

The appropriations for the alteration of these carriages under the acts of 1888, 1889, 1890, and 1891 were made subject to the allotment of this Board, but for the years of 1892 and 1893 the money was not subject to such allotment. But this matter is so closely related to the whole subject of the provision of mounts for rearmaments of our for-

tifications, and of the scheme of defense generally, that it has been here referred to in continuance of the reports of former years.

SEACOAST MORTAR CARRIAGES.

The test of the *spring-return 12-inch mortar carriage*, also known as the *Easton and Anderson carriage*, has been completed. The experiment has been tried of substituting spiral (car) springs, in place of the Belleville springs originally used, with good success.

Contract has been entered into by the Chief of Ordnance during the year for the manufacture of seventy-one of these carriages, and within a short time the 16-mortar battery at Sandy Hook will be supplied with this carriage as mounts for its 12-inch B. L. mortars.

Of these 71 carriages 28 are under construction at Providence, R. I.; 36 at Baltimore, Md., and 7 at West Point Foundry; and 9 are already on hand which were constructed at the Builders' Iron Foundry, at Providence, R. I. These, when completed, together with the two type carriages, will afford mounts for all the 12-inch mortars now produced or contracted for.

On September 5, 1893, the Board made an allotment of $1,200 for the expense of mounting four of these mortars in the Sandy Hook battery.

THE CANET 12-INCH MORTAR CARRIAGE.

This experimental carriage remains at the proving grounds at Sandy Hook, but as the spring-return carriage seems to offer better prospects of developing a suitable service carriage the firings from the Canet have not been prosecuted during the year.

The carriage is an exceedingly heavy one, principally of steel. It is capable of elevating from zero to 75 degrees, and the line of recoil always remains coincident with the line of fire. The recoil is taken up by hydropneumatic cylinders and a tapering throttling bar to gradually control the escape of the liquid in the cylinders. By the recoil air is compressed in the reservoir, called the recuperator, by which means the piece is returned into battery.

While the working of the carriage, procured as an experimental form of mortar mountings, does not warrant its present reproduction, it may be usefully employed for experimental firings.

GORDON 12-INCH RIFLED MORTAR CARRIAGE (EXPERIMENTAL).

On the recommendation of the Chief of Ordnance, the Board has made an allotment of $6,500 (July 12, 1893) for one type Gordon 12-inch B. L. rifle-mortar carriage.

Capt. Gordon has communicated to the Board the fact that he has not patented his mortar carriage, and does not intend to do so in the United States. It is understood that the Chief of Ordnance has invited bids for the manufacture of the type carriage, but the contract has not yet been placed.

This carriage will be of the general hydropneumatic type, with spring return.

AUXILIARY DEFENSES.

MINES AND TORPEDOES.

No progress has been made during the past year in the test of the *Ericsson aërial torpedo*. The Board has notified the Ericsson Coast Defense Company that it is ready to proceed with the trial of the two re-

maining torpedoes at any time, but thus far the company has not signified its readiness. The remaining torpedoes are stored at Fort Wadsworth, New York Harbor. It is expected that these torpedoes will be tested in the near future.

The Sims-Edison fish torpedo, which was described in the report of 1892 and which has been under test, has completed its experimental runs in such a manner as to comply with the terms of the contract, and has been accepted and paid for.

The reports of Lieut. Col. W. R. King, Corps of Engineers, upon the trial runs made with this torpedo in its test for acceptance under contract are hereto appended. (Appendix C.)

To enable the Board to intelligently consider the question of recommending further allotments from the balance of $24,775 still remaining of the appropriation approved March 2, 1889, which is available only for the purpose of movable submarine torpedoes, it was recommended that there be instituted by the Chief of Engineers a set of twenty or more actual runs, or such dock trials as will be decisive for determining the relative percentage of the success and failure to be expected with this torpedo, and this recommendation was approved by the Secretary of War.

Reports of these trials have not yet been received.

The Board does not recommend further expenditures upon such torpedoes at this time.

GUN AND MORTAR BATTERIES.

The act of August 18, 1890, appropriated the sum of $1,221,000 for gun and mortar batteries at Boston, New York, and San Francisco, which was allotted by the Board as follows:

Boston	$235,000
New York	726,000
San Francisco	260,000

The same act also appropriated the sum of $500,000 for sites for fortifications, all of which was duly allotted to the purposes intended. The act of February 24, 1891, appropriated the sum of $750,000 for gun and mortar batteries and $500,000 for sites for fortifications. The act of 1892 appropriated the further sum of $500,000 for gun and mortar batteries and also $500,000 for sites for fortifications, making a total of $2,471,000 which has been appropriated and allotted for batteries and $1,000,000 for sites. The appropriations made since the act of 1890 for these purposes have not been under the supervision of this Board.

The Board has visited the emplacements for the three 8-inch guns at Fort Wadsworth, New York Harbor, the gun-lift battery and the mortar battery at Sandy Hook. The latter are substantially completed and ready to receive their armament. The former await the adoption and production of suitable disappearing carriages.

The Board has not visited the gun and mortar batteries at Boston or at the eastern entrance of New York Harbor or at San Francisco, for which it made the allotments.

For details of the present state of advancement of these works, and other works not constructed under the allotments of this Board, reference is made to the current report of the Chief of Engineers.

QUICK-FIRE GUNS.

Since the last report of the Board there has been authorized to be purchased one *Schneider 12-centimeter (4.724-inch) quick-fire gun*, with 100 rounds of ammunition, which is to be tested in comparison

with the Armstrong, Hotchkiss, and Canet quick-fire guns of the same caliber.

The Hotchkiss and Armstrong guns have been received and mounted, and the Canet is en route from France. The Board has also invited the *Maxim-Nordenfelt Guns and Ammunition Company* to submit designs of a 4.724-inch gun with a view of possibly purchasing one for the same trials if it can be secured in time.

In addition to these guns of 4.724-inch caliber there is to be in the coming year a comparative test of the merits of the following *6-pounder rapid-fire guns (2.24 inches caliber)*, provision for which test has been made by the Board in the supply of the necessary ammunition, viz: Hotchkiss, Seabury, Maxim-Nordenfelt, Sponsel, and Driggs-Schroeder rapid-fire guns.

THE ROBERTSON MACHINE GUN.

On October 6, 1892, Mr. George W. Robertson, of Washington, D. C., submitted to the Board his model, designs, and description of a 2-barrel machine gun, and the Chief of Ordnance, on reference to him, reported that in his opinion it was of sufficient merit to warrant the construction of a type .45-caliber gun. The Board therefore made an allotment of $1,000 for the construction and mounting of one such gun.

The piece has been completed, fired experimentally, and the Chief of Ordnance has submitted estimates for a thorough test of the gun in the near future.

During the year the *Gerdom breech mechanism*, as applied to a 3.2-inch breech-loading rifle has been successfully tested, and it is now being adapted to the use of a metallic cartridge. In it the breech block is threaded on two segments, top and bottom. The carrier ring has projecting from its front face a mass of metal, corresponding to a portion of the jacket, slotted away so that the block may be rotated about the vertical hinge pin situated nearly opposite the front face of the block. The extractor, which is a full circle, is worked by rotating the block about the hinge pin.

RANGE FINDERS.

With a view of testing all available forms of range finders which give promise of merit many have been allotted for by the Board and some of them have been received and their test is in progress.

Two instruments for seacoast defense have been purchased, viz: The Fiske range and position finder, which is an instrument using a horizontal base, in which the horizontal triangle, with a base of about 277 yards, is solved electrically by the principle of the Wheatstone bridge; and the Lewis range and position finder, in which the vertical triangle, the base of which is the height above the sea level, is solved mechanically.

Both instruments are of delicate construction and are not readily moved from one position to another.

A third form of seacoast range and position finder, the Zalinski, is to be tested, and, if it proves satisfactory, will be purchased.

The following field instruments have also been ordered and will be tested: The Watkins depression range finder for field artillery; the Aide-Tireur, Nolan, Unge, Labbez, Gordon, Pratt, Broad Arrow, Wat-

kins infantry telemeter, and the English infantry Mekometer for use of infantry and field artillery. It is believed that from these many forms one suitable for the service may be selected.

SMOKELESS POWDERS.

The Board in May and December, 1892, and in May and October of this year has allotted sums aggregating $4,625 for procuring smokeless powders for experimental test. Very satisfactory progress has been made in this direction. Indications give ground for the belief that an American powder will be developed superior to that in use abroad. Considering the pecuniary reward to be gained, it is a field in which powder makers might well vie with each other.

HIGH EXPLOSIVES.

The progress made during the year with firings of high explosives from powder guns has been most satisfactory. The following report of the committee of the Board charged with this work is embodied in full as it is believed to be of marked interest:

NEW YORK CITY, *October 31, 1893.*

The committee on high explosives has the honor to submit the following report upon its work accomplished during the past year:

The necessary firings from guns has been conducted under the direction of the Chief of Ordnance by Capt. Heath, in charge of the ordnance proving ground at Sandy Hook, to whom the committee is indebted for much valuable assistance.

The following extracts from the programme adopted by the Board for these investigations are quoted from the last annual report for convenience of reference:

"(1) *Which is the best explosive for use in shells?*—To decide this point we must consider (*a*) safety in handling and storage, regard being had to ordinary shocks and friction in handling, to deterioration in store, and to extremes of heat and cold; (*b*) intensity of action when exploded; and (*c*) density of loading. Should the trials prove that several varities of high explosives can be safely fired in projectiles the ultimate choice between them will depend on these considerations, and they should also largely influence the order in which trials are made. * * *

"(2) *Is an explosion of the first order or detonation assured with the different modes of loading proposed by the inventors to prevent premature explosion?*—To test this matter it is proposed to explode duplicate sets of cast-iron shells like those shown on page 299, Report of the Chief of Ordnance for 1884 (caliber, 8-inch; cavity, 5 inches in diameter and 10 inches deep; capacity, about 192 cubic inches, or 6.9 pounds of water). One set will be charged precisely as proposed by the inventor; the other will contain the same amount of the explosive in a compact mass, with the rest of the cavity sand-filled. The projectiles will be placed at the bottom of holes about 8 inches in diameter and 4 or 5 feet deep, bored in uniform clay soil and tamped with sand. From the measured crater radii after the explosion it is believed that a fair idea can be formed as to whether the loading devices reduce the order of the explosion. * * *

"(3) *Will the explosive stand the friction due to rifled motion when loaded as proposed?*—To obtain more definite information as to the heating effect of this motion than is now available, it is proposed to communicate a high rotary velocity to projectiles by mechanical means, and thus investigate the subject practically. * * *

"(4) *Will the explosive stand the shock of firing when loaded as proposed by the different inventors?*—To test this matter it is proposed to purchase one hundred 7-inch and fifty 11-inch projectiles of the pattern described above, and to fire them from the 7-inch Ames gun and from the 11-inch converted muzzle-loading rifle at Sandy Hook."

During the past year firing from the 12.2-inch experimental mortar with full service charges (78 pounds brown prismatic powder) has been added to this programme.

"All these experiments should be made by firing at long ranges over water, so that a practical test of the effect of rifled motion as well as the shock of firing may be had.

"(5) *Will the igniting mechanism stand the shock of firing and the rifled motion without premature action?*—This matter should be tested quite independently of the explosive, which may be accomplished by using shells charged with powder in a field or siege gun, or perhaps by charging several primers in one shell, thus reducing expense.

"(6) *Will the igniting mechanism act as desired?*—This may be tested by firing shells charged with powder.

"(7) *Will the shell, without the igniting mechanism, explode on impact (a) with water; (b) with earth; (c) with stone; (d) with wood or wrought iron, and (e) with iron armor?*—Information on some of these points will be obtained incidentally, and the others may be left for future consideration."

The following summary gives the operations during the season just closed:

SUBTERRA SHELL TRIALS.

The methods used under headings (1) and (2) of the programme are fully described in Appendix E of the annual report of the Board of Ordnance and Fortification for the year ending October 30, 1891.

The only explosive presented for investigation during the past year has been ammonite, a partial test of which in 1892 is reported on page 24 of the last annual report of the Board. Mr. Harry Allen was present at the recent experiments, and submitted two varieties for trial. One, which will be designated (A), was identical with that tried last season; the other (B) was slightly modified with a view to correct the difficulty in obtaining detonation then developed. Both varieties were put up in leaden cases hermetically sealed and containing about 14 ounces. Both had a light straw color, but (A) was like flour in consistency, very hard to compact in the shell, while (B) was caked in hard cylinders and required to be pulverized before it could be properly loaded. After this disruption it admitted of being closely compacted by ramming.

Two trials with (A) and four trials with (B) were made in the month of June, when the temperature was normal for that season.

The previous experiments having indicated that full detonation with this explosive is difficult and uncertain, special primers had been prepared, which, it was considered, should be sufficiently powerful to detonate any explosive suitable for use in shells. Each consisted of a service submarine-mine fuse, containing 24 grains of mercuric fulminate, inserted in dry Stowmarket guncotton imported in 1871 for trial at Willets Point. This guncotton was in the form of cylinders about an inch in diameter and an inch and a quarter long, with a small central hole. Each disk weighed about half an ounce. One of the primers contained two and the other three of these cylinders, firmly lashed end to end, and fitted to receive the fuse at one extremity. These primers were bedded in the axis of the charge, and they extended through a sufficient length to deliver a very severe shock to the explosive.

Mr. Allen also submitted primers of the pattern proposed by him for use in shells when fired from guns. Each consisted of a thin brass cylinder 1.2 inches in diameter and 2.15 inches long. A 31-grain copper detonator was held fast by a rubber tube which was incased in brass half cylinders and clamped within the main cylinder at one of its ends. The charged end of the detonator projected into the chamber, occupying about 1.25 inches at the base of the main cylinder. The bottom orifice was closed sometimes with a rubber and sometimes with a brass disk. The chamber was always filled with about an ounce of uncompressed ammonite loosely inserted. Ignition was secured by a service submarine-mining cut-off, containing 4 grains of mercuric fulminate and so placed that when ignited by electricity the flash would enter the open end of the detonator. Mr. Allen's primer, therefore, contained 35 grains of mercuric fulminate and an ounce of loose ammonite; he was of opinion that it should be amply sufficient to detonate the charge of the shell in which it was embedded.

In the first trial with the (A) variety, the shell was charged with 7.25 pounds, completely filling the cavity, and one of our primers, containing 1.5 ounces of gun cotton, was used. This charge was buried and exploded normally, giving a measured mean crater radius of 3.80 feet and a line of least resistance of 3.70 feet. Our experimental formula indicates that this crater should be formed by a charge of 3.20 pounds of explosive gelatin, giving 44 per cent. as the relative strength of this grade of ammonite. This figure is identical with that reported as the result of our last season's work.

The next trial with the (A) variety differed only in substituting one of Mr. Allen's primers for our own. The shell was buried in a hole giving a line of least resistance of 3.7 feet, the charge being 7.25 pounds, as before. On passing the electric current a muffled sound was heard, and a partial explosion, sufficient to clear the hole of sand, occurred. White vapor escaped for several minutes. Upon recovering the shell an all-round fracture was found, on a line varying from 9 to 10 inches from the point, completely separating the forward from the rear portion. Back of this line the shell had broken into twenty-six pieces of varying size; in front of the line it was intact and tightly packed with the explosive in normal condition.

Since three out of the four trials last year had failed to secure full detonation, this result was considered sufficient to condemn this variety of the explosive for use in shells.

Experiments were continued with the new (B) variety, now submitted for the first time.

In the first trial the shell was charged with 6.5 pounds compacted as solidly as its light character well admitted, completely filling the cavity. The primer was of 1 ounce guncotton type. The explosion was normal, giving a line of least resistance of 3.65 feet and a measured mean crater radius of 3.98 feet. The formula indicates that 3.60 pounds of explosive gelatin would be required to do this work, giving 55 per cent. as the relative strength of this grade of ammonite.

In the next trial the shell contained 6.5 pounds as before, but one of Mr. Allen's primers, closed with a rubber disk, was used. The explosion was normal, giving a line of least resistance of 3.70 feet and a measured mean crater radius of 3.88 feet. The formula indicates that 3.38 pounds of explosive gelatin would be required to do this work, giving 52 per cent. as the relative strength of this grade of ammonite.

The next trial was designed as a repetition of the last. The charge was 6.5 pounds, and one of Mr. Allen's primers closed by a brass disk was used. The explosion appeared to be normal, but with a line of least resistance of 3.70 feet the measured mean crater radius proved to be only 3.31 feet. To give a crater of these dimensions, only 2.23 pounds of explosive gelatin would be required by the formula, indicating only 34 per cent. as the relative strength developed by the ammonite. The inference is that the explosion was only partial in character.

The experiments terminated by testing how this new variety of ammonite would act under conditions similar to those used in the trials of last season with the (A) variety. A charge of 6.94 pounds was forced into the shell, and primed with the single service submarine mining fuze containing 24 grains of mercuric fulminate. The shell was buried to give a line of least resistance of 3.70 feet. Applying the current produced no sensible effect, but the detector showed that the electrical circuit was broken. The shell was raised, and on opening it was found that the fuze had exploded, making a cavity the bottom of which was about 6 inches and the top about 2.5 inches below the plug. Laterally the cavity extended nearly to the sides of the shell, but the shape was somewhat corrugated and discolored by deposited mercury. Not even a partial explosion had occurred under this tremendous shock. The ammonite was compressed into a solid mass much harder than could be effected by ramming.

The trials with this shell were continued. The bottom of the cavity was covered to the depth of an inch with a loose layer of the explosive; two submarine mining fuzes coupled in series and tied together were inserted, and the remaining part of the cavity was filled with loose explosive.

One pound was thus introduced, making the entire charge 7.94 pounds. The shell was buried to give a line of least resistance of 3.65 feet, and an apparently normal explosion followed. On measuring the crater radius, however, it was found to be only 3.46 feet, calling by the formula for only 2.48 pounds of explosive gelatin to do equal work. This indicates only 31 per cent. as the relative strength developed by the ammonite and, from a comparison of the first two trials, justifies the inference that this explosion also was only partial.

From these investigations it appears that the grade of ammonite designated (A), when fully detonated, has about 44 per cent. of the strength of explosive gelatin, and that grade (B) has, under like circumstances, about 53 per cent. of the same—both measured by the power of throwing earth under conditions similar to those adopted in these experiments. The corresponding capacity of the subterra shells, reduced to the original volume (192 cubic inches), is, say, 7.5 pounds for grade (A) and 7.1 pounds for grade (B). Hence for the relative merit of these two grades, measured by the energy they could develop in a shell, we have:

Grade (A).....$44 \times 7.5 = 3.30$.
Grade (B).....$53 \times 7.1 = 3.76$.

The corresponding figures of merit for other explosives tested by us, and submitted in previous annual reports of the Board, are as follows:

Perunite B	1.44	× 12.2	= 17.57	(failed in other respects).
Perunite C	1.28	× 12.2	= 15.61	(failed in other respects).
Perunite D	1.12	× 12.2	= 13.66	(failed in other respects).
Americanite A	0.38	× 7.5	= 2.90	(failed in other respects).
Americanite B	0.47	× 11.5	= 5.42	(failed in other respects).
Explosive gelatin	1.00	× 10.0	= 10.00.	
Rackarock	0.78	× 12.0	= 9.36.	
Emmensite	0.56	× 9.8	= 5.49.	
Guncotton wet	0.51	× 6.2	= 3.16.	
United States rifle powder	0.23	× 7.5	= 1.72.	

In view of theexcessive difficulty of certainly producing detonation in a shell charged with ammonite (proven by the trials above reported), of the very deliques-

cent nature of ammonium nitrate which forms the greater part of its composition, and of its relatively low strength as shown by these figures the committee does not recommend further trials with this explosive.

ROTATION TRIALS.

All the explosives submitted to the Board which have been judged to have sufficient merit to warrant trial by this method having already been tested, no experiments with the rotating apparatus have been made during the past year to carry out heading (3) of the programme.

SHOCK IN THE GUN.

At the date of the last annual report of the Board the only explosives under trial which have been judged worthy of test under the fourth heading of the programme were explosive gelatin, rackarock, emmensite and wet guncotton. The two last-named had successfully borne all the prescribed tests in the 7-inch Ames gun and in the 11-inch converted rifle. Repeated shell charges of 26 pounds of emmensite, loaded in the simple manner usual with black powder, had been fired with a muzzle velocity slightly exceeding 1,400 feet per second and pressures in the bore of 25,000 pounds, without explosion. In like manner repeated charges of 12.5 pounds of wet guncotton, with the interstices filled with a half-and-half mixture of paraffin and carnauba wax, had been fired with a muzzle velocity of 1,435 feet per second and pressure in the bore exceeding 38,000 pounds. Explosive gelatin in charges of 6.5 pounds subdivided by diaphragms had failed in the 7-inch Ames gun, destroying it; but further tests to determine the merit of Dr. Justin's method of loading had been ordered. As rackarock mixed had borne successfully the trials in subterra shells, and on the rotating machine, it remained to try it also in actual firing.

The ordnance provided for these experiments consisted of a 7-inch Ames muzzle-loading rifle, an 11-inch muzzle-loading rifle converted from a 15-inch Rodman smooth-bore, and a 12.2-inch breech-loading rifled mortar of cast iron hooped with steel, of the same general design as the service pattern.

The firing has been conducted at the ordnance proving ground at Sandy Hook, under the direction of the Ordnance Department and in the presence of one or both members of your committee. One of the shots from the mortar was witnessed by the entire Board. The following are the results of the year's practice:

(1) *With rackarock.*—The firing took place in the month of December. Ten shells were fired from the 7-inch Ames gun, with charges of 25 pounds of DuPont's hexagonal E. V. K. powder, giving a velocity of about 1,425 feet per second and a pressure in the bore of about 26,000 pounds. The shells contained 11.5 pounds of rackarock; the first eight charges of the explosive having been prepared for firing a week and the other two five months before the test. The firing was seaward and without fuzes. No explosion occurred except with one of the five-month charges. This shell broke up in the gun, scoring the lands, but doing no serious damage. A partial explosion of rackarock occurred, as shown by the greenish yellow color of the deposit on the pressure gauge and the absence of the usual powder fouling. No abnormal pressure was indicated.

The trials proceeded in the 11-inch gun. One shell was fired with 115 pounds of DuPont's hexagonal E. V. K. powder, giving a velocity of about 1,425 feet per second and a measured pressure of 36,467 pounds in the bore. The shell was charged with 35.3 pounds of rackarock prepared for use a week before. The projectile broke up in the gun, the fragments striking seaward. The lands in the gun near the muzzle were badly scored, and the driving edges near the seat of the shell as well. The odor of the smoke in the bore and the absence of the ordinary powder fouling indicated a premature explosion, probably partial in character; but under the circumstances no further trials were deemed proper.

These shells were all of steel, the 7-inch having cylindrical and the 11-inch octagonal cavities. The patterns had been well tested, and no breaking up under the shock of discharge was to be apprehended.

(2) *With explosive gelatine.*—On page 34 of the last annual report of the Board of Ordnance and Fortification a full description is given of Dr. Justin's system of firing high explosives, as exhibited to the Board at his range near Perryville in June, 1892. In brief, the explosive is placed in an interior carrier so pivoted longitudinally as to relieve it from the rotary shock at discharge, as well as from any tendency to generate heat by friction during flight.

The direct shock at discharge is transmitted to the explosive through the wooden base of the carrier, which rests, or which is supposed to rest, in contact with the base of the shell cavity. At the experiments witnessed by the Board at Perryville eleven shots were fired from a 60-pounder Parrott and a 9-inch Blakely gun, with

muzzle velocities in each not exceeding 1,000 feet per second. The shells were charged with camphorated forcite No. 1, containing about 7 and 32 pounds, respectively. No premature explosion occurred.

While decidedly of opinion that with shells to be fired from mortars against the decks of ships the waste of interior space, the complexity, and the expense of any carrier system of loading should be avoided by selecting some high explosive which admits of the usual simple mode of packing, the Board still appreciated that in the case of armor-piercing shell where the interior cavity is extremely contracted it may be possible, even with the drawbacks of a carrier, to obtain greater explosive energy by using explosive gelatine with its high intensity of action and great density of loading, than by depending on a less powerful agent. Computation upon the best obtainable data justified this view; and it was therefore decided to test the Justin method under the higher velocities and greater shocks possible at the proving ground at Sandy Hook. Ten shells were accordingly procured from the inventor suited to be fired from the 7-inch Ames gun. They were fired in June 1893, when the thermometer read about 62° F.

The propelling charge was 25 pounds of DuPont's hexagonal E. V. K. powder, giving a velocity slightly exceeding 1,400 feet per second and a pressure ranging from 24,000 to 29,040 pounds. The shell charge was about 7.5 pounds of explosive gelatine containing 4 per cent. of camphor. The shells were all fired seaward, without fuzes. With nine of them the elevation was about 11°, giving a time of flight of about sixteen seconds, and no explosion occurred. The last was fired at zero elevation, and the shell exploded just in front of the muzzle, breaking up into many pieces, several of which were recovered. One fragment fell about 100 yards from the gun about 45° off the line of fire. In the shells as furnished there was a slight play between the bottom of the cavity and the base of the carrier. In firing at 11° of elevation these surfaces were probably in contact, for the carrier moved very freely within the shell. Dr. Justin, who was present at the experiments, attributes the explosion at the last round to a want of contact as above, causing a shock upon discharge which upset and burst open the carrier, permitting the explosive to come in contact with the walls of the shell, and thus defeating the object proposed in his method of loading. This explanation is consistent with all the known facts in the case; but it illustrates how precisely every detail must be observed in dealing with projectiles containing this tempting explosive.

(3) *With wet guncotton.*—The programme of tests was continued by firing from the 12.2-inch mortar with propelling charges of 78 pounds of DuPont's brown prismatic R. H. B. powder, lot 11, density 1.815. The elevation ranged between 42 and 43 degrees, and the time of flight between 40 and 43 seconds. The shells were of forged steel of a pattern designed by the Ordnance Department to contain about 100 pounds of emmensite and weighed, loaded, about 800 pounds. They contained about 55 pounds of Walsrode wet guncotton, packed with a half-and-half mixture of carnauba wax and paraffin, completely filling the cavity. To embrace all usual air temperatures the trials were extended to include firing in January at 16° F., and in July at 94° F. The pressures, each measured by two gauges, were very uniform, ranging from 26,000 to 30,000 pounds. The velocity per second was about 1,000 feet. Five shells were fired to sea without fuzes, and no premature explosion occurred.

(4) *With emmensite.*—The mortar, the elevations, the propelling charges, the shells, the pressure, and the velocities were the same as with the wet guncotton above reported. The air temperature ranged from 13° F. to 90° F. The charges were compacted by ordinary compression, and ranged from 86 pounds to 88 pounds. Five shells were fired seaward and no premature explosion occurred.

IGNITING MECHANISM.

Detonating fuzes of six varieties, designed and fabricated by the Ordnance Department, were received in July, 1893. For the purpose of determining the effect of the shock of discharge, one of each design, after thorough drying and without percussion attachment, was fitted to the base of a service-pattern shell, the shell cavity having been previously filled with well-compacted earth that the housing might be properly supported. Using full charges in a 12-inch B. L. cast-iron banded mortar, the shells were then fired into a sand butt, subsequently recovered, and the fact disclosed that all had satisfactorily stood this initiatory test. Further experiment is now in progress.

EXPLOSION OF SHELL ON IMPACT.

The trials under heading (7) of the original programme have thus far been restricted to impact on water. In no instance has an explosion occurred with a shell not provided with a fuze designed to effect this object.

RECAPITULATIONS AND RECOMMENDATIONS.

The conclusions reached by your committee from the trials made during the past year may be summed up as follows:

(1) The investigations made of two grades of ammonite demonstrate that its detonation by fuzes suitable for use in shells fired from powder guns is difficult and uncertain, and that the explosive in its present state of development is inferior to other types that have been tried at Sandy Hook. No further experiments are recommended.

(2) The trials with rackarock have shown that when mixed in the normal proportions it can not be safely fired from guns. Its high merits on the score of intensity of action and density of loading, however, will warrant its being retained on the list for further investigation.

(3) All our trials with explosive gelatin have demonstrated that its tendency to detonation under the shock received in the gun is very much greater than with certain other well-known types of high explosives. While less powerful the latter are still strong and far safer for practical use in shells. The degree of success attained by Dr. Justin, perhaps, should forbid final condemnation; but whether his method, with every detail adjusted correctly, would permit the use of full armor-piercing velocities of 2,000 feet and upward is still very far from proven. The experiments have been carried as far as can well be done without serious risk of destroying one of the new high-power guns, of which the number on hand is limited, and your committee does not feel warranted in recommending such trials at present.

(4) The long series of experiments with wet guncotton and emmensite, inaugurated in 1889, have demonstrated to the satisfaction of your committee that either may safely be used as service charges in our 12-inch mortar shell, and it is in this class rather than in armor-piercing projectiles that the chief demand for high explosive charge exists.

It remains to determine which of the two explosives should be preferred.

In so far as relates to safety in handling, including ordinary shocks and friction, and to effects of extremes of heat and cold, they stand on an equal footing. Both are believed to be thoroughly safe.

In the matter of possible deterioration during long storage, guncotton has the advantage, as its rival is of much more recent date, and time has been lacking for proper records to be kept. The service requirements are that no injury shall result from long confinement in closed iron or steel shells stored in seacoast magazines. Your committee is informed, upon trustworthy expert authority, that in a trial of emmensite, conducted under conditions similar to these and extended over a period of two years, with the metal unprotected, no gases were developed and the corrosion exhibited was insignificant, and that in shells which had been coated with paraffin no action whatever occurred. So far as the matter has been tested, therefore, emmensite promises to meet the requirements perfectly, but further trials in this direction are desirable.

In intensity of action the two explosives may be regarded as having practically equal merit, the figures given by our subterra shell measurements, referred to explosive gelatin as 1.00, being 0.51 for wet guncotton and 0.56 for emmensite.

In the matter of density of loading emmensite is greatly the superior the ratio in our subterra shell being $\frac{9.8}{6.2} = 1.6$, and in the 12.2-inch mortar shell being $\frac{87}{55} = 1.6$. Allowing for the slightly greater intensity of emmensite these figures both become 1.74.

It appears, therefore, that upon the whole emmensite has decidedly the advantage.

It is quite certain that 100 pounds of emmensite exploded in the interior of a war ship, whether entering through the deck or unarmored side, would be decisive, and mortar shells carrying this charge are easily and cheaply provided. Moreover, so long as the propelling charge in 8-inch, 10-inch, and 12-inch high-power guns is restricted to give initial velocities not exceeding 1,000 feet per second, charges up to this limit may safely be fired from them.

It has also been proved that charges of 25 pounds may be fired safely from guns with 1,400 feet velocities, and very possibly the same may be true for still larger amounts and higher velocities, but it is best in these matters to proceed no further than established facts warrant.

The same principles applied to shells fired from our existing armament of older types will add enormously to their efficiency.

These results make it apparent that this investigation has already reached a point justifying practical conclusions of no small importance. The following programme is suggested for its continuation in the early future:

(1) With subterra shells, with the rotating machine, with the 7-inch Ames gun, with the 11-inch muzzle-loading rifle, and with the 12.2-inch mortar, such tests as

may be needed from time to time to determine the merits of any new explosive or mode of loading which may be approved by the Board for trial.

(2) With 8-inch high-power B. L. rifle. Trials to test the safety of firing emmensite with higher velocities and pressures than can be given in the lower-power guns heretofore available.

(3) The continuation, under headings (5), (6), and (7) of the original programme, of the trials with igniting mechanism, and of the trials to determine the effect of the concussion of shells charged with emmensite against different solid materials.

Respectfully submitted.

HENRY L. ABBOTT,
Colonel of Engineers, Bvt. Brig. Gen., U. S. A.
CLIFTON COMLY,
Major, Ordnance Department, U. S. A.

PLATES FOR DECK-PIERCING PROJECTILES.

On January 24, 1893, the Board allotted the sum of $4,800 for testing deck-piercing shells for the 12-inch B. L. mortar. The same amount was allotted for another plate September 6, 1893, to test a second lot. A third plate was allotted for October 25, 1893. Detailed reports of the experimental firings against these plates will be found in the reports of the Chief of Ordnance.

PROVING GROUND, SANDY HOOK.

The Board invited attention in its last annual report to the urgent need of increased facilities for carrying on the experimental and testing and proving operations at Sandy Hook.

During the past two years great progress and improvement have been made in this regard; nevertheless, work has accumulated even more rapidly than the increased facilities have been provided, and as the work carried on at the proving ground is largely of the experimental character intrusted to the Board, it has supplemented the appropriations of Congress by allotments from the funds under its control to further facilitate and expedite this work. Among such allotments have been the following:

Nov. 14, 1892. For strengthening wharf at Sandy Hook for the better handling of guns for test and proof	$2,500
Feb. 24, 1893. For increased facilities to repair butts	750
Feb. 24, 1893. For sand butt	500
Feb. 24, 1893. For cast-iron bed-plate for platform of experimental guns	3,540
July 14, 1893. For explosive chamber for testing high explosives	4,000
Sept. 6 and Oct. 27, 1893. For removing and utilizing the railroad track purchased from the New Jersey Central Railroad Company, under act of 1892, so that guns, mortars, carriages, etc., for test or proof may be brought direct to the line of the experimental battery	12,000
Total	23,290

TESTING AND PROVING WORK.

As shown in a former part of this report, under the head of "Seacoast guns," there will be completed by the end of this fiscal year forty-one 8-inch, twenty-eight 10-inch, and twelve 12-inch high-power B. L. rifles. In addition there will be eighty 12-inch B. L. mortars already contracted for, and probably all delivered by the date named.

There are to be tested from funds allotted by the Board:

(1) The type 12-inch B. L. rifle (to be completed).
(2) The Woodbridge 10-inch wire-wound gun (experimental).
(3) The Brown segmental-tube wire gun (to be completed).
(4) The Haskell multicharge 8-inch B. L. rifle.
(5) The all-steel 12-inch B. L. mortar.

(6) The second lift of the 12-inch battery.
(7) The Gordon 10-inch disappearing carriage (to be completed).
(8) The Gordon modified 10-inch disappearing carriage.
(9) The Gordon 12-inch mortar carriage.
(10) The Crozier-Buffington 8-inch and 10-inch disappearing carriages.
(11) The 12-inch Creusot (lift) carriage (to be completed).
(12) The 12-inch minimum port casemate carriage.
(13) The following types of 4.724-inch quick-fire guns: The Armstrong, Hotchkiss, Canet, and Schneider.
(14) The Driggs-Schroeder, the Hotchkiss, the Seabury, the Sponsel, the Maxim-Nordenfelt 6-pounder rapid-fire guns.

In addition to the foregoing to be tested, it is evident that there will also be on hand and to be proved, at the ordnance proving ground, by the Chief of Ordnance, the following guns and mortars:

(1) About thirty-eight 12 inch mortars, cast-iron, steel-hooped.
(2) About seven 12-inch mortars, all steel.
(3) About forty 8-inch B. L. rifles, steel.
(4) About twenty-eight 10-inch B. L. rifles, steel.
(5) About twelve 12-inch B. L. rifles, steel.

And to this must be added the test of powders—slow-burning and smokeless—high explosives, projectiles, and armor plates; an accumulation of work not heretofore known at the proving ground.

The proving ground is the gateway through which everything must pass to actual utilization and service. It is especially the center of interest and progress in the work of this Board. It therefore feels justified in again urging the desirability of the very best facilities for carrying on and expediting this work.

Very great improvement has been made in the last two years, and liberal appropriations should be continued. Unwise economy here is wastefulness everywhere else.

In connection with this subject, and especially as related to plans connected with the very extensive testing and proving work that will have to be carried on at Sandy Hook in the next few years, including extensive tests of high explosives, the Board would invite the attention of Congress to the desirability of the immediate removal of the temporary quarantine station established last season upon a portion of the Government reservation at Sandy Hook.

The occupation of this temporary station, which was permitted under the stress of a great and sudden emergency, if allowed to become permanent would very greatly hamper and impede the regular experimental work at this station, and render wholly impossible the contemplated proof battery, for the proving of guns and mortars, on the site now occupied by the quarantine station. The line of the experimental battery, near the old fort, is already crowded, and to place the proof battery there would be impracticable; and the only remaining site for it appears to be upon the very ground now occupied by the quarantine station.

The great urgency of the work, which can be carried on only at Sandy Hook, renders it desirable that this occupancy for a purpose wholly foreign and incompatible, should be removed as early as possible and at a time when no present necessity for its continuance exists.

ESTIMATES FOR NEXT YEAR.

On the 28th day of September last the Board transmitted to the Secretary of War, through Maj. Gen. J. M. Schofield, president of the Board, its estimates for the amount needed for expenditure under

the supervision of the Board in continuing its experimental work and in testing new guns, carriages, mortars, powders, and explosives, and other devices and materials of war during the ensuing year, amounting in the aggregate to $385,000. The principal items upon which this estimate is based are given in detail, and for convenience of reference, and for record, are inserted here, as follows:

For the investigation and test of smokeless powders with the view to determine the best type for adoption for service in seacoast, siege, field, rapid-fire, and machine guns	$50,000
For platforms, emplacements, etc., for gun carriages, and expenses incidental to the test	25,000
For testing seacoast guns, including the Lyman-Haskell 8-inch multicharge gun	50,000
For experiments with high explosives	25,000
For test of field, siege, and rapid-fire guns, including additional tests of the Brown segmental wire 5-inch gun	10,000
For improving facilities of the Sandy Hook proving ground, with a view of expediting the experimental work	10,000
For the purchase, development, and test of experimental torpedoes	25,000
For procuring experimental gun carriages	100,000
For procuring and experimenting with sights, range finders, and position finders	25,000
For the test of fuses	10,000
For experimenting in direction of developing armor for coast defenses and purchase of same for test	25,000
For the manufacture and test of experimental breech mechanisms for field, siege, rapid-fire, and seacoast guns	20,000
For the necessary expenses of the Board, including salary of civilian member	10,000
Total	385,000

While these items embrace the principal expenditures that can be foreseen, there are always a large number of minor matters constantly arising which can not be anticipated. The experimental work is now at its height, as has been indicated in the preceding pages, but it is hoped that this stage will, in the main, soon be in the past, and smaller appropriations will then suffice for this class of work. Meanwhile it is desirable that there shall be no delay here, as such delay retards work all along the line of defense.

CONCLUSION.

Upon the whole it may be said that the past year has been one of very satisfactory progress. In surveying the advance made since Congress adopted the policy of more liberal appropriations for works of coast defense initiated by the passage of the act of September 22, 1888, it is a source of satisfaction to observe the changed situation which five years have brought about. The gun factory has been completed and nearly equipped on a liberal scale; a goodly number of high-power guns and mortars of excellent quality have been produced, and tested in whole or in part; satisfactory types of gun-lift mounts for 12-inch guns, and barbette carriages for 8, 10, and 12 inch B. L. guns, and for the 12-inch B. L. mortar, have been developed and produced, and the way prepared for their manufacture for service; the selection of a suitable disappearing carriage for 8-inch and 10-inch guns, for sites where required, is believed to be approaching satisfactory solution at an early day; emplacements for both guns and mortars have been well advanced in a number of the most important positions, for which appropriations have been made, and as fast as these can be completed, the armament, except, possibly, disappearing carriages, will be in readiness; a type

carriage for casemate batteries has been acquired with right to manufacture; great progress has been made in the development of smokeless powders and high explosives, and recent experiments indicate that we are now on the eve of the demonstration that shells charged with explosives of a high order can be fired with powder from rifled guns; and an excellent advance has been made in the development and production of range and position finders so essential as an adjunct of modern coast defenses.

In short, in five years the whole situation has been changed, and, with nearly every problem solved, or well on the way to solution, the future ought to witness a rapid progress toward the completion of our system of defenses. With enlarged and improved facilities now provided and soon to be created in the gun factory, the army carriage factory, and at the Government proving grounds, as well as in the great private plants for the production of forgings, guns, mortars, carriages, projectiles, and explosives, the work can now go forward at a rate that will give the country a practically complete system of modern defenses and armaments early in the next decade, if the requisite appropriations be forthcoming.

J. M. SCHOFIELD,
Major-General U. S. Army, President of the Board.
HENRY L. ABBOT,
Colonel of Engineers, Bvt. Brig. Gen., U. S. Army.
HENRY W. CLOSSON,
Colonel Fourth Artillery, U. S. Army.
CLIFTON COMLY,
Major Ordnance Department, U. S. Army.
BYRON M. CUTCHEON,
Civilian Member, Board of Ordnance and Fortification.
C. C. MORRISON,
Captain, Ordnance Department, U. S. Army,
Recorder of the Board.

APPENDIX A.

Table showing allotments made by the Board of Ordnance and Fortification from October 31, 1892, to October 31, 1893, including statements of unexpended balances under the several appropriations.

ACT OF SEPTEMBER 22, 1888.

Purpose of allotment.	Date.	Section.	Amount.
	1892.		
To secure a supply of powder for testing the Hotchkiss 6-pounder rapid-fire gun	Nov. 14	6	$500.00
For the purposes of covering the necessary expenses at Sandy Hook Proving Ground in testing high explosives, this sum to be in addition to the allotments heretofore made for the same purpose	Nov. 14	6	183.29
For the construction of a suitable sand butt at the proving ground at Sandy Hook, to be used in connection with experimental firings with the 12-inch B. L. rifle mounted on the gun lift	1893. May 25	3	500.00
For repairs and improvements to the 5-inch siege carriage, Raskazoff pattern	July 12	3	250.00
For the purchase of 12 cm. quick-fire gun and mount with cast-iron shield, of design of Schneider & Co. (Creusot, France), provided there be furnished working drawings of the gun, breech mechanism, mounting, shield, and cartridge	July 12	3	8,000.00
For the manufacture of a Gordon spring return carriage for the 12-inch B. L. mortar, steel	July 12	3	6,500.00
For the repairs to the 10-inch Gordon disappearing gun carriage	July 14	3	1,000.00
To enable Capt. Gordon to prepare and submit to the Board drawings for an improved design of 10-inch gun carriage, on the same general principles as his carriage for gun of like caliber	July 14	3	300.00
For the mounting of 4 12-inch mortars at Sandy Hook	Sept. 5	3	1,200.00
For changes in the Crozier-Buffington 10-inch gun carriage	Oct. 24	3	1,020.00
Total			19,453.29

Total allotted to October 31, 1892 (see Second Annual Report)	$3,952,300.04
Allotted from October 31, 1892, to October 31, 1893	19,453.29
Total allotted to date	3,971,753.33
Total appropriated under this act	3,972,000.00
Total allotted	3,971,753.33
Balance available for allotment	246.67

ACT OF MARCH 2, 1889.

Total allotted, expended, and reverting to Treasury to October 31, 1892 (see Second Annual Report)	$1,250,819.00
Total allotted to date	1,250,819.00
Total appropriated under this act	1,289,594.00
Total allotted, expended, and reverting to Treasury to October 31, 1893	1,250,819.00
	38,775.00
Reappropriated in act of August 18, 1890 (see First Report of Board, p. 37)	14,000.00
Balance available for allotment	24,775.00

The above balance is available *only* for the purchase of movable submarine torpedoes.

Table showing allotments made by the Board of Ordnance and Fortification from October 31, 1892, etc.—Continued.

ACT OF AUGUST 18, 1890.

Purpose of allotment.	Date.	Amount.
For the manufacture and test of a 12-inch elevating carriage of designs of A. H. Emery	1893. Feb. 24	$130,000.00
For extra material and labor connected with gun-lift battery, for expenses connected with test of Gordon disappearing carriage, and for increasing facilities to repair butts for experimental firings at the Sandy Hook proving ground	Feb. 24	2,500.00
For the manufacture and erection of 1 cast-iron platform bed-plate for mounting gun carriages at the Sandy Hook proving ground, for experiment and test	Feb. 24	3,540.00
For the purpose of fitting the 5-inch type gun with the modified Seabury breech mechanism to permit the use of the gun for experimental firings	Feb. 24	350.00
For the procurement of copper cylinders for pressure gauges for use in testing the Brown segmental-tube wire gun	May 25	80.00
For the further test of the Brown segmental-tube wire gun	Sept. 6	3,000.00
For the purchase of one set of mekometers	Sept. 6	110.00
For the purchase, by the Chief of Ordnance, of 1,000 pounds of powder from the powder works at Cologne, Germany, suitable for test in the 8-inch B. L. rifle	Oct. 25	1,500.00
For the necessary expenses of the Board (not including salary of civilian member, which was expended under appropriation of July 23, 1892) from October 31, 1892, to July 31, 1893 (balance of appropriation)*	.....	1,778.30
Total	.....	142,858.30

*See act of July 23, 1892, for further necessary expenses of Board from October 31, 1892, to October 31, 1893.

Allotted and expended to October 31, 1892 (see Second Annual Report)	$3,665,750.20
Allotted and expended from October 31, 1892, to October 31, 1893	142,858.30
Total allotted and expended to date	3,808,608.50
Total appropriated under this act	3,832,935.00
Total allotted and expended	3,808,608.50
	24,326.50
Reappropriated from act of March 2, 1889	14,000.00
Balance available for allotment	38,326.50

ACT OF FEBRUARY 24, 1891.

Purpose of allottment.	Date.	Amount.
For carriages for steel breech-loading seacoast guns, procured under fortification act approved September 22, 1888	1892. Nov. 14	$65,000.00
For the purchase of 1 2-barrel .45 caliber Robertson machine gun	Nov. 14	1,000.00
For carriages for howitzers of 7-inch caliber	Nov. 16	35,000.00
Additional for cost of procuring smokeless powder for experimental purposes	Dec. 29	2,000.00
For erection of suitable shelter for Lewis position finder at Fort Wadsworth, together with unexpended balance of allotment of May 3, 1892, made for the purchase of the instrument	1893. Jan. 24	95.00
For the purpose of purchasing and erecting a representative steel deck plate for experimental purposes	Jan. 24	4,800.00
For the purpose of making proposed change in the manufacture of the 8-inch Haskell multicharge gun, in addition to the $55,000 heretofore allotted for the manufacture of the gun	Jan. 24	807.80
For the purpose of finishing the Haskell 8-inch multicharge gun, embodying the modifications proposed by Mr. Haskell in his letter of Jan. 21, 1893	Feb. 23	23.06
For the additional cost incident to changes in the 8-inch Haskell multicharge gun	Apr. 13	640.60
For the purchase abroad and expense of transportation of one Watkins depression range-finder suitable for an altitude of 150 feet	Feb. 23	175.00
For the purchase of one Whistler elevating arc	Feb. 23	150.00
To enable the Chief of Ordnance to provide telephonic communication between stations in the tests of range-finders	Apr. 13	60.00
For the purchase, by the Chief of Ordnance, of one "Aide-Tireur" range-finder	Apr. 14	175.00
For the purchase of two Greeley ink-writing district registers and one Greeley double-pen ink-writing district register by the Chief of Ordnance	Apr. 14	130.00
For the purchase of powders and projectiles for experimental firings with the 12-inch B. L. cast-iron hooped mortar	May 25	6,000.00
For the purchase of samples of smokeless powders for test in small arms and cannon	May 29	2,500.00
To enable the Chief of Ordnance to procure 500 rounds of ammunition, complete, for test of the 6-pounder Sponsel rapid-fire gun	July 12	1,900.00
For the purchase by the Chief of Ordnance of 500 rounds of ammunition for test of the 6-pounder Maxim-Nordenfelt rapid-fire gun	Sept. 5	2,000.00

Table showing allotments made by the Board of Ordnance and Fortification from October 31, 1892, etc.—Continued.

ACT OF FEBRUARY 24, 1891—Continued.

Purpose of allotment.	Date.	Amount.
For the purpose of establishing direct telegraphic communication between Forts Hamilton and Wadsworth, for experimental purposes	1893. Sept. 6	$1,275.00
For the transfer of the Lewis range-finder to another position at Fort Wadsworth, and for providing proper protection for the instrument	Sept. 6	250.00
For the purchase and erection of a representative steel deck plate for experimental purposes in working up deck-piercing shell	Sept. 6	4,800.00
For the test of the Robertson 2-barrel .45-caliber machine gun	Oct. 24	175.00
For the purchase of ammunition and test of the Hotchkiss 6-pounder rapid-fire gun	Oct. 24	1,800.00
For the test of the Bryan multicharge gun	Oct. 24	515.00
To complete the Haskell 8-inch multicharge gun	Oct. 25	421.30
For the preparation of a map of New York Harbor, designed to be used in the construction of range-finders	Oct. 25	150.00
Total		130,042.76

Allotted to October 31, 1892 (see Second Annual Report)	$2,160,320.78
Allotted from October 31, 1892, to October 31, 1893	130,042.76
Total allotted	2,290,363.54
Total appropriated under this act	2,290,803.00
Total allotted	2,290,363.54
Balance available for allotment	439.46

ACT OF JULY 23, 1892.

Purpose of allotment.	Date.	Amount.
For the purpose of strengthening the wharf at the Sandy Hook proving ground, to enable guns to be used for experimental purposes to be taken over the same	1892. Nov. 14	$2,500.00
For the purpose of procuring, mounting, and experimenting with the 12-inch gun-lift carriage adapted for use with the gun lift	Nov. 15	25,000.00
For tests of 12-inch mortar carriages, including minor alterations and repairs, and incidental expenses	Nov. 16	10,000.00
For tests of 8-inch barbette and disappearing carriages, including minor alterations and repairs, and incidental expenses	Nov. 16	18,000.00
For test of 10-inch disappearing carriages, including minor alterations and repairs, and incidental expenses	Nov. 16	20,000.00
For repairs or alterations to the 12-inch gun-lift carriage	Nov. 16	2,000.00
For tests of 12-inch barbette carriage, including minor alterations and repairs, and incidental expenses	Nov. 16	12,000.00
For tests of 7-inch howitzer carriage, including minor alterations and repairs, and incidental expenses	Nov. 16	3,500.00
For tests of 7-inch mortar carriage, including minor alterations and repairs, and incidental expenses	Nov. 16	4,500.00
For completing test of Crozier 10-inch wire-wound gun to 300 rounds	Nov. 16	10,000.00
For completing test of Woodbridge wire-wound gun to 300 rounds	Nov. 16	12,000.00
For completing test of 12-inch steel mortar to 400 rounds	Nov. 16	10,000.00
For experimental powders	Nov. 16	6,000.00
For purchase of 500 rounds of ammunition, complete, for the test of the Seabury 6-pounder rapid-fire gun	Dec. 29	2,000.00
For changes in and erection of the Fiske range finder at Fort Wadsworth, New York Harbor	1893. Sept. 6	930.00
To enable the Chief of Ordnance to make the modifications in the Lewis range and position finder, as indicated in the letter of Lieut. Lewis of Oct. 18, 1893	Oct. 24	200.00
For the purchase or manufacture of wheels for the 5-inch siege Raskazoff carriage	Oct. 24	80.00
For the erection of a platform for the 12-inch Gursonwerk minimum port carriage, including the setting up and assembling of the carriage thereon	Oct. 24	4,500.00
For the purchase and erection of 1 deck plate at the Sandy Hook proving ground for testing experimental deck-piercing mortar shell	Oct. 24	4,600.00
For the test of the 12-inch B. L. rifle with nickel-steel tube	Oct. 24	20,500.00
For the manufacture of a carriage and platform for the experimental 7-inch siege B. L. mortar	Oct. 24	500.00
For the purchase, by the Chief of Ordnance, of a field glass for use with the Gordon range-finder	Oct. 25	40.00
For the test of the 7-inch B. L. mortar, steel	Oct. 25	4,200.00
For the purchase, by the Chief of Ordnance, of one search-light apparatus, complete, of 150 cm. mirror diameter, for seacoast defense, to be tested at the Sandy Hook proving ground	Oct. 25	5,900.00

Table showing allotments made by the Board of Ordnance and Fortificaton from October 31, 1892, etc.—Continued.

ACT OF JULY 23, 1892—Continued.

Purpose of allotment.	Date.	Amount.
	1893.	
For the purchase, by the Chief of Ordnance, of 20 Gillespie and Breuchaud detonators	Oct. 25	$200.00
For necessary expenses of board, including salary of civilian member, from Oct. 31, 1892, to Oct. 31, 1893		6,184.58
Total		185,334.58

Allotted and expended to Oct. 31, 1892	$1,666.66
Allotted and expended from Oct. 31, 1892, to Oct. 31, 1893	185,334.58
Total allotted and expended to date	187,001.24
Total appropriated under this act	210,000.00
Total allotted and expended	187,001.24
Balance available for allotment	22,998.76

ACT OF FEBRUARY 18, 1893.

Purpose of allotment.	Date.	Amount.
	1893.	
For increasing facilities for experimental work at the Sandy Hook proving ground by building a railroad from the proving battery to the New Jersey Central Railroad	Sept. 6	$11,500
Additional for above purpose	Oct. 27	500
For purchase by the Chief of Ordnance of 100 rounds of ammunition, complete, with ordinary cast-iron shell, for the test of the 12-cm. Schneider quick fire gun	Sept. 7	4,000
For the purchase of one Gordon disappearing 10-inch gun carriage in general features of the design submitted in the letter of Capt. Gordon of Sept 5, 1893	Sept. 7	47,700
For the foundation, for the transportation, and for the erection at the Sandy Hook proving ground of the modified Gordon 10-inch disappearing carriage	Oct. 24	10,650
Total		74,350

Total appropriated under this act	$125,000
Total allotted to date	74,350
Balance available for allotment	50,650

SUMMARY TO OCTOBER 31, 1893.

Appropriation.	Total appropriations.	Total allotments, expenditures, and reverting to Treasury.	Total balances on hand not allotted or expended.	Total allotments and expenditures from Oct. 31, 1892, to Oct. 31, 1893.
Fortification act Sept. 22, 1888	$3,972,000.00	$3,971,753.33	$246.67	$19,453.29
Army appropriation Mar. 2, 1889	56,000.00	{ 3,156.20 52,843.80		
Fortification act Mar. 2, 1889	1,233,594.00	1,194,819100	24,775.00	
Fortification act Aug. 18, 1890	3,832,935.00	3,808,608.50	38,326.50	142,858.30
Fortification act Feb. 24, 1891	2,290,803.00	2,290,363.54	439.46	130,042.76
Fortification act July 23, 1892	210,000.00	187,001.24	22,998.76	185,334.58
Fortification act Feb. 18, 1893	125,000.00	74,350.00	50,650.00	74,350.00
Total	11,720,332.00	11,582,895.61	*137,436.39	552,038.93

*Of this amount $47,665 is by law for specific purposes, leaving subject to allotment but $89,771.39 for general experimental work between now and the 1st of July next.

Total allotments	$11,511,644.37
Total expenditures for necessary expenses of Board	18,407.44
Total turned into Treasury	443.80
Total reverting to Treasury by lapse of appropriation	52,400.00
Grand total	11,582,895.61

APPENDIX B.

THE ORDNANCE BOARD, U. S. ARMY,
NEW YORK ARSENAL,
GOVERNORS ISLAND, NEW YORK HARBOR,
New York City, September 22, 1893.

SIR: The following report of the test of the Gordon disappearing carriage is respectfully submitted:

This carriage is designed for the 10-inch B. L. rifle, steel, and consists of a heavy bedplate supporting two side frames which carry the movable parts on journals, and a pivot plate permanently fastened to the under surface of the bedplate, the whole resting on a heavy cast-iron platform or traverse circle.

The gun is mounted on a top carriage, somewhat similar in form to the top part of the old style barbette carriage. Four double cranks are journaled in the side frames, two on each side. The top carriage is mounted on the inner and longer of the crank arms by means of two cross shafts journaled in the top carriage, the ends of the shafts being securely fastened to the crank arms. A counterpoise frame is mounted on the outer and shorter arms. During recoil the gun, top carriage, and counterpoise rotate about their journals, the gun and top carriage describing an arc of about 180° to reach the loading position, while the counterpoise describes an equal and opposite arc, rising while the gun falls. The gun, top carriage, and counterpoise remain parallel to their original positions throughout the motion.

The elevating device is attached to the top carriage and is independent of any other part of the construction.

The carriage is lifted on an oil pivot for traversing, and a small hydraulic pump is provided for the purpose. Except when raised for traversing the carriage is in complete contact with its platform.

Between the side frames and secured to the top surface of the bedplate are two hydraulic cylinders 12 inches in diameter. Above and across the front end of these cylinders is an air chamber, separated from the cylinders by check valves opening toward the air chamber. A bypass valve is provided for opening communication from the air chamber to the cylinders around the check valves.

The outer ends of the piston rods are carried by a wheeled truck which runs on rails fastened to the bedplate. From the shafts on which the top carriage is journaled two parallel connecting rods extend to the truck which carries the piston rods. During the recoil these connecting rods close like parallel valves and run the truck and piston rods to the front, thus forcing the liquid from the cylinders through the check valves into the air chamber. Thus the energy of recoil is stored in the air chamber, and it may be utilized in lifting the gun to the firing position. The bypass valve is opened for this purpose. A small air pump is provided to give the required initial pressure in the air chamber.

For the purpose of maneuvering the carriage by hand a system of gearing is attached to each side of the counterpoise frame, and small

platforms are provided for the men required in maneuvering. The gearing turns a pinion which meshes into a circular rack fixed to the side frame. The radius of this rack is equal to the length of one of the arms upon which the counterpoise is mounted.

The rear transom of the counterpoise frame is used as a loading platform. A charge is secured to the latter when the counterpoise is in its lowest position, and this charge is lifted to the loading position by the recoil.

The carriage is very massive, the counterpoise alone weighing upwards of 70 tons. The main parts are of cast iron. The cheeks of the top carriage and the cranks and journals are of steel.

The carriage was tested in accordance with the following programme, approved by the Chief of Ordnance, viz:

1. The time required to raise the carriage from the firing to the traversing position to be noted and the number of men necessary.
2. The facility with which the piece may be traversed and the number of men necessary to be noted.
3. The time from passing from elevation —5° to that of +20° and the number of men necessary to be noted.
4. Six rounds to be fired with charges to be determined by the Board and the air pressures required for the different charges to be noted.
5. During the firing of the above rounds the time required for the following operations and the number of men necessary to be noted.
(*a*) For bringing the gun from the loading position to that for charging the air reservoir.
(*b*) For charging the air reservoir with the gun at the highest position at which it would be concealed from the view of the enemy to the pressure required for firing half charge.
(*c*) For charging as above to the pressure required for full charge.
(*d*) For bringing the piece from the charging to the loading position.
(*e*) For bringing the piece from the charging to the firing position.
(*f*) For loading.
(*g*) For raising from the loading to the firing position.
(*h*) For bringing from the recoil to the loading position.
6. One round with full charge to be fired at each of the elevations —5°, 0°, +10° and +20°.
7. Ten rounds with full charges to be fired as rapidly as possible and the time noted.

Preliminary to the official test Capt. Gordon was, by authority of the Chief of Ordnance, allowed to fire 20 rounds to develop the working of the carriage and to make such minor alterations and repairs as might be found necessary.

Of thes 20 rounds numbers 1 to 15 inclusive were utilized by Capt. Gordon, and during these firings the following changes were found necessary for the convenient working of the carriage.

The inside gear wheels of raising apparatus were broken and it was necessary to replace them with stronger ones, also the cast-iron lifting arcs were found to be too weak, and they were replaced by those of bronze.

The counterpoise was found to be too light and was made heavier as follows: Two plates weighing 2,000 pounds each were bolted to the front transom of the counterpoise frame. To the front end of each counterpoise was bolted a plate weighing 2,000 pounds, and to the rear end of each counterpoise a plate weighing 4,000 pounds, and four 12-inch shot, each weighing 800 pounds, were fastened to the under side of the rear transom of the counterpoise frame. This arrangement did not appear, however, to accurately balance the system, and at the points where the cranks attached to the counterweights were horizontal one end of the counterweight moved more rapidly than the other, thus making the cranks work against each other, locking the system, and a pry had to

be used to move the rear part of the counterweight over the "dead center." To remedy this defect two brackets were fastened to the bed of the carriage, a stud being attached to each bracket; a stud was also fastened to each counterweight, located so that the distance from center to center of the studs on bracket and counterweight when the cranks were horizontal or perpendicular was 2 feet 10 inches. These studs were connected two and two by links, the distance between the holes in the links embracing the studs being 2 feet 10 inches. This arrangement caused the counterweights to move parallel to themselves in all positions and prevented the locking of the system as above described. It should be noted that this "locking" occurred only when the gun was raised by hand power alone. Subsequently when the air pressure was utilized in assisting the raising of the gun no "binding" occurred although the links were removed.

The loading platform composed of the rear transom of the counter poise frame was found to be too near the breech of the gun for convenience in loading; the portion of this platform just in rear of the gun was therefore cut away, and a new loading platform provided, lowered 2 feet 5 inches and placed 2 feet 4 inches farther to the rear. This arrangement allowed ample room for the gun crew to operate when ramming the projectile to its seat in the gun. A platform was also attached to the gun by bands encircling the gun near the breech. This platform was found convenient for the gunner charged with the duty of closing the breechblock and putting the primer in place ready for firing.

Great difficulty was experienced in the use of the pumps provided with the carriage to raise the latter to its firing position and to secure the pressure in the air chamber necessary to properly control the recoil. Many changes were made in these pumps but without avail, and they were finally replaced by the pump belonging to the Canet carriage for 12-inch B. L. mortars. This pump was attached to the carriage in rear of the air chamber and over the hydraulic cylinders and so adjusted that air or liquid could be pumped at pleasure. This pump was found to be a great improvement over those originally provided with the carriage.

The alterations and improvements above described having been made the official test began on the 13th of July, when the round at 10° elevation was fired in the presence of the Board of Ordnance and Fortification, but owing to the absence of members of the Ordnance Board and press of other work, further test was not begun until August 9, on which date the items of the programme were taken at as nearly as possible in their order of sequence, as follows:

1. The time required to raise the carriage from the firing to the traversing position was, on first trial, one minute thirty seconds. On examination, however, it was found that the cock to the pivot cylinder was not completely open; a new trial was therefore given, the time being thirty seconds; eight men were working at the pump.

2. The facility with which the carriage might be traversed could not be ascertained with certainty, owing to the fact that the platform on which the carriage was mounted had, during the preliminary firing, settled on one side, so that its upper surface was not horizontal. This caused the pintle to bind in its seat, and prevent the traversing of the carriage except through a few degrees. From the limited trial that could be made it is the opinion of the Board that the traversing can, under normal conditions, be done with difficulty by two men at one end of the counterpoise, and with ease by four men, two at each end of the

counterpoise. It would be an advantage, however, to have some means provided for the application of power in traversing.

3. The time required from passing from elevation of $-5°$ to $+20°$ was one minute fifteen seconds, four men being required.

4. Six rounds were fired, with charges determined by the Board, and the air pressures required were noted as follows:

No. of round.	Weight of charge.	Powder pressure per square inch.	Air pressure before firing.	Air pressure after firing.
		Pounds.	*Pounds.*	*Pounds.*
1	125	15,250	47½	77½
2	125	14,165	35	64
3	125	11,835	25	54
4	125	19,500	20	60
5	250	*60,000	90	245
6	225	58,500	70	210

*Over 60,000.

5. The times required for the first four operations under No. 5 were not taken, as it was found that the air chamber could be charged with the gun in the loading position, the contrary being the supposition when the programme was prepared. The time required to properly charge the air chamber for a half charge (125 pounds) of powder was found to be nine minutes, and for a full charge (250 pounds) of powder forty-one minutes eighteen seconds, ten men working at the pump. The details for each five minutes are contained in the record.

(*f*) The gun being in loading position, the time required to load was determined to be one minute forty-three seconds.

(*g*) The time required to raise the gun from loading position was two minutes seven seconds, the pressure in the air chamber at start being 134 pounds and at firing point 47½ pounds.

(*h*) As the gun uniformly recoiled to loading position, this time was not taken.

6. The round at $-5°$ could not be fired, there being no butt available for the purpose. The rounds at 0°, 10°, and 20°, are Nos. 22, 15, and 23 of the record.

7. The final firings were made for rapidity on September 13. Ten rounds were fired to sea, six being continuous, without delay on account of ships or other obstructions. The actual time required for the ten rounds was determined to be fifty-eight minutes and twenty-eight seconds. The details for each round are contained in the record.

In the course of the tests above described 33 rounds have been fired, with varying charges, as follows:

No. of rounds.	Weight of charge.
	Pounds.
1	100
8	125
1	150
1	175
1	200
2	225
5	240
3	245
11	250
33	

CONCLUSIONS.

The Board, having carefully noted the action of the carriage throughout the test, are of the opinion that it possesses many valuable features which make it superior to any carriage for a similar purpose thus far known to the Board. This superiority consists primarily in the fact that the operations of raising and lowering the gun, elevating, and traversing can be performed with comparative ease and quickness without the use of machinery or appliances other than those which can be worked by hand. By the application of machinery these operations could no doubt be performed with still greater certainty and rapidity. The fact, however, that it is possible to perform them by hand, and that under these circumstances ten rounds can be fired with ease in less than one hour, is considered a remarkable achievement, marking an epoch in the history of the construction in this country of carriages for high-power guns.

The working of the carriage was smooth and regular to a marked degree, confirming the claim of the designer that the system, as a whole, is one of nonrecoil.

The carriage has disadvantages, some of which can be overcome and others are inherent to the system. It is somewhat heavy and cumbersome, lacking in compactness, and the parts in rear of the gun are so arranged as to prevent easy access to the breech for loading purposes. The necessity for putting the raising apparatus out of gear before firing was a source of considerable trouble, and if the operation were neglected would cause disaster. These objections could be overcome in a new construction.

The use of pumps for raising the system to the traversing position and obtaining the necessary initial air pressure is a disadvantage inherent to the design. These pumps, with their complicated valves and packing, are liable to get out of order and require experts to keep them in good condition. Endless trouble was experienced with the pumps furnished with the carriage. The use of the Canet pump was a great improvement, and the tests demonstrated that great care must be taken to select a strong, simple, and effective pump in order to insure the efficient and reliable working of the carriage.

As a result of these tests the Board is of the opinion that the Gordon disappearing carriage, mounted on a proper platform, possesses many advantageous and desirable features, and it is thought that with the modifications requisite to overcome the defects noted during the trial it will prove a suitable carriage for issue to the service.

CLIFTON COMLY,
Major, Ord. Dept. U. S. Army, President.
FRANK HEATH,
Captain, Ord. Dept. U. S. Army.

The CHIEF OF ORDNANCE, U. S. ARMY,
Washington, D. C.

Record of firing with 10-inch B. L. rifle (steel) No. 1, Watervliet Arsenal,

[Object of firing,

Date.	Number of prisms.	Number of fire on carriage.	No. of fire.	Powder.		Projectile.		Travel of shot in bore.	Elevation.
				Kind.	Weight.	Kind.	Weight.		
1892. A. M.				Dupont's brown prismatic V. U. Lot 7; density, 1.835.	*Pounds.*	Cored shot. Lot 324.	*Pounds.*	*Inches.*	° ′
Dec. 21		1	178		125 1,338 prisms, brown. 7 prisms, black.		575, including sand.	244.55	2 00

[Object of firing

1893. P. M.				Du Pont's brown prismatic V. U. Lot 7; density, 1.835.		Cored shot. Lot 324.			
Jan. 27	Brown... 1,070 Black.... 7	2	179		100		575, including sand.	254.15	2 00

at Sandy Hook, N. J., from December 21, 1892, to September 13, 1893.

test of carriage.]

Pressure per square inch of bore.	Recoil.	Wind, strength, and direction.	Counter recoil.	Special remarks about each fire, such as effect on piece, action of breech mechanism, consumption of powder, sound of projectile in flight, scattering of fragments, etc., and meteorological data.	General remarks.
Pounds.	*Ft. In.*	From right and rear, 16 miles an hour.	*Ft. In.*	Barometer, 30.45; thermometer, 30°; humidity, 79. In recoiling, crosshead of the piston came up against cylinder head, shearing off two small webs on each side. Left main web of crosshead cracked all the way through. Cast iron portion of lower bearings of the front connecting rod broken. One tooth of right lifting arc broken in raising gun. Copper cylinder of 9,000 pounds initial compression and tables of 1890.	Gun mounted on Gordon disappearing carriage. Obturating friction primers. Fired to sea. When carriage was in firing position the piston rod was 8 feet out of cylinder. Rear clamp of shot tray not of proper diameter. It was removed for repairs. Before test two teeth of left arc for raising gun broken. Air-gauge pressure before firing, 0; air-gauge pressure after firing, 75 pounds. 172 gallons neutral oil put in cylinder. Firing conducted by Lieut. E. St. J. Greble, Second Artillery, in the presence of the Ordnance Board. Present: Maj. C. Comly, Ordnance Department; Capt. F. Heath, Ordnance Department; Capt. W. Crozier, Ordnance Department.
P, 13,000; Z, 14,140, in mushroom head. S, 24,100, loose.	.....		.....		

proof of carriage.]

C, 9,100 D, 9,830	5 2	From rear, 8 miles an hour.	Not noted.	Barometer, 30.46; thermometer, 34°; humidity, 90. Air pressure before firing, 42 pounds. Air pressure after firing, 95 pounds; fell to 86 pounds. The large inside gear wheel of raising apparatus on right side broken while raising; jack used to assist in raising gut. Copper cylinders of 9,000 pounds initial compression and tables of 1890.	Gun mounted on Gordon disappearing carriage. Obturating friction primers. Fired to sea. Recoil means travel of piston rod in hydraulic cylinder. Since last firing, side castings of truck carrying piston rods replaced and rubber buffers were lengthened 3 inches. Recoil permitted by carriage is 7 feet 8 inches. Firing conducted by Lieut. C. B. Wheeler, Ordnance Department, in the presence of the Ordnance Board,. Present: Maj. C. Comly, Ordnance Department; Capt. F. Heath Ordnance Department; Capt. W. Crozier, Ordnance Department.

Record of firing with 10-inch B. L. rifle (steel) No. 1, Watervliet Arsenal,

[Object of firing,

Date.	Number of prisms.	Number of fire on carriage.	No. of fire.	Powder.		Projectile.		Travel of shot in bore.	Elevation.
				Kind.	Weight.	Kind.	Weight.		
1893.					*Pounds.*		*Pounds.*	*Inches.*	° ′
Feb. 17	Brown... 1,328 Black.... 7	3	180	Du Pont's brown prismatic V. U. Lot 7; density, 1.835.	125	Cored shot. Lot 324.	569 6 sand. 575	254.75	3 5
Feb. 21	Brown... 1,607 Black.... 7	4	181		150		570 5 sand. 575	254.95	15 00
Feb. 21	Brown... 1,877 Black.... 7	5	182		175		565 10 sand. 575	254.75	15 00

at Sandy Hook, N. J., from December 21, 1892, to September 13, 1893—Continued.

test of carriage.]

Pressure per square inch of bore.	Recoil.	Wind, strength, and direction.	Contour recoil.	Special remarks about each fire, such as effect on piece, action of breech mechanism, consumption of powder, sound of projectile in flight, scattering of fragments, etc., and meteorological data.	General remarks.
Pounds.	*Ft. In.*		*Ft. In.*		
A, less than 14,000. X, 14,000.	3 8	Feb. 17, from rear 2¼ miles an hour; Feb. 21, from right and rear 8 miles an hour.	Not noted.	Barometer, 30.25; thermometer, 21°; humidity, 86. Air pressure before firing, 50 pounds. Air pressure after firing, 85 pounds. Ten men working on handles, 5 on each side. Pressure assisted in raising gun: men pumped air during raising. Gun did not come down to loading position. Key in left rear crank left out and crank moved over about ¼ inch. This had to be repaired before next round	Gun mounted on Gordon disappearing carriage. Obturating friction primers. Since last firing the system was weighted as follows: Two plates, weighing 2,000 pounds each, bolted to front plate attached to counterweights. In front on each side of counterweights a plate weighing 2,000 pounds each. In rear on each side of counterweights a plate weighing 4,000 pounds each, and four 12-inch shot, weighing 800 pounds each, two on each side of platform in rear.
A, 16,000 X, 16,300	4 9⅜		5⅝	Air pressure before firing, 50 pounds. Air pressure after firing 92 pounds. Eight men on handles, 4 on each side. Pressure assisted in raising. Actual time of raising, 3 minutes 15 seconds. The system not being accurately balanced during raising and at a point where cranks attached to counterweights are horizontal; one end of the counterweight moves more than the other, thus making cranks work against each other, locking the system. The front end of counterweight seems to be the heavier, and a pry had to be used to move the rear part of counterweights over this "dead center." This caused a delay of 10 minutes. Gun did not come down to loading position.	The counter recoil is probably due to check valves not acting quickly enough. The elevating band on 10-inch gun used for elevating with the pneumatic disappearing carriage makes a great preponderance to the rear and men go out on the muzzle to assist in depressing gun for loading. Copper cylinders of 4,000 pounds inititial compression and tables of 1892. Before firing of the 17th. Broken gear wheels replaced by new ones, and lifting arcs replaced by those of bronze.
A, 20,200 X, 20,200	5 10		4¾	Gun loaded from position of rest after last round by means of gin. Air pressure before firing, 50 pounds. Air pressure after firing, 110 pounds; fell to 100 pounds. Eight men on handles, 4 on each side. Pressure assisted in raising. Actual time of raising, 2 minutes 30 seconds. The system locked, as it did in previous round. Gun did not come down to loading position. Observed time of flight, 24½ seconds.	The counter recoil is probably due to check valves not acting quickly enough.

Record of firing with 10-inch B. L. rifle (steel) No. 1, Watervliet Arsenal, at

[Object of firing,

Date.	Number of prisms.	Number of fire on carriage.	No. of fire.	Powder.		Projectile.		Travel of shot in bore.	Elevation.
				Kind.	Weight.	Kind.	Weight.		
1893.					*Pounds.*		*Pounds.*	*Inches.*	° ′
Feb. 21	Brown... 2,147 Black.... 7	6	183	Du Pont's brown prismatic V. U. Lot 7; density, 1.835.	200	Cored shot. Lot 324.	569 6 sand. 575	254.75	12 00
Feb. 21	Brown... 2,397 Black.... 7	7	184		225		570 5 sand. 575	254.85	10 00
Feb. 2	Brown.... 2579 Black..... 7	8	185		240		566 9 575 sand.	254.75	10 00
Feb. 24	Brown.... 2627 Black..... 7	9	186		245		569 6 575 sand.	254.75	10 00 *11 30

* After firing.

Sandy Hook, N. J., from December 21, 1892, to September 13, 1893—Continued.

test of carriage.]

Pressure per square inch of bore.	Recoil.	Wind, strength, and direction.	Counter recoil.	Special remarks about each fire, such as effect on piece, action of breech mechanism, consumption of powder, sound of projectile in flight, scattering of fragments, etc., and meteorological data.	General remarks.
Pounds.	*Ft. In.*		*Ft. In.*		
A, 24,666 X, 24,666	6 11¾	From rear and right 8 miles an hour.	5¾	Barometer, 30.20; thermometer, 15; humidity, 86. Gun loaded from position of rest after last round by means of gin. Air pressure before firing, 50 pounds. Air pressure after firing, 145 pounds; fell to 135 pounds. Eight men on handles, 4 on each side. Pressure assisted in raising. Actual time of raising, 2 minutes 12 seconds. The system locked, as it did in previous two rounds. Gun came nearly to loading position. Observed time of flight, 20¾ seconds. Copper cylinder of 18,000 pounds initial compression and tables of 1890.	Firing conducted by Lieut. C. B. Wheeler, Ordnance Department, in the presence of the Ordnance Board. Present: Capt. F. Heath, Ordnance Department.
A, 29,477 X, 29,667	7 1⅞		7½	Air pressure before firing, 64 pounds. Air pressure after firing, 190 pounds; fell to 165 pounds. Eight men on handles, 4 on each side. Pressure assisted in raising. Time of raising, 3 minutes, without stop. Gun came almost down to loading position. Observed time of flight, 18¾ seconds. Copper cylinders of 24,000 pounds initial compression and tables of 1890.	
A, 34,400 X 34,314	7 2½	From rear 23 miles an hour.	6½	February 24, barometer, 29.80; thermometer, 36°; humidity, 82. Air pressure before firing 50 pounds. Air pressure after firing 215 pounds fell to 200 pounds. Nine men on handles, 4 on right and 5 on left side. Time of raising, 7 minutes 15 seconds. Time of flight, 20 seconds. Time fired, 3:10 p. m. Rear clamp of shot tray broken off at hinge. Glass over face of gauge broken by blast. Four bolts holding front elevating worm bracket all sheared off and bracket moved 2 inches to the front; bevel gear on rear end of worm shaft came off, but uninjured. Bracket replaced temporarily for next round.	Gun mounted on Gordon disappearing carriage. Obturating friction primers. Five gallons of oil added. Fired to sea. Copper cylinders of 32,000 pounds initial compression and tables of 1892. Front elevating band slipped forward and had to be driven back after each round. Before firing of February 25 four new bolts put in elevating worm bracket and a piece of iron bolted down to carriage in front of bracket to prevent it slipping forward.
A, 35,033 X 35,477	6 10½		7½	Air pressure before firing, 90 pounds. Air pressure after firing, 250 pounds fell to 210. Nine men on handles, 4 on right and 5 on left side. Time of raising, 6 minutes. Time of flight 19½ seconds. Time of firing, 5:15 p. m. Elevating worm bracket slipped forward.	

Record of firing with 10-inch B. L. rifle (steel) No. 1, Watervliet Arsenal, at

[Object of firing,

Date.	Number of prisms.	Number of fire on carriage.	No. of fire.	Powder. Kind.	Powder. Weight.	Projectile. Kind.	Projectile. Weight.	Travel of shot in bore.	Elevation.
1893.					*Pounds.*		*Pounds.*	*Inches.*	° ′
Feb. 25	Brown.... 2685 Black..... 7	10	187	Du Pont's brown prismatic V. U. Lot, 7; density, 1.835.	250	Cored shot. Lot 324.	570 5 sand. 575	254.75	10 00 *10 05
Mar. 1	Brown.... 2664 Black..... 7	11	188		250		570 5 sand. 575	254.75	10 00 *10 00
Mar. 2	Brown.... 2675 Black..... 7	12	189		250		570 5 sand. 575	254.75	10 00 *10 00
Apr. 28	Brown.... 1328 Black..... 7	13	190		125 00		570 5 sand. 575	254.40	2 00

*After firing.

Sandy Hook, N. J., from December 21, 1892, to September 13, 1893—Continued.

test of carriage.]

Pressure per square inch of bore.	Recoil.	Wind, strength, and direction.	Counter recoil.	Special remarks about each fire, such as effect on piece, action of breech mechanism, consumption of powder, sound of projectile in in flight, scattering of fragments, etc., and meteorological data.	General remarks.
Pounds.	*Ft. In.*		*Ft. In.*		
A, 36,400 X 36,700	6 11	From near 14 miles an hour.	6½	February 25, barometer, 30.10t thermometer, 36°; humidiy; 82. Air pressure before firing, 90 pounds. Air pressure after firing, 2.75 fell to 250 pounds. Seven men on handles, 4 on right and 3 on left side. Time of raising, 10 minutes 30 seconds. Time of flight, 20 seconds. Time of firing, 1:45 p. m.	
A 361,33 X 36,100	7 3¾	Mar. 1, from right and rear 22 miles an hour. Mar. 2, from right 26 miles an hour.	4½	Mar. 1, barometer, 30.06; thermometer, 38; humidity, 75. Air pressure before firing, 80 pounds. Air pressure after firing, 270 pounds fell to 250 pounds. Eight men on handles, 4 on each side. Time of raising not taken. Time of flight, 20 seconds. Front clamp of shot tray broken off near hinge.	Four springs under the connecting-rod bearings of the top carriage removed. Fired to sea. Copper cylinders of 32,000 pounds initial compression and tables of 1892. Firing conducted by Lieut. E. St. J. Greble, Second Artillery, in the presence of the Ordnance Board. Present: Maj. C. Comly, Ordnance Department, Capt. F. Heath, Ordnance Department.
A 4,900 X 34,350	7 4		5	Mar. 2, barometer, 30 07; thermometer, 38; humidity, 75. Air pressure before firing, 80 pounds. Air pressure after firing, 255 fell to 245 pounds. Eight men on handles, 4 on each side. Time of raising, 3 minutes. Time of flight, 19¾ seconds.	
.....	Not taken.	.....	Not taken.	Barometer, 30; thermometer 52°; humidity, 71. Air pressure before firing 33 pounds equals one point of hydraulic gauge. Glass face over gauge broken by blast. In recoiling gun came down nearly to loading position and then rose up part way and remained.	Gun mounted on Gordon disappearing carriage. Obturating friction primers. Fired to sea. Twenty gallons of neutral oil added to cylinders before firing. Before this firing handles on wheel of oil pump lengthened. Enlarged pistons from 1 to 1 3/16 inches. Put in new valves ¾ inch in diameter in place of ⅝-inch valves. Two links to brackets on frame made and two studs on counter weights made. Cut out rear platform and put in new one and lowered it 2 feet 5 inches and extended it 2 feet 4 inches to the rear. A tell-tale for cylinder to see how much oil there is in cylinder made and fitted.

Record of firing with 10-inch B. L. rifle (steel) No. 1, Watervliet Arsenal, at

[Object of firing,

Date.	Number of prisms.	Number of fire on carriage.	No. of fire.	Powder. Kind.	Powder. Weight.	Projectile. Kind.	Projectile. Weight.	Travel of shot in bore.	Elevation.
1893.				Du Pont's brown prismatic V. U. Lot 7; density, 1835.	*Pounds.*	Cored shot. Lot 324.	*Pounds.* 569 6 sand. 575	*Inches.*	° ′
P. M. May 26	.....	14	9		250			254.375	16 45

[Object of firing, exhibition before the

July 13	.....	15	192	Du Pont's Brown prismatic V.U. Lot 7; density, 1.835.	250	Cored shot. Lot 324.	570 5 sand. 575	254.25	10 00

Object of firing,

July 14	.....	16	193	Du Pont's brown prismatic U. U. Lot 7; density, 1.835.	125	Cored shot. Lot 324.	569 6 sand 575	254.125	10 00

Sandy Hook, N. J., from December 21, 1892, to September 13, 1893—Continued.

test of cartridge.]

Pressure per square inch of bore.	Recoil.	Wind, strength, and direction.	Counter recoil.	Special remarks about each fire, such as effect on piece, action of breech mechanism, consumption of powder, sound of projectile in flight, scattering of fragments, etc., and meteorological data.	General remarks.
Pounds.	*Ft. In.*		*Ft. In.*		
{ P. 37,800 { 4 36,650	.....	.....	.....	Air pressure before firing, 80 pounds, and dropped to 60 pounds while waiting for ships to get out of range. (This in about 30 minutes.) Pressure pumped up again to 80 pounds just before firing. Air pressure after firing not recorded; indicator on face of gauge blown off. The hydraulic pump was removed before this firing. The carriage was raised from its platform by two 2-inch planks in front, and two 2-inch planks in rear of the pivot, these planks being placed between the bedplate and the platform.	Gun mounted on Gordon disappearing carriage Obturating friction primer. Ten gallons of oil added. Fired to sea. Before firing the piston rod was 8 feet out of cylinder. After firing the piston rod was 3 feet 9½ inches out of cylinder. The string on piston rod was 1½ inches from its end, so that the recoil measured on the piston rod 7 feet 10½ inches. The counter recoil was 3 feet 8 inches. Firing conducted by Lieut. E. St. J. Greble, Second Artillery, U. S. Army, in the presence of the Ordnance Board. Present: Capt. F. Heath, Capt. W. Crozier.

Board of Ordnance and Fortification.]

{ U, 39,500 { N, 39,400	7 9½	.....	2 2½	Air pressure before firing 100 pounds. Air pressure after firing, 225 pounds. Gun came to buffers, raised slightly, and there remained The gun was again loaded and raised to firing position. Air pressure 65 pounds. As the pump could not be made to work the charge of powder was withdrawn and the piece secured copper cylinders of 32,000 pounds initial compression and tables of 1892.	Gun mounted on Gordon disappearing carriage. Obturating friction primers. Fired to sea. Before firing 105 gallons of neutral oil put in cylinders filling them. The lips of both cups turned off and seat made for split rings. Two split rings made and used on pad and one split ring on spindle. These modifications being similar to those shown by drawing for obturator of 12 inch rifle, steel, dated May 6, 1893. Firing conducted by Lieut. E. St. J. Greble, Second Artillery, in the presence of the Board of Ordnance and Fortification. Present: Maj. Gen. J. M. Schofield, Gen. H. L. Abbot, Col. H. W. Closson, Maj. C. Comly, Capt. C. C. Morrison, Mr. B. M. Cutcheon.

test of carriage.]

{ N, 11,670 { U, 12,600	4 ½	.....	1	Barometer, 30.13; thermometer, 76°; humidity, 66. Before this round the tin packing in air pump was removed and the air pump repaired. It took 10 men working three hours to get the carriage ready to fire after the pump was repaired. About 60 pounds was all the pressure that could be obtained. Copper cylinders of 9,000 pounds initial compression and tables of 1890.	Gun mounted on Gordon disappearing carriage. Obturating friction primers. Before this firing, 10 gallons of water and 20 gallons of oil added to cylinders to bring oil over check valves. Fired to sea. Firing conducted by Lieut. E. St. J. Greble, Second Artillery, in the presence of the Ordnance Board. Present: Capt. F. Heath, Ordnance Department; Capt. W. Crozier, Ordnance Department.

Record of firing with 10-inch B. L. rifle (steel), No. 1, Watervliet Arsenal, at

[Object of firing, test of Gor

Date.	No. of fire on carriage.	No. of fire.	Powder.		Projectile.		Travel of shot in bore.	Elevation.	Pressure per square inch of bore.	Recoil.	Counter recoil.
			Kind.	Weight.	Kind.	Weight.					
1893.				*Pounds.*		*Pounds.*	*Inches.*	° ′	*Pounds.*	*Ft. In.*	*Ft. In.*
Aug. 10	17	194	Du Pont's brown prismatic V. U. Lot 9; density, 1.850.	125	Cored shot. Lot 324.	570 5 sand. 575	254.25	10 00	N, 15,500 V, 15,000	4 ½	2½
Aug. 10	18	195		125		569 6 sand. 575	254.25	10 00	N, 14,300 V, 14,000	5 7½	1½
Aug. 10	19	196		125		569 6 sand. 575	254.25	10 00	N, 12,670 V, 11,000	5 7½	1½
Aug. 15	20	197		125		570 5 sand. 575	254.25	9 45	V, 19,450 X, 19,650	6	⅜

*Strokes varied from 120 to 160 half strokes per minute.
†140 half strokes per minute.
‡165 half strokes per minute.

Sandy Hook, from December 21, 1892, to September 13, 1893—Continued.

don disappearing carriage.]

Special remarks about each fire, such as effect on piece, action of breech mechanism, consumption of powder, sound of projectile in flight, scattering of fragments, etc., and meteorological data.

The gun was in the firing position. The Canet pump had been rigged to pump both air and liquid. It was on the left side of the carriage and just in rear of platform on counterweights. The connections of pump were so made that the air had to be pumped through liquid and check valves of air cylinder. A detachment of a noncommissioned officer and 12 men was used. The outer end of pinion shaft on left side of carriage was broken. The gun was first lowered to the loading position. Time, 6 minutes 30 seconds; 5 men on raising gear on each side.

Eight men then manned the pump, which was rigged to pump liquid. The carriage was raised to the traversing position. Time, 1 minute 30 seconds. The cock to pivot cylinder was not all the way open, so another trial was given. Three hundred pounds was kept on the pivot to hold it well up against carriage. The pressure was shut off from gauge.

When the pump was started (eight men working) the cocks to pivot and pump were opened wide. The pressure was 800 pounds. Time to raise carriage to traversing position, 30 seconds. The carriage was then traversed. It was then raised one-eighth inch higher; twelve strokes of the pump were necessary. Time, 9½ seconds. Two men were put on each end of the carriage; these four easily traversed it. Then 2 men pushing at the end of the loading platform traversed it with difficulty. The gun was then elevated from 5° depression to 20° elevation, 2 men on each elevating wheel (4 men on muzzle). The noncommissioned officer on small loading platform on gun. Time, 1 minute 15 seconds.

The gun was depressed from 20° elevation to 5° depression; noncommissioned officer off platform, other men same as before. Time, 1 minute 56 seconds. The pump was rigged to pump air, ten men pumping in reliefs of 2 up to 130 pounds; from 130 to 150 pounds in reliefs of four, one-half minute shifts. When there is no air pressure in cylinder the gauge reads 5 pounds. The gauge on pump shows pressure as follows; pumping began at 10:28 a. m.:

	H.	M.	S.
35 pounds, at	*10	32	50
40 pounds, at	*10	34	00
45 pounds, at	*10	35	00
50 pounds, at	*10	36	00
55 pounds, at	*10	37	00
60 pounds, at	10	38	00
65 pounds, at	†10	39	00
70 pounds, at	10	40	00
75 pounds, at	10	41	00
80 pounds, at	10	42	20
85 pounds, at	‡10	43	22
90 pounds, at	10	44	20
95 pounds, at	10	45	30
100 pounds, at	§10	46	30
105 pounds, at	10	47	35
110 pounds, at	‖10	48	30
115 pounds, at	10	49	30
120 pounds, at	10+51	00	
125 pounds, at	10+52	00	
130 pounds, at	10+53	00	
135 pounds, at	10	54	30
140 pounds, at	10	55	30
145 pounds, at	10	56	38
150 pounds, at	10	57	48
Total time		29	48

The detachment same in number as on the 9th,—the gun in loading position; time to load, 1 minute 43 seconds, one-half charge (125 pounds) used. The gun was then raised to firing position, 5 men on each side of raising handles; time, 2 minutes 7 seconds; air pressure at start, 134 pounds; at firing position, 47½ pounds.

The gun was fired at 10° elevation.

On firing, the by-pass valve and the cocks to cylinder head were shut. Shortly after the shot struck the water these two cocks were open, and the gauge read 77½ pounds.

The cylinders before firing were filled to the proper height with oil, about 4 gallons being added; recoil, 4 feet ⅛ inch; counter recoil, 2¾ inches. The gun was again loaded with half charge (125 pounds) a gin being used to load shot, and fired at 10° elevation. Pressure was reduced to 35 pounds by gauge. It was 64 pounds after firing; recoil, 5 feet ⅜ inch; counter recoil, 2 inches. The gun was again loaded with half charge (125 pounds), a gin being used to load shot, and fired at 10° elevation; air pressure before firing, 25 pounds by gauge; after firing, 54 pounds; recoil, 5 feet 7⅛ inches; counter recoil, 1½ inches.

The pressure was 54 pounds and left over night. The pressure the next morning was 49 pounds.

Aug. 15, 1893—Before this fire the pump was moved, mounted on skids laid across the recoil cylinder just in rear of air cylinder. The connection was changed so that the pump would pump air over the check valves in the air cylinder. The gun was fired at 9:45 a. m. with half charge (125 pounds); pressure before firing, 20 pounds; after firing, 60 pounds; recoil, 6 feet; counter recoil, ⅜ inch. The pressure was pumped to 150 pounds; no time taken; 10 men, working in reliefs of 2, 15-second shifts, pumped from 150 to 180 pounds.

Pumping began at 10:26:30 a. m.

	Pounds.		Pounds.
At 10:27:30, pressure	155	At 10:31, pressure	170
At 10:28:30, pressure	160	At 10:32, pressure	175
At 10:30, pressure	165	At 10:33, pressure	180

Total time, 6:30 minutes.

The pressure was 180 pounds and left so over night. Aug. 16, at 9:30 a. m., the piston rod had moved 3 inches to the rear. The air pressure read 159 pounds. The pressure was pumped back to 182 pounds; no time taken.

§ 158 half strokes per minute.
‖ 148 half strokes per minute.

Record of firing with 10-inch B. L. rifle (steel), No. 1, Watervliet Arsenal, at

[Object of firing, test of Gor

Date.	No. of fire on carriage.	No. of fire.	Powder.		Projectile.		Travel of shot in bore.	Elevation.	Pressure per square inch of bore.	Recoil.	Counter recoil.
			Kind.	Weight.	Kind.	Weight.					
1893.				*Pounds.*		*Pounds.*	*Inches.*	° ′	*Pounds.*	*Ft. In.*	*Ft. In.*
Aug. 16	21	198	Lot 9; density, 1.850.	250	Cored shot. Lot 324.	569 6 sand. 575	254.25	9 30	Over 60,000..	6 7½	4 ⅞
Aug. 16	22	199	Lot 9; density, 1.850.	225	Cored shot. Lot 324.	570 5 sand. 575	254.25	.....	V, 57,100 X, 59,900	6 9	3 ⅛
Sept. 12	23	200	Du Pont's brown prismatic V. U. Lot 7; density, 1.835.	250	Cored shot. Lot 324.	570 5 sand. 575	254.25	20 00	D, 39,600 M, 37,009	6 9½	1 ⅜

Sandy Hook, from December 21, 1892, to September 13, 1893—Continued.

don disappearing carriage.]

Special remarks about each fire, such as effect on piece, action of breech mechanism, consumption of powder, sound of projectile in night, scattering of fragments, etc., and meteorological data.

Time from 182 pounds to 250:

	Pounds.		Pounds.
At 9:38:15, pressure	182	At 9:45, pressure	220
At 9:39:30, pressure	190	At 9:47, pressure	230
At 9:41:15, pressure	200	At 9:48:45, pressure	240
At 9:43:15, pressure	210	At 9:50:30, pressure	250

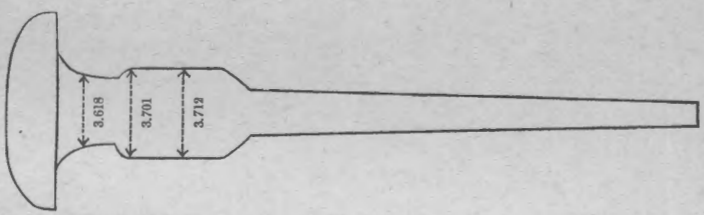
12:15 minutes for 68 pounds.

Ten men working in five reliefs of two at a time for 15 seconds each; strokes vary from about 100 to 160 half strokes per minute.

The gun was then loaded with full charge (250 pounds) and raised in 1 minute 52 seconds, this from the position the gun was in at 9:30 a. m. to the firing position. Air pressure started at 250 pounds, and was at 102 pounds when gun was in firing position; air let off and pressure reduced to 90 pounds by gauge; after firing, pressure 245 pounds. Recoil, 6 feet 7½ inches. Counter recoil, 4⅞ inches. Steadying link on left side broken off. Pump moved 4½ inches to rear by jar from discharge; shot truck and shot fell off rails on loading platform. Pressure over 60,000 pounds.

The pump was moved back to its original position and fastened to beams of platform by 4 lag screws. The beams of platforms were lashed to cylinders.

The gun was again loaded with 225 pounds of powder, and fired at 0°; air pressure before firing, 70 pounds; after firing, 210 pounds. Pressure, about 58,000 pounds. The spindle was broken off at first thread, the two locking nuts and antifriction rings blown to the rear, and fell about 15 feet in rear of carriage.



Air pressure before firing, 90 pounds.
Air pressure after firing, 215 pounds.
Time of flight, 30¾ seconds.

Record of firing with 10-inch B. L. rifle (steel), No. 1, Watervliet Arsenal, at

[Object of firing. Test of Gordon

Date.	No of fire on carriage.	No. of fire.	Powder.		Projectile.		Travel of shot in bore.	Elevation.	Pressure per square inch of bore.	Recoil.	Counter recoil.
			Kind.	Weight.	Kind.	Weight.					
1893.				*Pounds.*		*Pounds.*	*Inches.*	° ″	*Pounds.*	*Ft. In.*	*Ft. In.*
Sept. 13	24	201	Du Pont's brown prismatic V. U. Lot 7; density, 1.835. Lot 2; density, 1.840.	250	Cored shot. Lot 324; weighted up with sand.	575	.....	4 00	{ V, 47, 200 D, 46, 200 }	6 6¼	2¼
Sept. 13	25	202		250		575	.....	4 00	.....	6 6¼	1¼
Sept. 13	26	203		250		575	.....	4 00	{ D, 43, 000 M, 35, 000 }	6 5½	1⅜
Sept. 13	27	204		250		575	.....	4 00	.....	6 6	1⅜
Sept. 13	28	205		245		575	.....	4 00	.....	6 5	2
Sept. 13	29	206		245		575	.....	4 00	.....	6 4	1½

Sandy Hook, from December 21, 1892, to September 13, 1893—Continued.

disappearing carriage for rapidity.]

Barometer, 30, 43; thermometer, 71; humidity, 72.
Times consumed in firing 10 rounds, one noncommissioned officer and 15 men being employed. The detachment was in the loading position, the breech block open, but loading tray in firing position.

	Hour.	Minutes.	Seconds.	Actual time for various operations.	
				Min.	*Sec.*
First round.					
Started to load at	9	49	15	.....	.....
Shot rammed at	9	49	45	.....	30
Powder in	9	52	.....	2	15
Gun at firing position	9	53	40	1	40
Gun ready to fire	9	55	5	1	25
(Time was taken at 9° 55′ 5″ to enable ships to get out of the field of fire, 1 minute from 9° 55′ 5″ to 9° 56′ 5″.)					
Gun fired at	9	56	5	.....	.....
Time consumed in firing first round	.....	5	50	.....	.....
Second round.					
Started to load at	10	25	25	.....	.....
Gun in firing position and time taken	10	29	.....	3	35
(Could not fire on account of ships in the way.)					
Gun fired at	10	47	3	.....	.....
Detachment in position to load	10	47	43	.....	40
Time consumed in firing second round	.....	4	15	.....	.....
(Flange on end of pinion shaft on left side broken and pinion had to be engaged each time by using hand spike for remaining rounds.)					
Third round.					
Started to load at	11	2	42	.....	.....
Gun ready to fire at	11	9	3	6	21
(Time taken at 11° 9′ 3″ to enable ships to get out of the field of fire.)					
Gun fired at	11	14	30	.....	.....
Time consumed in firing third round	.....	6	21	.....	.....
Fourth round.					
Third round fired at	11	14	30	.....	.....
Detachment in loading position for fourth round	11	16	58	2	28
(Time taken at 11° 16′ 58″ to enable pressure plugs to be removed.)					
Resumed loading	11	33	12	.....	.....
Gun in firing position	11	36	7	2	55
Ready at	11	36	48	.....	41
(Time taken at 11° 36′ 48″ to enable ships to get out of line of fire.)					
Gun fired at	11	44	23	.....	.....
Time consumed in firing fourth round	.....	6	4	.....	.....
Fifth round.					
Fourth round fired at	11	44	23	.....	.....
Detachment in loading position for fifth round	11	45	17	.....	54
Gun in firing position	11	48	42	3	25
Gun fired at	11	48	53	.....	11
Time consumed in firing fifth round	.....	4	30	.....	.....
Sixth round.					
Fifth round fired at	11	48	53	.....	.....
Detachment in loading position for sixth round	11	49	33	.....	40
Gun in firing position	11	54	20	4	47
Gun fired at	11	54	30	.....	10
Time consumed in firing sixth round	.....	5	37	.....	.....

Record of firing with 10-inch B. L. rifle (steel), No. 1, Watervliet Arsenal, at

Date.	No. of fire on carriage.	No. of fire.	Powder. Kind.	Powder. Weight.	Projectile. Kind.	Projectile. Weight.	Travel of shot in bore.	Elevation.	Pressure, pounds per square inch of bore.	Recoil.	Counter recoil.
1893.				*Pounds.*		*Pounds.*		*Inches.*	*Pounds.*	*Ft. In.*	*Ft. In.*
Sept. 13	30	207	Du Pont's brown prismatic V. U. Lot 2; density, 1.849.	240		575	.....	4 00	.....	6 2½	1⅜
Sept. 13	31	208		240		575	.....	4 00	.....	6 2½	1
Sept. 13	32	209		240		575	.....	4 00	.....	6 2½	⅝
Sept. 13	33	210		240		575	.....	4 00	.....	6 2½	1

Sandy Hook, from December 21, 1892, to September 13, 1893—Continued.

Special remarks about each fire, action of breech mechanism, consumption of powder, sound of projectile in flight, scattering of fragments, etc., and meteorological data.

	Hours.	Minutes.	Seconds.
Seventh round.			
Sixth round fired at	11	54	30
Projectile rammed	11	56	2
Powder in	11	56	40
Block closed	11	57	10
Primer in	11	57	23
Gun in firing position	11	58	52
Fired at	11	59	13
Time consumed in firing seventh round	.....	4	43
Eighth round.			
Seventh round fired at	11	59	13
Breech block open	12	0	2
Shot in	12	0	42
Powder in	12	1	22
Block closed	12	1	41
Primer in	12	1	52
Ready for firing	12	6	40
Fired at	12	7	01
Time consumed in firing eighth round	.....	7	48
Ninth round.			
Eighth round fired at	12	7	01
Breech block opened	12	8	17
Shot in	12	8	30
Powder in	12	9	8
Block closed	12	9	20
Primer in	12	9	29
Gun in firing position	12	14	19
Fired at	12	14	30
Time consumed in firing ninth round	.....	7	29
Tenth round.			
Ninth round fired at	12	14	30
Breech block open	12	15	17
Shot in	12	15	51
Powder in	12	16	29
Block closed	12	16	52
Primer in	12	17	03
Gun in firing position	12	20	21
Time consumed in firing tenth round	.....	5	51
Actual time consumed in firing ten rounds	.....	58	28

Air pressure before firing, 80 pounds. Before this firing a new mushroom head was fitted to breech block, which was taken from 10-inch B. L. R. No. 6. After firing the front band on gun holding elevating arc had moved forward $\frac{3}{8}$ inch. The left front pin bearing of the counterweight has moved up out of its seat $\frac{5}{16}$ inch. Rear hand rail collar on gun moved to the front $\frac{1}{4}$ inch.

Firing conducted by Lieut. E. St. J. Greble, Second Artillery, U. S. A., in the presence of the Ordnance Board. Present: Maj. C. Comly, Ordnance Department; Capt. F. Heath, Ordnance Department; Capt. W. Crozier, Ordnance Department.

APPENDIX C.

ABSTRACT OF REPORTS ON TRIALS WITH SIMS-EDISON 2-MILE TORPEDO.*

* The detailed reports with blue prints, upon which the above abstract is based, are not published as the results obtained are fully given in the abstract.

[Contract entered into March 4, 1891.]

COST.

Torpedo proper, complete	$12,500
One engine, 80 horse power	1,295
One steel boiler, 75 horse power	3,770
Two multipolar marine dynamos, at $3,830 each	7,660
Total	25,225

	Date of trial.	Nature of trial.	Results.
	1891		
1	Aug. 6	Speed trial (chart)	Torpedo ran 5,800 feet in 5 minutes and 15 seconds, giving an average speed of 12.5 miles per hour. Speed between stations 9 and 10, and 14 and 15, 19.7 miles per hour.
2	Aug. 11	....do	Torpedo ran 7,400 feet in 6 minutes. Average speed, 14.01 miles per hour. Speed from stations 7 to 11 was 19.88 miles; between 9 and 10 the speed was 23.64. The last speed was evidently due to an error in triangulation. (Remarks: A number of invited guests were present. This run was preceded by a dock trial.)
3	Aug. 17	Speed trial	Failure. This run was intended to be an official test of speed. Torpedo stopped after passing the 500 foot buoy; stuffing box or coupling between cable and motor section burned out.
4	Aug. 19	Steering trial	Torpedo stopped after running only 500 feet. An electric-light wire fouled the main wire. At 1:30 the run was again attempted. Torpedo stopped again at same distance. Coupling between motor and cable burned out.
5	Aug. 25	Steering trial	At 9:30 a run was attempted; when about 1,000 feet from dock the main current crossed to the inner core. It was found that cable was badly worn. The current burned through from the outer to the inner core.
6	Aug. 27	Speed trial (chart)	At 10 a. m. another run was made. Torpedo ran 5,580 feet, 14.78 miles per hour. Speed for 2,100 feet, 18.3 miles per hour.
6	Sept. 1	....do	Another run was attempted, but after running 2,100 feet the coupling again burned out. Maximum speed, 15.6.
6	Sept. 4	Speed trial	Another attempt was made, but the cable burned out after the torpedo ran a few hundred feet. Further trials were suspended until a new cable could be supplied.
7	Oct. 2	Speed trial (plot on report).	Torpedo started from dock and ran for half a minute on a straight course. The steering gear was applied to the left and the speed immediately slackened and torpedo soon stopped.
8	Oct. 9	Motor trial	The trial consisted in running a current from the dynamo through the cable and motor.
9	Nov. 4	Dock trial	The torpedo was run in the water and prevented from moving forward by a stern line. (Remarks: This report was forwarded to the Chief of Engineers with monthly report for November, 1891.)
	1892.		
10	Feb. 10	Speed and steering trial (chart).	Torpedo ran 4,770 feet, stopped between 2 and 3 buoys on account of short circuit in motor. Speed, 16.2 miles per hour. (Remarks: This report was forwarded with monthly report for February, 1892.)
11	July 12	Speed trial (chart)	Torpedo ran 1 mile in 3 minutes and 17 seconds, or 18.27 miles per hour. (Remarks: This report and the four following were forwarded to the Chief of Engineers with special report dated Aug 25, 1892.)

No. of report.	Date of trial.	Nature of trial.	Results.
	1892		
12	July 18	Speed trial (chart)	Torpedo ran 1 mile in 2 minutes and 53 seconds, or 20.8 miles per hour.
13	July 20	Trial to dive under spar.	After passing the starting buoy the torpedo dove and buried its point in the mud. Another attempt was made, with same result.
13	July 22	Trial to dive under spar (plot on chart).	At 10 a. m. the torpedo started well, but exhibited no tendency to dive. It was found that the coupling between the cable and the torpedo burned out. At 2 p. m. before starting Mr. Sims discovered the relay coils had burned out in the a. m. trial. No run was had.
14	Aug. 12	Trial to dive under spar (chart).	Torpedo refused to obey the rudder and could not be brought back to the spar on the return. Speed 11.09 miles per hour.
15	Aug. 17	.....do	Torpedo struck spar and disappeared. Speed during the 1 minute run 14.1 miles per hour. Speed at time of striking not over 15 miles per hour. Torpedo was found about 300 feet from spar in the mud. Float damaged and filled with water. Spar 35 feet long anchored 1,200 feet from dock.
16	Nov. 14	.....do	Torpedo passed under spar, striking it about one-third the length from the smaller end. No damage to torpedo. Speed 15.4 miles per hour. Torpedo continued on its course.
16	Nov. 15	.....do	Torpedo missed spar completely. Average speed over course 18.9 miles per hour.
17	Nov. 22	.....do	Torpedo started and steered well until it nearly reached the spar, when the steering mechanism failed to work, and the torpedo passed the spar to the right. Speed 18.6 miles per hour. Repeated attempts failed to work the steering mechanism.
17	Dec. 1	Dock trial.....	Testing the circuit for leaks.
17	Dec. 2	.....do	Do.
17	Dec. 2	Trial to dive under spar (same chart).	Torpedo struck spar and snapped it in two. Continued on its course apparently uninjured. Speed at striking somewhat over 18 miles per hour.

W. R. KING,
Lieutenant-Colonel of Engineers.

U. S. ENGINEER OFFICE,
Willets Point, New York Harbor, December 23, 1892.

UNITED STATES ENGINEER OFFICE,
Willets Point, Queens County, N. Y., April 21, 1893.

GENERAL: Referring to my report of December 23, 1892, on the performance of the Sims-Edison torpedo, I have the honor to submit the following additional report and to request instructions as to what further trials, if any, are desired before accepting the balance of the outfit.

The float has been stuffed with cotton and the ballast in the forward compartment has been increased to about 450 pounds. This latter is the weight given by Mr. Sims, but it is proposed to verify it when the ballast is taken out, which will be done as soon as it has been decided whether any further runs are necessary.

The first run was intended to make the speed and diving tests at the same time. A spar 51 feet long, 14 by 14 inches at one end and 11 by 11 inches at the other, averaging (the corners being chamfered) about 12 by 12 inches, was moored across the course and three bouys were planted to mark the starting point, half mile and mile limit, or, exactly, 5,315 feet, which was as near as the bouys could be planted without unnecessary delay. It will be noticed that the spar was much heavier than any that have been used before, and as the torpedo had already been in contact with several spars the test was a severe one, and I had no idea that the torpedo would reappear after it went under. It did, however, come up in good shape and continue its course for nearly a

mile beyond the spar, during which time it remained under control of the operator and made a speed of 15.6 miles per hour. On examining the torpedo after it was removed from the water the only apparent damage was a slight bend in the forward brace, which would hardly be detected without special attention was directed to it.

Unfortunately, the speed on impact was hardly up to the contract figure, and it was proposed to try it over again, but in view of what the torpedo had already undergone in previous diving experiments, I thought best to defer any further trials in that respect, at least until the speed trial had been satisfactorily completed.

This was done on the 17th instant, when the torpedo made a run over the same course in one hundred and eighty-three seconds, or at the rate of 19.93 miles per hour, nearly 2 miles more than the contract calls for. During this run, as in fact during the last three runs, excepting when diving under the spar, the torpedo ran on an even keel and responded to the steering lever, and there was no burn in the cable or any other part of the line or instruments. The endurance of the cable has been such as to show that it must have been thoroughly and carefully made. It must have been reeled and paid out some twenty times and sometimes severely strained by getting foul of obstructions in the channel, but the greater portion of it is still apparently in fair condition.

No special runs have been made to test the steering mechanism, but at the end of each of the speed runs the torpedo was brought around to right or left and the course plotted. In some places the radius of curvature is about 300 feet, but the average is considerably more, and shows that the throw of the rudder should have been increased, which is a matter of adjustment within certain limits. There is no difficulty in giving the rudder a sufficient throw, but of course it requires more power to move it as the space between the armature and poles of the steering magnets increases. This question, however, was pretty thoroughly tested last year, and I have no doubt that the torpedo can be made to steer within a radius of 300 feet.

The detailed reports of the last three runs, giving the electrical data and plots of the course, by Lieut. McGregor, are inclosed herewith.

Very respectfully, your obedient servant,

W. R. KING,
Lieutenant-Colonel of Engineers.

Brig. Gen. THOMAS L. CASEY,
Chief of Engineers, U. S. A., Washington, D. C.

APPENDIX D.

GOVERNOR'S ISLAND, NEW YORK HARBOR,
July 11, 1893.

GENERAL: The committee of the board, directed to examine and report upon the 12-centimeter quick-fire gun and mount of Schneider & Co., Creusot, France, have the honor to submit the folowing relative thereto:

The representatives of the company, having stated that the material was ready for inspection, your committee proceeded to Chicago and carefully examined the same on July 3 and subsequent days of that week.

This gun is of forged and tempered steel, 50 calibers in length, and weighs 7,187 pounds. It has a tube extending throughout its whole length; the breech block, which is of the slotted-screw French fermature type, has its bearing directly in this tube; shrunk upon the latter, carrying a shoulder near its rear end, so as to take up the longitudinal strain, is a jacket, extending over about 7.5 feet of the tube. The longitudinal strain is transmitted by this to two saddle hoops, without trunnions, and by them to the carriage slide or cradle.

Finally, there is a system of hoops for additional tangential strength.

The gun is adapted to the use of metallic ammunition, and fires a cartridge of 8.25 kilograms (18.19 pounds) of BN smokeless powder, with a projectile weighing 22 kilograms (48.5 pounds).

With this charge an initial velocity of 810 meters (2,657 foot seconds) is obtained with a pressure of about 2,800 kilograms per square centimeter (39,825 pounds per square inch).

The breech plug is slotted on three sectors, which is claimed as an advantage over such as are slotted on four, on account of the slight increase in bearing surface, due to the loss at the ends of the threads at each slotting. The block, when withdrawn, rests in a tray, hinged on the left side. Mounted in this tray is a double latch, similar to that found on service guns of the French marine, serving to lock the block in the tray when the breech is open or to the gun when closed.

The block is manipulated by means of an ordinary handle on the left and a lever handle on the right of the rear face, which lever has a spring safety catch on its front side.

In the bottom smooth sector of the screw box is a heavy extractor bar, bearing at its front end an upturned arc, whose cord is 3 inches, on a diameter about 5.85 inches. On the left side of this extractor bar is a gear rack.

On the hinge pin, at its lower end, is a gear sector, which engages in this rack. In its surface is a seat for a catch, mounted vertically in the tray. This catch is kept, by a spring, in contact with an inclined surface on the lower hinge ear.

The breech being closed, with the extractor in, bearing against the front side of the rim of the shell to withdraw the block, seize the lever handle in the right hand, compressing the spring catch, which

branches from its front side, thus releasing the block lock. Turn the block through one-sixth of a turn and draw it to the rear and swing it to the left. The block is supported by the tray-guide ribs, and at the end of its rear movement strikes on the ends of these surfaces. The shock disengages the double-tray latch from the breech of the gun and catches it in the block. At the same time the spring catch engages in its seat in the extractor-gear sector.

This seat is slightly elongated, so that some motion in rotation about the hinge pin may be had before the extractor bears. Swinging the block quickly causes the extractor to be so engaged as to give a blow to start the shell.

The revolution being continued, the gear sector carries the extractor bar and the shell to the rear; at the same time the inclined surface on the hinge car gradually lifts the sector bolt from its seat, releasing it just before the end of the motion of rotation of the block.

The extractor bar is thus left free, so that in the insertion of the next cartridge it can be slid to the front by the rim of the shell.

To insure the block not being opened before the gun is fired, there is mounted in the rear face of the gun, opposite and above the position of the lever handle, with the breech closed, a spring bolt, which opposes all movement of the handle. It carries on its left side a spring spur. When the gun is fired this bolt compresses the spring, and the spur engages in a seat in the gun and the lever handle is released. If there be a miss fire the bolt is not disengaged, and the block can not be opened until the spring is compressed by hand.

Mechanism is provided for electric or percussion firing; each has a safety latch, so that the gun can not be fired until the breech is entirely closed.

In the percussion form there is mounted in the center of the block a heavy firing pin, with a spiral mainspring about the greater portion of its length, its points being so retracted as to stand flush within the front face of the block by a lighter spring about the point section. At the rear end of the firing pin is the sear notch, in which catches the spring sear, mounted in a lever, pivoted in the lever handle. The axis of the lever is capable of a movement of rotation by a T-shaped head, which engages in a key groove in the rear face of the gun. This key is controlled by another lever, to which is attached the lanyard.

Pulling on the lanyard cocks the firing pin; still further pulling it releases the sear.

By the combination of the sear in the lever handle and the key groove, in the face of the breech, the firing pin is not cocked till the breech is entirely closed.

When the electric fuze is desired the percussion firing pin is replaced by one in a hard-rubber tube, its point being caused to project slightly beyond the front face of the block by a spring. The sear and trigger are replaced by an insulated conductor, having a spring at the end. When the breech is closed the point of the firing pin is in contact with the primer, in the center of the cartridge head.

Electrical contact is established by a post, screwed to the face of the breech, against which the lever abuts with its connection with the firing pin, when the block is entirely closed. One wire from the battery is fixed in this post. The other is attached to the carriage. The gun is fired by a circuit closer. All of the contact points are of silver.

The special claims made for the breech mechanism are—

(1) That the parts are all heavy and strong and little liable to injury.

(2) That the extractor is positive in its action—is not of the spring form—hence will not release the head and spring off; it extracts the shell without forcibly ejecting it, which latter renders it liable to injury. It is such that the projectile can be pushed to its seat, thus reducing escape of gas over the band and consequent erosion. The breech can, if necessary, be opened and the shell left in the gun.

The shell is said to be of the same exterior as the Hotchkiss shell. It is made in two pieces. The body is of ordinary brass, whilst the head is of aluminum bronze. The union is by a fine screw thread, the lap being such as to insure a perfect gas check. It is capable of three rounds without resizing.

The powder used is the BN smokeless with a priming of black powder. The projectile is seated up to the rotating band, which gives constant density of loading. The projectiles are of three forms—cast iron, armor piercing of chrome steel, and shrapnel.

The carriage upon which the gun is mounted is of the central pivot nondisappearing type, with two hydraulic recoil cylinders and parallel spring-return pistons.

It is composed of the body or cradle, of two check cylinders, a chassis, a bedplate, baseplate, and pintle. It is furnished with a shield, ordinarily of steel; the one at the Exposition is of cast iron.

The weight of the carriage, without the shield, is 2,850 kilograms (6,283 pounds); the shield, 7 centimeters (2.8 inches) thick, weighs 3,950 kilograms (8,708 pounds); total, 6,800 kilograms (14,991 pounds).

The body of the carriage is of cast steel, forming a cradle, made in two parts bolted together. This cradle has trunnions resting in the chassis. Each side of the cradle is an inverted U-shaped beam. The front and rear portions have projections therefrom, which serve as supports of the cylinder rods. A middle transom stiffens the construction.

The slides are of forged steel—they have (front and rear) two cylindrical cavities which constitute the check cylinders.

When the gun is fired it carries the check cylinders to the rear, the pistons attached to chassis slide remaining stationary; the liquid which is in front of each of the pistons is forced through grooves varying in cross-section so as to make the resistance constant—the maximum recoil possible being 215 mm.

During the recoil the vacuum which tends to form in the front cylinder by the withdrawal of its piston-rod is filled by the second piston-rod which enters this cylinder.

The check is thus kept at a constant volume.

It is claimed that this system of twin hydraulic cylinders, composed of four cylinders, the piston-rods of two of which are under compression and two under extension, so divides the effects of recoil as to reduce the shock and wear on the parts to a minimum.

The return into battery is obtained by recoil springs mounted on rods parallel to the recoil cylinders and below them. The tension of the springs is capable of adjustment by means of nuts on the threaded rods.

The sides of the chassis take the weight of the cradle, slides, check cylinders, and gun, and transmit it to the circular bed-plate to which they are bolted. In the center of the latter is a cavity which takes the pivot of the bottom plate, and upon its circumference is a roller path for twenty-four conical live rollers, which in turn bear upon a lower roller path upon the bottom plate—these rollers have their trunnions bearing in two separating circles regulating their dispersion and radial distances. This roller circle is protected by a clamp circle embracing the lower plate.

The pointing between 5° depression and 20° elevation is obtained by a hand wheel on the end of a worm shaft engaging in a pinion which takes in a rack on the side of the cradle.

All the pointing apparatus is upon parts which do not recoil, hence the gunner executing the pointing need not abandon the wheel during firing.

The pointing in azimuth for all-round fire is accomplished by means of a hand wheel actuating a worm shaft which takes in a vertical pinion, which engages in the circular rack on the base-plate. It is claimed the gun can be traversed through 360° in two minutes.

The base-plate is secured to the foundation by twenty-four bolts. It carries the pivot which has a bronze bearing ring; also the forged steel gear circle.

The following are the principal data relative to the gun and mount:

	Measurement.	
	French.	English equivalent.
GUN.		
Total length of gun	6 meters	19.69 feet.
In calibers	50	
Weight of gun, including breech mechanism	3,260 kilos	7,187 pounds.
Weight of projectile	22 kilos	48.5 pounds.
Charge of powder, PB	12 kilos	26.5 pounds.
Same, BN	8.25 kilos	18.19 pounds.
Weight of empty shell	9.20 kilos	20.28 pounds.
Total weight of cartridge, armor-piercing shell, BN powder	39.45 kilos	86.97 pounds.
Length of same	1.35 meters	53.15 inches.
Initial velocity with—		
PB powder	715 meters	2,346 foot-seconds.
BN powder	810 meters	2,657 foot-seconds.
Ratio of weight of gun to projectile $\frac{P'}{P}$	148	
Energy of projectile $\frac{pv^2}{2g}$:		
With PB powder	573 ton-meters	1,880 foot-tons.
With BN powder	735 ton-meters	2,411 foot-tons.
Penetration in iron plate with BN powder	305 millimeters	12 inches.
CARRIAGE.		
Weight of carriage without shield	2,850 kilos	6,283 pounds.
Weight of shield, 70 millimeters thick	3,950 kilos	8,708 pounds.
Amplitude of pointing		360°.
Time of total traversing		2 minutes.
Amplitude of pointing elevation		5° depression to 20° elevation.
Time from −5° to +20°		12 seconds.
Height of trunnions above platform	950 millimeters	37.4 inches.
Maximum recoil	215 millimeters	8.5 inches.

In addition to the 12-centimeter quick-fire gun the committee examined a 75-millimeter (2.95 inches) field gun mounted on a steel carriage with exactly similar recoil system. The weight of the gun was 326 kilograms (719 pounds); that of the carriage could not be ascertained.

The flask was of two rolled steel plates flanged on top and bottom edges. A transom about midway constituted one end of an implement box stiffening the carriage. The system was extremely low, being so arranged as to bring the plane of the axes of the recoil cylinders nearly coincident with that of the axis of the axle. The clearance from the ground was but 9 inches to the trail and recoil mechanism; this could be increased to 1 foot by removing the brake wheel. The road brake was a transverse bar with shoes, drawn up to a bearing by a hand wheel acting on a system of levers. The gun was capable of fire between −5° and + 20°. The limber carried 33 cartridges in horizontal

compartments and three small implement trays. The shells were 1.05 meters long.

A 12-centimeter field howitzer weighing 455 kilograms (1,003 pounds) was also examined. It was mounted on a similar recoil cylinder carriage, and while not as low as the field gun, was too low for firing over parapets except for plunging fire. It was capable of elevations between 5° depression and 40° elevation.

The elevating arc was made of about three-quarter inch steel and supported only at one end. The latter apparatus would not stand even ordinary service.

Both guns had the same breech mechanism, differing but slightly from that of the 12-centimeter gun. Data as to weights and dimensions concerning both of the carriages could not be obtained, but were promised to be furnished in the near future.

As a result of the examination of the material exhibited, your committee would recommend that there be purchased the 12-centimeter gun and mount, together with shield, for the sum of $7,600 (40,000 francs), provided there be included working drawings of the gun, breech mechanism, carriage, and cartridge; and it is recommended that it be ascertained if the Hotchkiss shells will fit the chamber, with the view of testing the gun with such cartridges, they being cheaper than those offered to be furnished by the company.

CLIFTON COMLY,
Major Ordnance Department, U. S. Army.

C. C. MORRISON,
Captain Ordnance Department, U. S. Army.

Gen. J. M. SCHOFIELD,
President Board of Ordnance and Fortification.

INDEX.