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Mapping Kansas And Nebraska The Role Of The General Land Office

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MAPPING KANSAS AND NEBRASKA

THE ROLE OF THE GENERAL LAND OFFICE

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The rectangular alignment of fields, farmsteads, and roads is one of the most striking characteristics of the settlement pattern of the Great Plains. As most students of this region's cultural landscape are aware, the dominant factor in the formation of this regular, geometric pattern was the federal government's rectangular survey system. The basic features of this survey system (base lines, principal meridians, 36-square-mile townships, sections, and quarter sections) have been outlined in introductory geography and cartography textbooks, while historical and cultural geographers have examined the system's effect on the landscape.[1] In addition, much has been written about the land alienation process and the development of the General Land Office, the federal agency that administered the newly developed cadastral system.[2] Few writers, however, have specifically addressed the mapping activities that were an integral part of the land survey and disposal system.[3]

This article examines the mapping activities of the General Land Office in Kansas and Nebraska. By focusing on these two states, it is possible to identify the personnel and procedures involved in the cartographic process, the geographical and temporal progress of the mapping program, and the resulting manuscript and published cartographic records. The General Land Office's role in Kansas and Nebraska does not represent a unique situation in the agency's mapping activities, but it does provide an example of the General Land Office's role in mapping the Great Plains.

Previous cartographic portrayals of this region were limited to the basic elements of the landscape documenting the experiences of early explorers and military expeditions.[4] On the other hand, the General Land Office's mapping activities represent a new phase in the cartographic representation of the Great Plains, because those activities resulted in the first comprehensive topographic mapping of the area.

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THE CARTOGRAPHIC PROCESS IN KANSAS AND NEBRASKA

By the time the General Land Office surveys reached the Great Plains, a fairly well-defined system of surveying and mapping had been established, complete with its own bureaucracy and standardized procedures. Surveying of the public domain began in Ohio following the passage of the Land Ordinance of 1785 and proceeded westward, paralleling the westward expansion of the settlement frontier. In Kansas and Nebraska, General Land Office activities commenced in 1854 after the Kansas–Nebraska Act established the two territories. Both territories were combined under one surveyor general until 1867. Thereafter, they were separate offices until the Kansas surveys were completed in 1876 and the Nebraska surveys in 1895.

Surveying activities in Kansas and Nebraska, as well as in other public land states, were directed by a surveyor general, who reported directly to the commissioner of the General Land Office in Washington, D.C. During the period when Kansas and Nebraska were combined under one office, there were five surveyors general, each of whom served an average term of three years. The surveyors for Kansas and Nebraska were John Calhoun (August 1854–July 1858), Ward B. Burnett (July 1858–April 1861), Mark W. Delahay (April 1858–October 1863), Daniel W. Wilder (October 1863–March 1865), and Hiram S. Sleeper (March 1865–July 1867). Sleeper continued in the Kansas office until April 1869, when he was replaced by Carmi W. Babcock, who served until the office was closed in 1876. All were political appointees, and only Calhoun and Sleeper had any previous surveying experience.[5]

The surveyor general had a small staff consisting of a chief clerk, a principal draftsman, assistant draftsmen, copyists, clerks, accountants, and messengers. The chief clerk occupied the highest paid position, serving as the surveyor general's assistant and supervising the other employees in the surveyor general's absence. The other employees assisted in the review and transcription of field notes, the compilation and copying of plats, and the preparation and copying of contracts and bonds. The tenure of the permanent staff was relatively short, although there was some upward mobility within the office. For example, during the first ten years of the Kansas–Nebraska office, there were eleven chief clerks, none serving for more than two years but averaging terms of eleven months each. Of the eleven, four had previously held the position of principal draftsman.[6]

There was no permanent official surveying staff. The actual surveys were completed by deputy surveyors who worked under contract to the surveyor general. Each deputy surveyor was responsible for hiring his own surveying party, which consisted of the surveyors themselves as well as chainmen, flagmen, and axemen. Payment to the deputy surveyors was based on a mileage rate: twelve dollars for standard lines, seven dollars for township exterior lines, and five dollars for section lines. Although some deputy surveyors attempted to abuse the system, examiners were hired to check the quality of the surveys.[7]

Considering the short tenure of office employees and the contract nature of surveying, there is a remarkable consistency in the physical appearance of the cartographic records. Given the number of deputy surveyors involved, a degree of subjectivity and selectivity in the recording of the data was inevitable. However, the uniformity that existed in the surveying and mapping activities was provided by a manual of surveying instructions first published in 1855.[8] The instructions prescribed the method of surveying, the type of information to be recorded in the field notes, and the procedure for preparing plats.

The system of surveying prescribed was hierarchical, starting with the establishment of a base line and principal meridian as depicted in diagram A of the manual (fig. 1). The next level involved establishing a series of guide meridians (every eight ranges) and standard parallels or correction lines (every four tiers north of the base line and every five tiers south

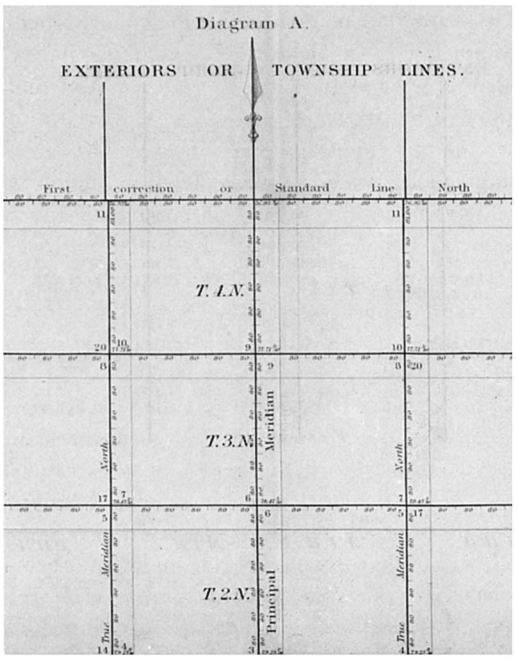

FIG. 1. *Diagram, "Exteriors or Township Lines," illustrating the grid of base line, meridians, and correction lines, which provides the basic framework for township surveys.* U.S. General Land Office, *Instructions to the Surveyors General,* 1855.

of the base line). The crossing of the guide meridians and parallels created a grid framework from which the exterior boundaries of a block of townships could be surveyed, after which the individual townships would be subdivided into sections. Surveying began in the southeast corner of each township between sections 35 and 36 and progressed in a standard fashion to the northwest corner, ending between sections 5 and 6. Any deficiencies from the standard section size of 640 acres were adjusted to exterior lots of varying sizes in the northern and westernmost half-miles of the township.

Other instructions established the mechanics of surveying, such as the specific instruments to be used, the proper procedure for chaining or measuring, and the type of mound or monument to be erected. An ordinary compass and a two-pole chain (thirty-three feet long) or a four-pole chain (sixty-six feet) were to be used for surveying township and subdivision lines. The four-pole chain could be used on level ground, but the two-pole chain was to be used on more uneven surfaces. Procedures for tallying (counting the chains) and leveling were also specified. A Burt's improved solar compass was to be used when variations in the compass were found.[9] Detailed instructions were also provided for the erection of stones and mounds for township, section, and quarter section corners.

Instructions for field notes were also very specific. The surveyors were warned:

> [The notes] must be a faithful, distinct and minute record of everything officially done and observed by the surveyor and his assistants, pursuant to instructions, in relation to running, measuring, and marking lines, establishing boundary corners etc., and present, as far as possible, a full and complete topographical description of the country surveyed, as to every matter of useful information, or likely to gratify public curiosity.[10]

Specifically, the surveyors were requested to record the precise length of every line run, the kind and diameter of all "bearing trees," the kind of materials from which mounds were constructed, trees on line, intersections of the line with land and water objects (settlers' claims, improvements, prairies, rivers, creeks, bottoms), land surface (level, rolling, or broken), soil (first, second, or third rate), timber, coal deposits and other minerals, roads and trails, compass variation, and a general description of the township as a whole.[11]

The field notes were to be returned to the surveyor general's office, where a transcript would be prepared for transmittal to the General Land Office in Washington, D.C. In addition, three plats would be drawn according to a prescribed style. One copy was retained by the surveyor general, one copy was forwarded to the General Land Office in Washington, and the third copy was sent to a local land office.[12]

PROGRESS OF SURVEYS IN KANSAS AND NEBRASKA

The progress of surveys in Kansas and Nebraska from 1854 to 1895 can be traced in the annual reports of the surveyor general to the commissioner of the General Land Office.[13] Although the comments and types of statistics recorded from year to year were not consistent, it is possible to summarize the general progress of these surveys.

After opening a temporary office at Fort Leavenworth in October 1854, the surveyor general's first project was the surveying of the base line, which would also serve as the boundary between the two territories.[14] This initial contract was granted to John P. Johnson. He started at the point where 40° north latitude crosses the Missouri River and extended the base line westward 108 miles to the proposed intersection with the principal meridian. The examiner found that his surveys were so defective that they had to be resurveyed.[15] The second attempt was completed by the examiner, Charles A. Manners, but he surveyed only sixty miles of the base line to the proposed intersection with the first guide meridian. Additional surveys during the first year included the demarcation of the first guide meridian and standard correction lines from four north to four south. In addition, more than 200 townships were in the process of being surveyed but were not completed when the 1855 annual report was submitted.

During 1856 the base line was extended westward to the intersection with the principal meridian, and the principal meridian and standard parallels from the northern boundary of Nebraska to the fifth standard parallel south were surveyed. Subdivided townships included most of the area in the northern two-thirds of Kansas, east of range 13, and the southern two-thirds of Nebraska, east of the first guide meridian. The surveys in this area were complicated by the presence of Indian reserves and trust lands. In Nebraska the surveys excluded the Omaha and Oto reserves, while in Kansas the surveys excluded the Kickapoo, Potawatomi, Delaware, Kansa, Sauk and Fox, and Ottawa reserves as well as the Osage, Cherokee, and New York Indian lands in the southern one-third of the state.

The geographic progress of township surveying and mapping is summarized in figure 2, which shows the extent of completed townships at five-year intervals, beginning with the status as reported in the 1856 annual report.[16] By the beginning of the Civil War, all the townships east of the principal meridian and north of township 23 south had been surveyed. In addition, the surveys extended westward along the base line to the first guide meridian west and northwest to Fort Kearney in Nebraska. During the Civil War, surveying activity was greatly reduced, extending westward only along the base line to the third guide meridian west.

During the first five-year period after the Civil War, major expansion occurred. In Kansas the surveys in the southern one-third of the state corresponded to the opening of the Osage Indian lands, while the westward expansion between the first and third standard parallels took place in response to the location of the Butterfield Overland Trail and the Kansas Pacific Railroad. In Nebraska the surveys extended westward along the base line and between the second and fourth standard parallels, following the route of the Union Pacific Railroad. By 1876 the remainder of Kansas was surveyed,

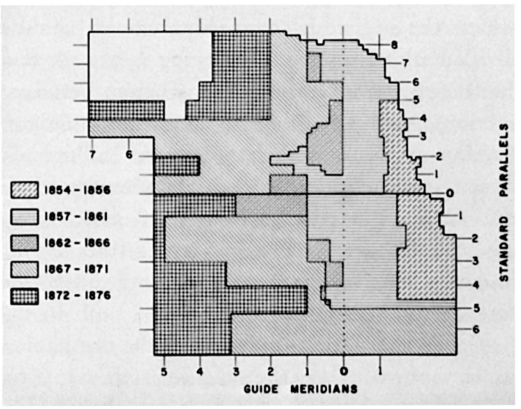

FIG. 2. *Progress of Township Surveys, Kansas and Nebraska, 1854–1876.*

while the surveys in Nebraska extended to the north and west, leaving only the northwest quarter of the state unsurveyed. This area was finally completed in 1895.

The total acreage subdivided into townships in each state on a yearly basis is depicted in figure 3.[17] It clearly shows that the surveys were not conducted at uniform rates. In general, the surveys in Nebraska progressed at a slower rate than did those in Kansas. In the early years, the difference was attributed to the desire to survey the Indian trust lands so that they could be sold quickly. Until 1859 the surveys progressed rapidly, with at least two million acres surveyed each year in each territory. From 1860 to 1866, progress was greatly retarded. In each territory the yearly average was less than one million acres. After the Civil War, there was a dramatic increase in the quantity of land surveyed, corresponding to the interest in the construction of the transcontinental railroads and anticipated settlement on railroad lands. In Kansas surveying activity peaked in 1871 with 7.1 million acres. In Nebraska it peaked in 1873 with 4.4 million acres.

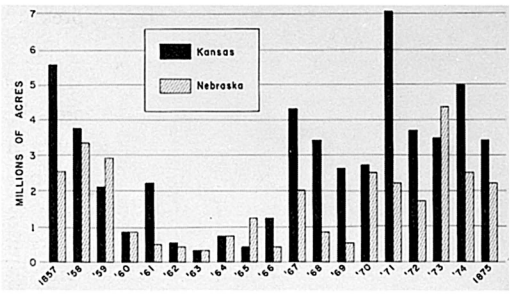

FIG. 3. *Number of Acres Surveyed, Kansas and Nebraska, 1857–1875.*

MANUSCRIPT SURVEY RECORDS

The primary cartographic records that resulted from this surveying activity were manuscript plats and field notes. Although separate plats were prepared as the base line, meridians, correction parallels, and exterior township lines were surveyed (figs. 4 and 5), the basic records were the three township plats: an original, which was retained by the surveyor general; a duplicate, which was sent to the commissioner of the General Land Office (fig. 6); and a triplicate, which was sent to the local land office (fig. 7).[18] These plats were compiled from the original field notes on preprinted forms at a scale of forty chains to an inch, or one inch equals one-half mile.

The creation and contents of the plats can be illustrated by the records for township 25 south, range 3 west, a township in Sedgwick County, on the Arkansas River, approximately twenty miles northwest of Wichita, Kansas. The authority statement in the lower margin of the township plat (fig. 6) indicates that several deputy surveyors were involved in surveying this township and that the process covered the period from October 1858 to March 1861. The southern boundary was surveyed by Frederick Hawn in October 1858, while the remaining exterior township lines were surveyed by James Withrow in September 1860. Isaac C. Stuck and William M. Hill surveyed the section lines from 20 to 24 November 1860. According to standard procedure, the field notes were submitted to the surveyor general, then located in Nebraska City, where the notes were examined and copied, and the plats compiled and copied. On 18 March 1861, the plats were certified by Ward Burnett, the surveyor general.

The surveys of the exterior boundaries, which were performed under two separate contracts, were recorded on two different plats. The plat for the fifth standard parallel (fig. 4), which includes the southern boundary of the township, illustrates that these plats showed a minimum of information, concentrating on the surveyed line and only those physical or cultural features that were crossed in the survey. The remaining exterior boundaries of the townships were surveyed with a block of forty townships, bounded by the fourth and fifth standard parallels south, the principal meridian, and the first guide meridian west (fig. 5). Normally, plats of this type show only the surveyed lines

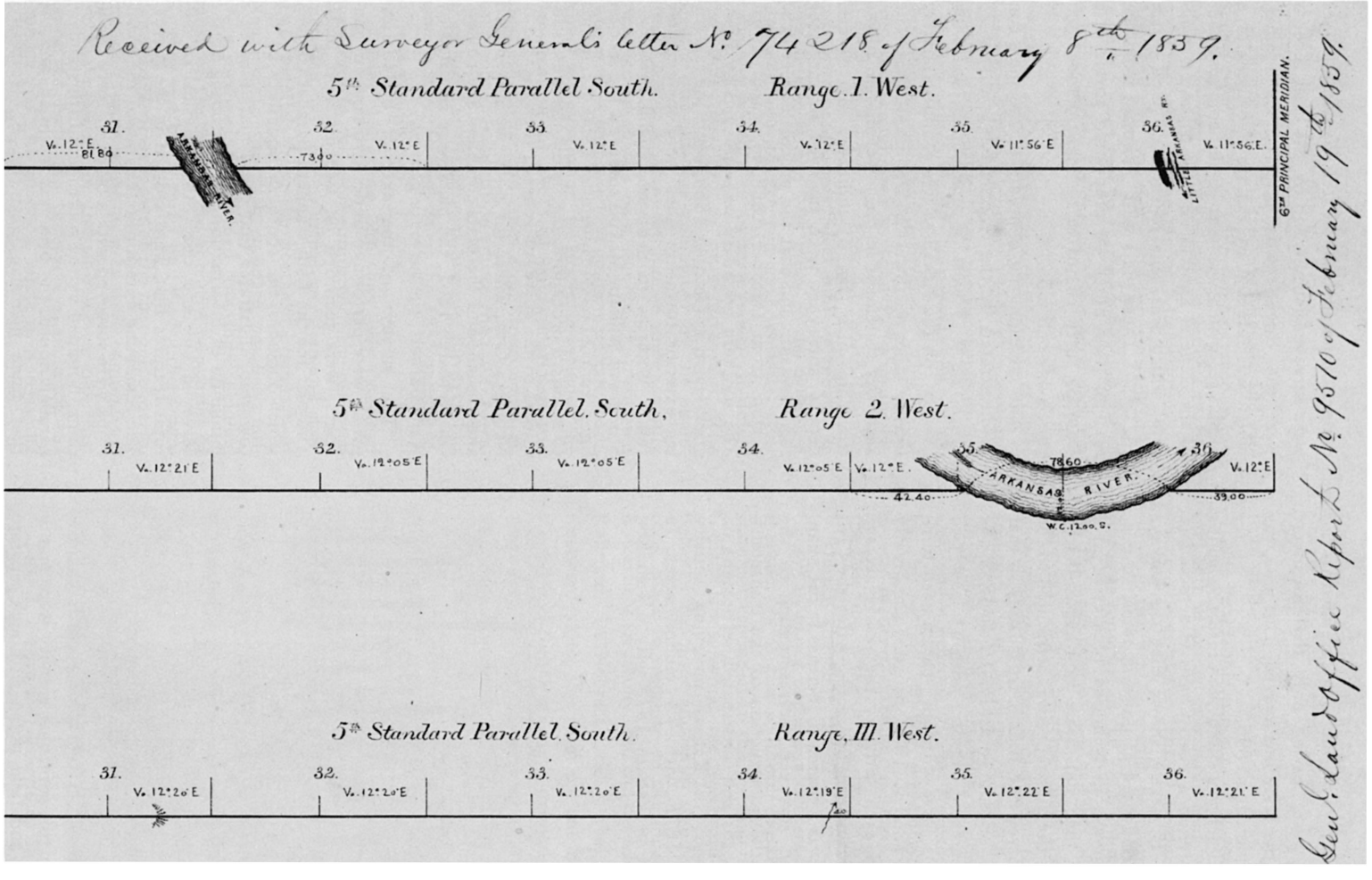

FIG. 4. *Detail of manuscript plat showing the fifth standard parallel south between the sixth principal meridian and the first guide meridian west as surveyed by Frederick Hawn under contract of 2 July 1858.* National Archives, Cartographic and Architectural Branch, Record Group 49, Kansas Exterior Boundaries, vol. 1, p. 129.

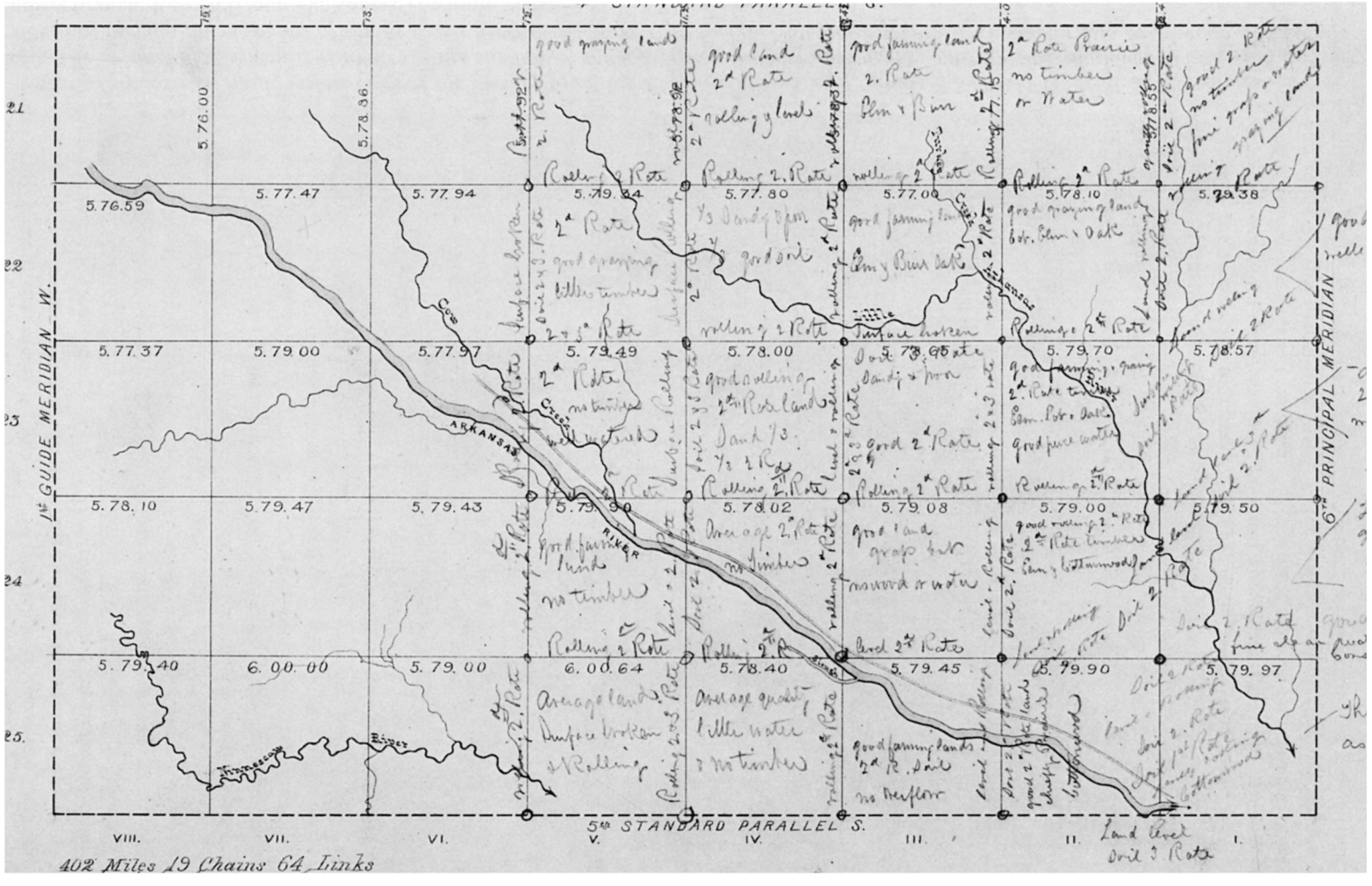

FIG. 5. *Detail of manuscript plat showing township lines for townships 21–25 south, ranges 1–8 west, Kansas, surveyed by James Withrow under contract of 6 August 1860.* National Archives, Cartographic and Architectural Branch, Record Group 49, Kansas Exterior Boundaries, vol. 2, p. 3.

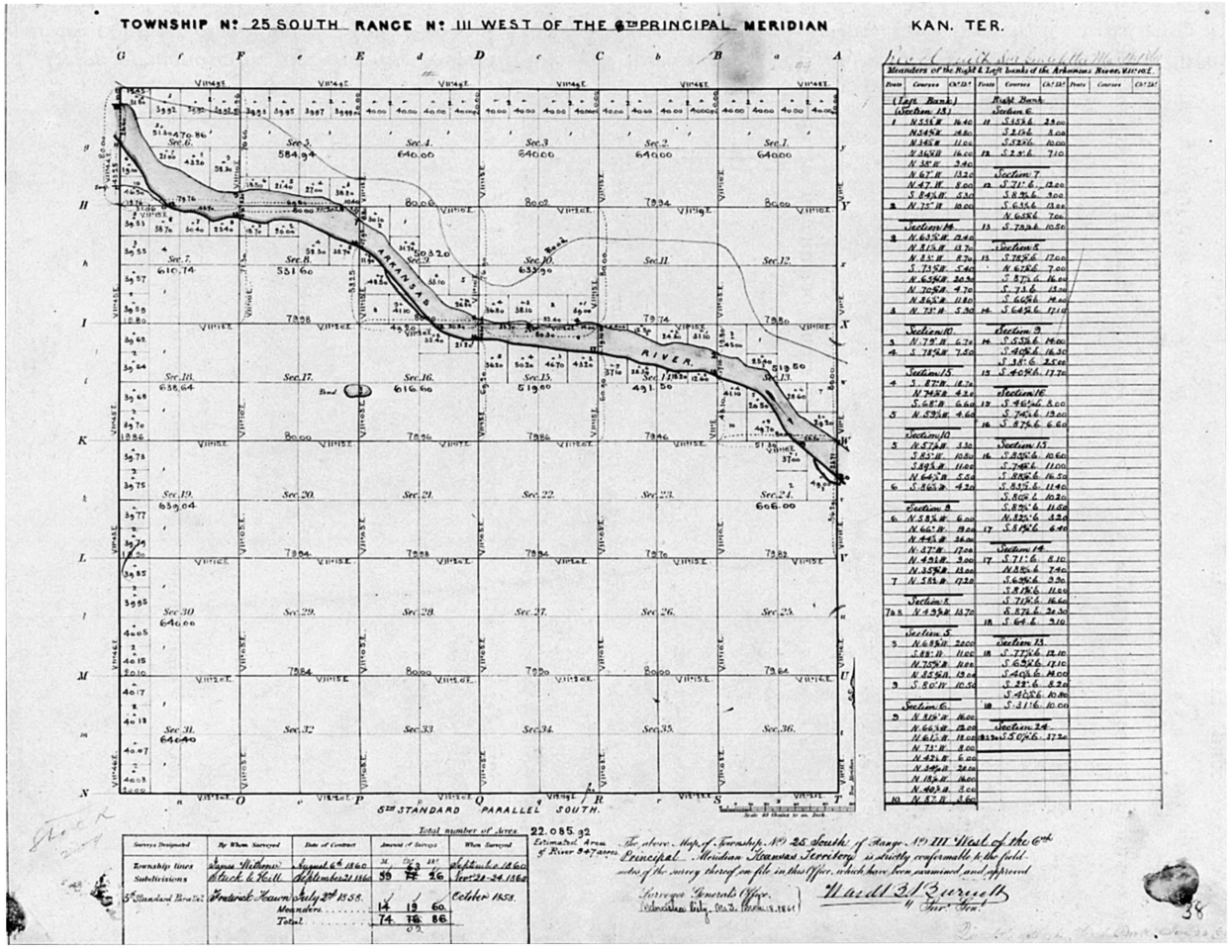

FIG. 6. *Duplicate or headquarters copy of the plat for township 25 south, range 3 west, surveyed by Stuck and Hill, 20–24 November 1860. The original plat, which is currently in the custody of the Kansas secretary of state, is the same as the duplicate copy except that it does not include the meanders of the Arkansas River listed in the right margin of the plat.* National Archives, Cartographic and Architectural Branch, Record Group 49, Kansas Township Plats.

and occasionally the basic drainage pattern or major trails and roads. In this manuscript plat, pencil annotations record the general condition of the land for each township. For township 25 south, range 3 west, the annotation indicates: "good farming lands, [second rate] soil, no overflow, level and rolling."[19]

The township plat itself represents the subdivision of the township into sections. Besides the survey lines, the plats normally show the variety of physical and cultural information observed during the survey of the section lines. The plat for township 25 south, range 3 west (fig. 6) looks rather plain, but the lack of descriptive detail is a result of the uniform land surface of the township. The only water bodies are the Arkansas River, with no tributary streams, and a pond on the line between sections 16 and 17. The only wooded area is a small grove along the Arkansas River in section 9. One road parallels the north side of the Arkansas River. No preexisting settlements are indicated and, by implication, most vegetation is prairie.[20]

This interpretation of the contents of the plat can be verified by the survey field notes. The original notes, which were recorded in the field as the surveys were conducted, were retained by the surveyor general, while a duplicate copy was sent to Washington, D.C. The field notes for the township subdivision provide a mile-by-mile description of the survey. For example, the notes for the line between sections 16 and 17 read:

> North between sections 16 and 17, variation 11°05′ East; 29.00 [chains] Enter pond (now dry), bears E & W; 38.00 [chains] Leave pond, bears E & W and about 15 chains long from E to W; 40.00 [chains] Set sandstone 15 in. long, 10 in. wide, 11 in. thick for quarter section corner; 80.00 [chains] Set sandstone 17 in. long, 9 in. wide, 11 in. thick for corner to sections 8, 9, 16, & 17; Gently rolling prairies, soil 2nd rate.[21]

The notes also include the survey of the meanders of the Arkansas River, a list of personnel involved in the survey, and a general description of the township, which in this case confirms the original interpretation of the physical and cultural features depicted on the plat. The general description reads:

> Land in this township mostly 2nd rate. Usually slightly rolling prairie with considerable level bottom along the Arkansas River. The bottom is, however, very sandy and we should suppose would not produce abundantly as farming land. The Arkansas River runs entirely through it from West to East and is now completely dry and can be crossed at any point with teams. . . . The banks are almost destitute of timber and what there is, consists of cottonwood and willow, not of much use except firewood. Neither stone or mineral of any kind discovered in the township. No settlement in the township.[22]

The triplicate copy of the plat (fig. 7), is a valuable research tool, not for the information it gives about the survey process, since that information basically duplicates what is on the other two plats, but because it graphically records the General Land Office's initial disposal of the land.[23] The third copy was forwarded to the local land offices, and as the land was sold or disposed, the register recorded on the plat, as well as in a tract book, the disposition of individual parcels of land. School lands (sections 16 and 36) were left blank; alternating sections selected by the Atchison, Topeka, and Santa Fe Railroad were marked by the abbreviation "RR." The remaining lands were marked with an X and appropriate land entry or homestead final certificate numbers. A survey of the corresponding tract book indicates that most of the public lands in the northwest portion of this township were homesteaded, with initial entries made in the early 1870s and final proof presented in the late 1870s.[24] By correlating the information found on the local office plats, tract books, and land entry papers, it is possible to recreate a cadastral map showing the original landownership in this township.

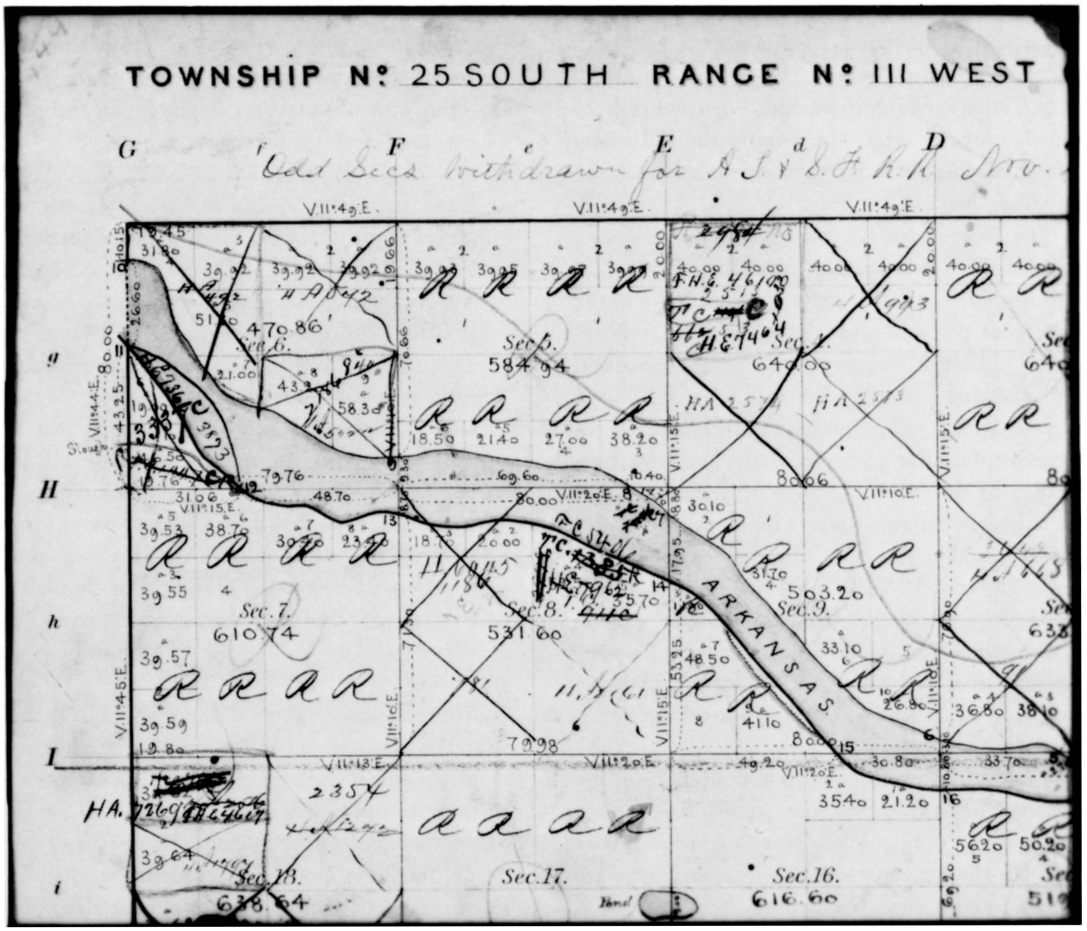

FIG. 7. *Detail of triplicate or local office copy of plat for township 25 south, range 3 west, surveyed by Stuck and Hill, 20–24 November 1860. Annotations added in local land office indicate the initial disposition of land: alternate sections marked with "RR" were granted to the Atchison, Topeka, and Santa Fe Railroad while those sections patented through the homesteading process are marked with an X and initialed with "HA" (homestead application), "HE" (homestead entry), or "FC" (final certificate).* National Archives, Cartographic and Architectural Branch, Record Group 49, Kansas Township Plats.

Examples from two other townships better illustrate the variety of information that is portrayed on the basic township plat as well as on supplementary plats compiled for separate surveys of Indian reserves. From the plat for township 11 south, range 16 east (fig. 8), the location of Topeka, it is immediately evident that there is a greater variety of information depicted—woodland and prairie, numerous roads, and a few presurvey settlements, including the town of Tecumseh (lower right corner). The plats are not comprehensive, however: streams, roads, and wooded areas are not continued in the Indian reserves. In addition, several roads are marked as crossing the township and section lines in the southern tier of sections but are not continued to their completion. There are plats for the separate surveys of Wyandott Reserve

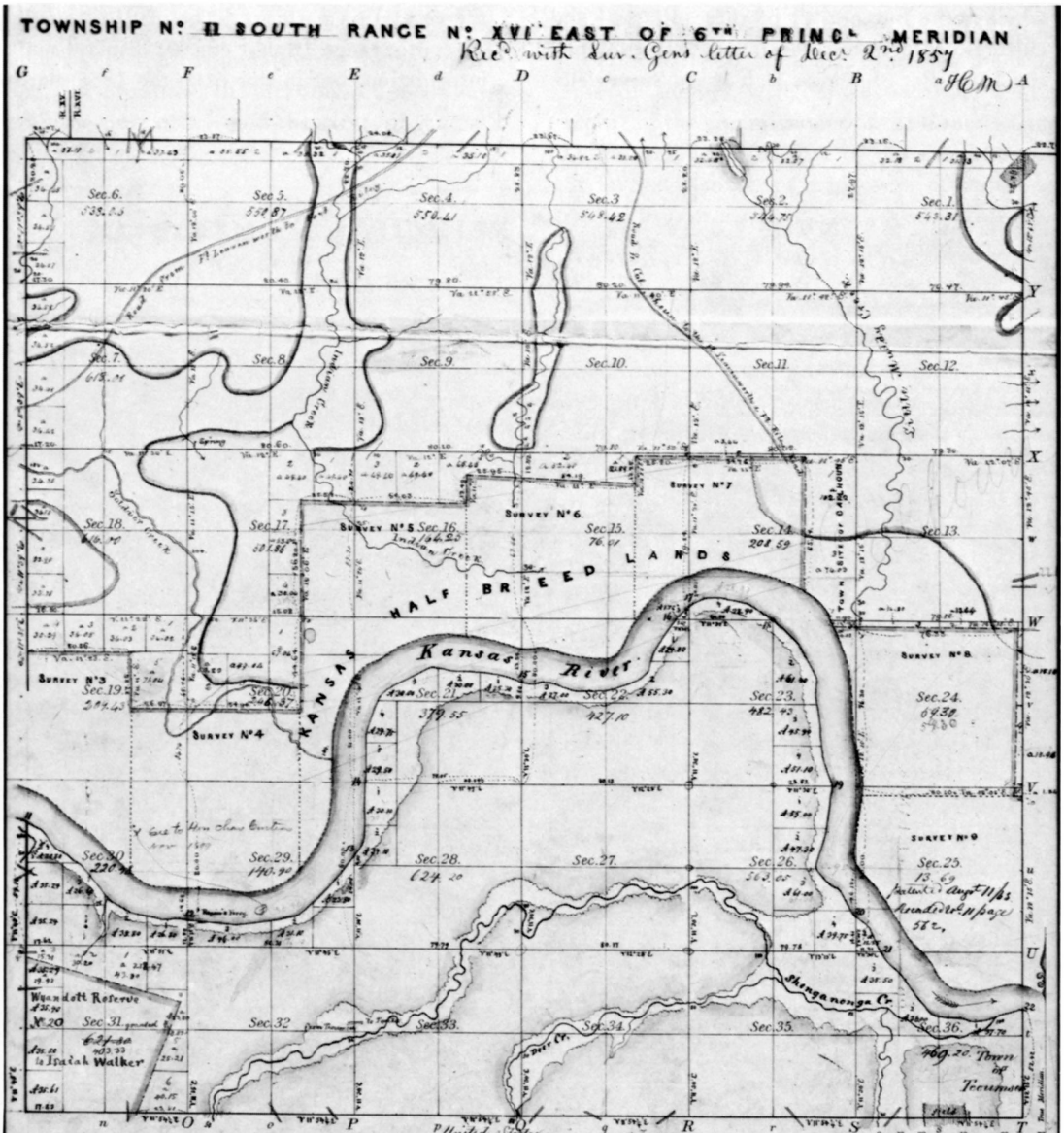

FIG. 8. *Detail of headquarters copy of the plat for township 11 south, range 16 east, surveyed by Edmund O'Flaherty, 19 January–14 February 1856. "Wyandott Reserve No. 20" in section 31 was the eventual site of Topeka.* National Archives, Cartographic and Architectural Branch, Record Group 49, Kansas Township Plats.

No. 20 and the Kansas Half-Breed lands, in which some but not all of these physical and cultural features are continued. For example, the 1864 plat of Kansas Half-Breed Survey No. 5 shows the continuation of streams but not the vegetation pattern.[25] The plat for township 12 south, range 18 east (fig. 9) displays similar information, but in this case, the 1858 plat for

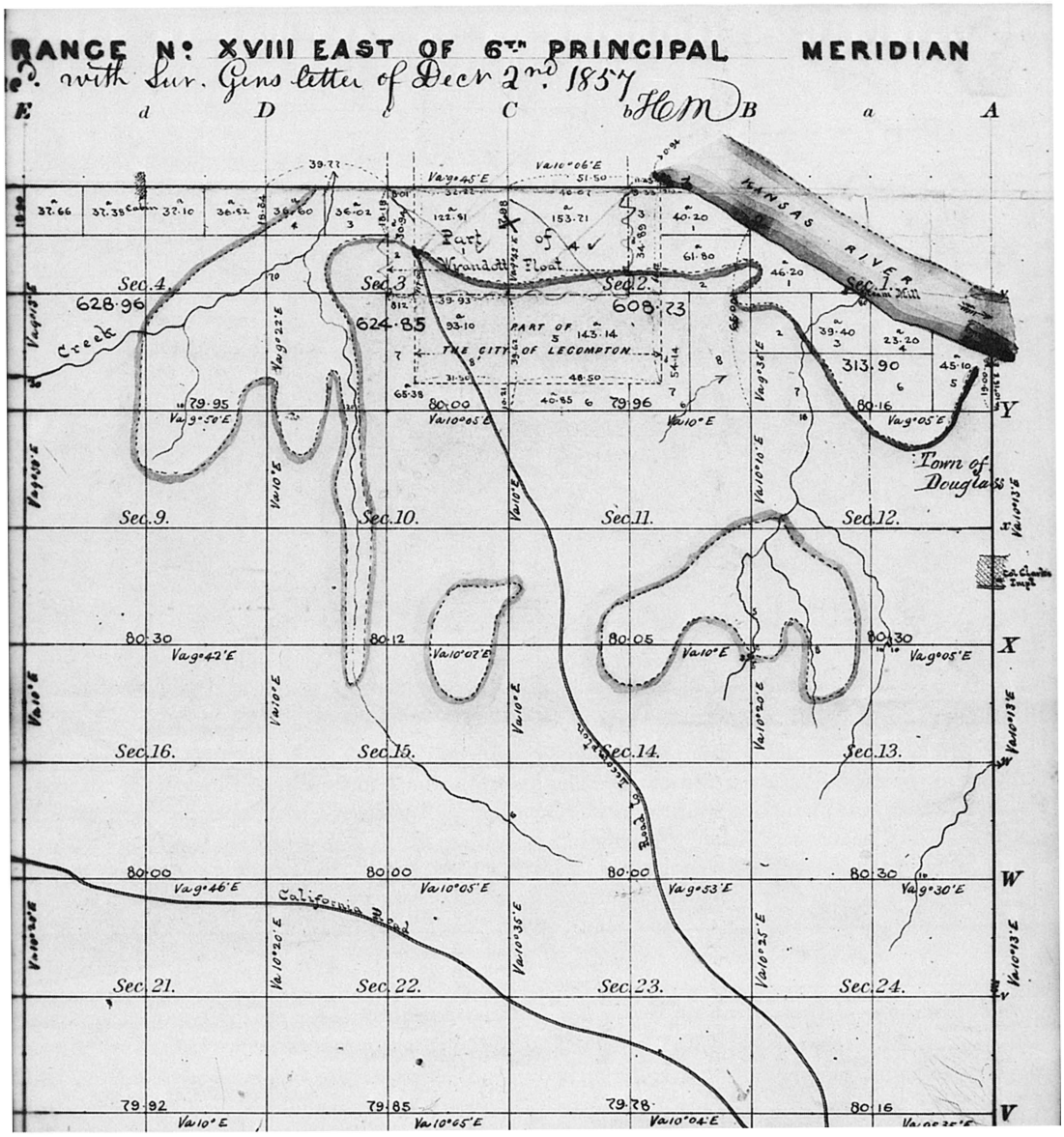

FIG. 9. *Detail of headquarters copy of the plat for township 12 south, range 18 east, surveyed by William J. Card, 5–15 March 1856. The town of Lecompton is located in the northeastern portion of this township.* National Archives, Cartographic and Architectural Branch, Record Group 49, Kansas Township Plats.

Wyandott Reserve No. 31 (fig. 10), which was used to locate the town of Lecompton, not only shows the continuation of the vegetation line, but also shows the location of a steam sawmill, the post office, and the surveyor general's office.[26]

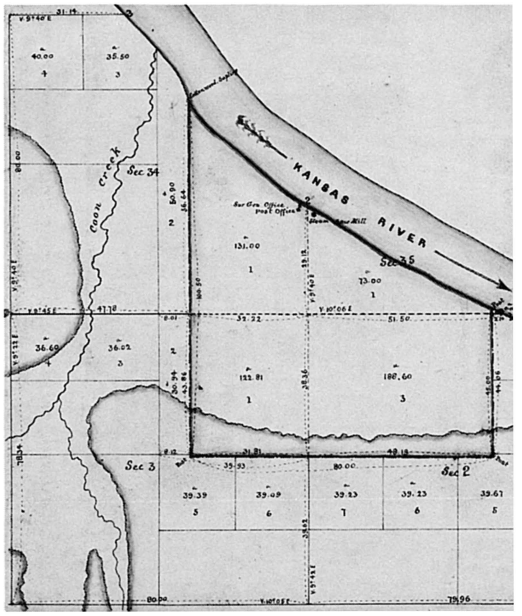

FIG. 10. *Detail of manuscript plat of Wyandott Reserve No. 31, approved by Surveyor General John Calhoun, 10 February 1858. Situated in townships 11 and 12 south, range 18 east, the reserve was used to locate the town of Lecompton. The surveyor general's office, which is shown on this plat, was located in Lecompton at that time.* National Archives, Cartographic and Architectural Branch, Record Group 49, Sac and Fox in Kansas, p. 36.

COMPOSITE STATE MAPS

Other cartographic records produced by the General Land Office during this period were composite state maps designed to show the progress or status of surveys and eventually to serve as general reference maps. The production of these maps can be divided into three chronological periods based on the frequency and source of publication and the increased amount of information depicted.

Prior to 1866, state maps showing the progress of surveys were issued with the annual report of the commissioner of the General Land Office, published as part of the Congressional Serial Set. Manuscript maps were submitted by each surveyor general to accompany his report to the commissioner. The maps were redrawn in a standard style and were issued in separate map volumes in the Congressional Serial Set. The surveyor general for Kansas and Nebraska submitted one map showing the status of surveys in the entire district, which encompassed both territories. Progress maps were issued for Kansas–Nebraska every year between 1855 and 1866 except for 1864 and 1865, when the publication of all General Land Office maps was suspended because of the Civil War.[27]

As the 1859 map (fig. 11) illustrates, the progress maps were simple diagrams, showing the base line and principal meridian, standard parallels and guide meridians, and township lines. Major rivers, a few towns, and Indian reserves were added for reference points. Completed townships were shown by solid lines and proposed surveys by broken lines. Township surveys that were completed or were in the process of being surveyed during the fiscal year were classified into several categories. For example, the 1859 map (fig. 11) shows a number of categories or stages of completion:

> Townships under contract and being Surveyed
> Townships, Surveys reported to the Office
> Townships Field and Office work West, complete, duplicates forwarded to Genl Land Office and triplicates to Local Land Office
> Canceled but field work wholly or partially completed . . .
> Townships under Contract but Contract Canceled . . .

Unfortunately, consistent categories were not used from year to year, making a yearly comparison difficult although not impossible. The original manuscript maps submitted by the

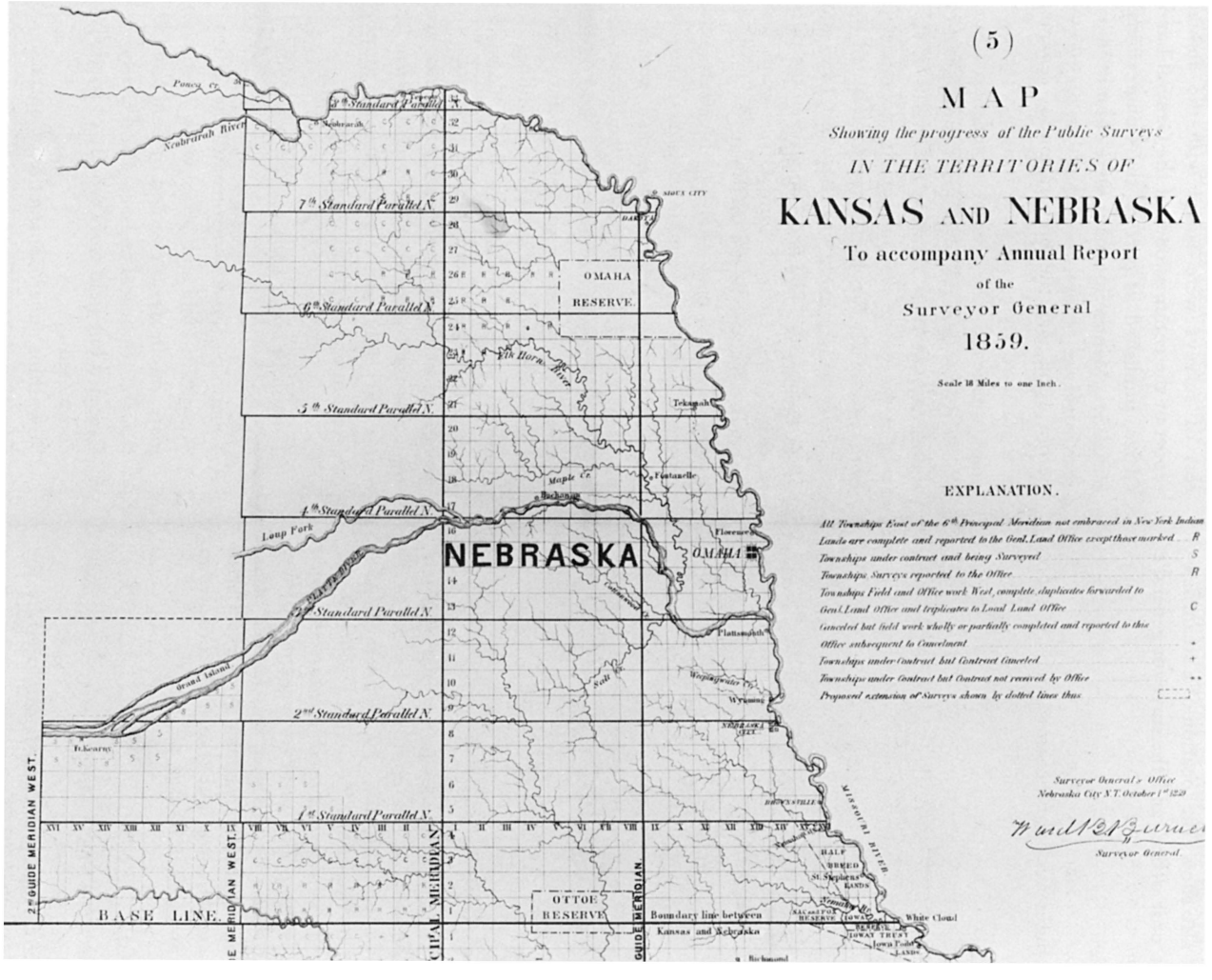

FIG. 11. *Detail of published map showing the progress of the public surveys in the territories of Kansas and Nebraska to accompany annual report of the surveyor general, 1859.* Library of Congress, Geography and Map Division, Single Map Collection.

Kansas–Nebraska surveyor general to the commissioner have survived for 1857, 1859, 1860, 1861, and 1865 and are now filed in the National Archives.[28] The information shown on the 1859 manuscript map (fig. 12) is almost the same, although the lettering is more artistic. Close inspection shows a few additional place names on the manuscript map.

The publication of progress maps was not resumed after 1866, although there are occasional references in the annual reports to progress or sectional maps that were submitted with the surveyor general's annual report. Manuscript maps have survived for Kansas from the 1870, 1871, and 1873 reports, and for Nebraska from the 1868, 1869, 1870, and 1871 reports.[29] A distinct difference from the maps published before 1866 was the preparation of separate

FIG. 12. *Detail of manuscript map showing the progress of the public surveys in the territories of Kansas and Nebraska to accompany annual report of the surveyor general, 1859.* National Archives, Cartographic and Architectural Branch, Record Group 49, Old Map File, Kansas 8.

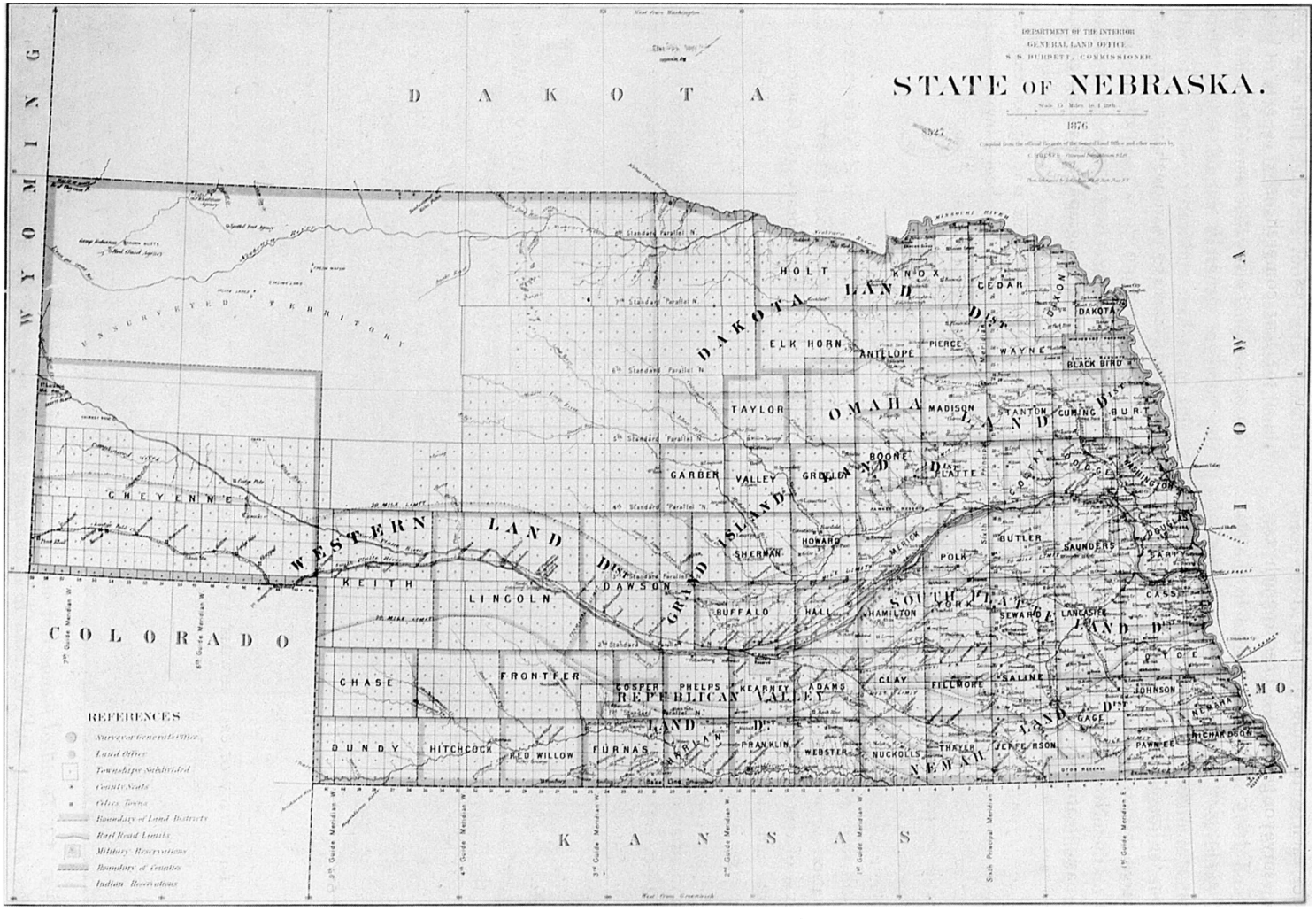

FIG. 13. *Published General Land Office map of the state of Nebraska, compiled from official records by C. Roesser, 1876.* Library of Congress, Geography and Map Division, Single Map Collection.

maps for each state, reflecting the creation of separate surveyor general's offices for each state in 1867. The later maps also show more detail, including complete drainage patterns, railroads, counties, and a greater number of towns resulting from the spread of settlement. Two unique maps from this group are the 1870 Kansas map and the 1869 Nebraska map. The Kansas map shows basic features as well as the extent of wooded areas, while the Nebraska map also shows soil types, coal deposits, and wooded areas.[30]

A third phase of state mapping began in 1876 with the publication of standard reference maps for each of the public land states. As the 1876 Nebraska map (fig. 13) illustrates, the maps still show the progress of surveys, but this information appears to be secondary to the portrayal of counties, towns, drainage patterns, railroads and railroad land-grant limits, and Indian reservations. Separate maps were prepared for each state, but they were prepared by the "principal draughtsman" of the General Land Office rather than independently in each surveyor general's office. Six subsequent Kansas editions were published between 1879 and 1925, and five Nebraska editions between 1879 and 1922.[31]

As the example of Kansas and Nebraska shows, the General Land Office's mapping activities in the Great Plains were decentralized but resulted in a set of cartographic records that was consistent in style and type of information depicted. Supervised by a small bureaucracy in Washington, D.C., most of the cartographic work was performed by a small, transitory staff in each surveyor general's office, based on survey data gathered by contract deputy surveyors. The survey of each township was often completed as a result of two or more different contracts. While the actual surveys took only several days, the time span from the initial survey of exterior boundaries to the final subdivision of the township into sections may have extended from several months to several years. Guided by preprinted township forms and a manual of instructions based on some seventy years of experience, the draftsmen and copyists produced a series of township plats that provided the first comprehensive coverage of the two states. As the progress and composite state maps indicate, it took only twenty years to map the entire state of Kansas and three-fourths of Nebraska. Although these maps do not document a single date or even a single year, they do show a transitional phase in the region's historical geography, marking the end of the exploratory era (characterized by rudimentary exploration, fur trading, and military reconnaissance) and the beginning of permanent agricultural and urban settlement.

NOTES

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1. The surveying system and techniques are discussed in Lola Cazier, *Surveys and Surveyors of the Public Domain, 1785–1975* (Washington, D.C.: Government Printing Office, 1976); John G. McEntyre, *Land Survey Systems* (New York: John Wiley, 1978); Lowell O. Stewart, *Public Land Surveys: History, Instructions, Methods* (1935; reprint, Minneapolis: Myers Printing Co., 1976); and C. Albert White, *A History of the Rectangular Survey System* (Washington, D.C.: Government Printing Office, 1983). Discussions by historical geographers on the elements of the system and its effect on the landscape include Sam B. Hilliard, "An Introduction to Land Survey Systems in the Southeast," *West Georgia College Studies in the Social Sciences* 12 (June 1973): 1–15; Hildegard Binder Johnson, *Order Upon the Land: The U.S. Rectangular Land Survey and the Upper Mississippi Country* (New York: Oxford University Press, 1976); Terry G. Jordan, "Division of the Land," in *This Remarkable Continent: An Atlas of United States and Canadian Society and Culture,* ed. John F.

Rooney, Wilbur Zelinsky, and Dean R. Louder (College Station: Texas A & M University Press for the Society for North American Cultural Survey, 1982), pp. 54–70; William D. Pattison, *Beginnings of the American Rectangular Land Survey System, 1784–1800* (Chicago: University of Chicago, Department of Geography, 1957); and Norman J. W. Thrower, *Original Survey and Land Subdivision: A Comparative Study of the Form and Effect of Contrasting Cadastral Surveys* (Chicago: Rand McNally, 1966).

2. The primary historical discussion of the laws pertaining to land alienation is found in Paul W. Gates, *History of Public Land Law Development* (Washington, D.C.: Government Printing Office, 1968). Gates, the preeminent historian of the public lands, has also discussed land policy in Kansas in *Fifty Million Acres: Conflicts over Kansas Land Policy, 1854–1890* (Ithaca: Cornell University Press, 1954) and "Land and Credit Problems in Underdeveloped Kansas," *Kansas Historical Quarterly* 31 (Spring 1965): 41–61. A good overview of the land alienation process in Kansas is presented in Homer E. Socolofsky, "How We Took the Land," in *Kansas: The First Century,* ed. John D. Bright (New York: Lewis Historical Publishing Co., 1956), pp. 281–306. The land alienation process in the Nebraska Sandhills is discussed by C. Barron McIntosh in "Patterns from Land Alienation Maps," *Annals of the Association of American Geographers* 66 (December 1976): 570–82; "Use and Abuse of the Timber Culture Act," *Annals of the Association of American Geographers* 65 (September 1975): 347–62; and "Forest Lieu Selections in the Sand Hills of Nebraska," *Annals of the Association of American Geographers* 64 (March 1974): 87–99.

The development of the administrative bureaucracy involved in the disposal of the public domain is discussed in Malcolm J. Rohrbough, *The Land Office Business: The Settlement and Administration of American Public Lands, 1784–1837* (New York: Oxford University Press, 1968). Both the surveying and land disposal records are described in Jane F. Smith, "Settlement on the Public Domain as Reflected in Federal Records: Suggested Research Approaches," in *Pattern and Process,* ed. Ralph E. Ehrenberg (Washington, D.C.: Howard University Press, 1975), pp. 290–304.

3. The General Land Office's mapping activities in two other midwestern states are mentioned in Diana J. Fox, "Iowa and Early Maps," *The Palimpsest* 59 (May–June 1978): 77–87, and LeRoy Barnett, "Milestones in Michigan Mapping," *Michigan History* 63 (November–December 1979): 29–38. The use of plats and field notes in historical research is discussed by William D. Pattison in "Use of the U.S. Public Land Survey Plats and Notes as Descriptive Sources," *Professional Geographer* 8 (January 1956): 10–14.

4. An overview of the mapping of the Great Plains is provided by John L. Allen in "Patterns of Promise: Mapping the Plains and Prairies, 1800–1860," *Great Plains Quarterly* 4 (Winter 1984): 5–28.

5. Socolofsky, "How We Took the Land," p. 288. Calhoun, who served as state surveyor in Illinois, was a friend of Abraham Lincoln, to whom he taught surveying, and Stephen Douglas, with whom he was aligned in local politics. In Kansas he was a nationally known Democrat championing the proslavery cause. See Robert W. Johannsen, "The Lecompton Constitutional Convention: An Analysis of Its Membership," *Kansas Historical Quarterly* 23 (Autumn 1957): 225–43. Sleeper, who came to Kansas from New York via Illinois, was a surveyor but became involved in local politics in Kansas. See David E. Bullard, "The First State Legislature," *Kansas State Historical Society Collections* 10 (1908): 241. The other surveyors general were either lawyers, newspaper editors, or businessmen. For example, Mark Delahay, who was trained as a lawyer, set up a newspaper when he came to Kansas. His wife was a relative of Lincoln's, and he worked actively in Lincoln's campaign before he was appointed surveyor general. See Mary E. Delahay, "Judge Mark W. Delahay," *Kansas State Historical Society Collections* 10 (1908): 638.

6. Lists of staff members appear in the annual reports of the Kansas–Nebraska surveyors general to the commissioner of the General Land Office, which were included as attachments to the latter's annual reports published in the Congressional Serial Set. The reports for 1855–1865 appear in serial volumes 810, 875, 919, 974, 1023, 1078, 1117, 1157, 1185, 1220, and 1248.

7. The contract system and the problem of

fraudulent surveys is discussed in Stewart, *Public Land Surveys,* pp. 59–75.

8. U.S. General Land Office, *Instructions to the Surveyors General of Public Lands of the United States for Those Surveying Districts Established in and Since the Year 1850; Containing also a Manual of Instructions to Regulate the Field Operations of Deputy Surveyors* (Washington, D.C.: A. O. P. Nicholson, 1855). Although this manual was the first general manual for all surveyors general, it was based on the 1851 instructions to the surveyor general of Oregon. A new manual was issued in 1871, but it was a copy of the 1855 edition. A revised edition was not published until 1881. The development of the instructions in this period is discussed in McEntyre, *Land Survey Systems,* pp. 94–110, while a list of instructions is found in Lane J. Bouman, "The Survey Records of the General Land Office and Where They Can Be Found Today," *Proceedings of the American Congress on Surveying and Mapping, 36th Annual Meeting* (Washington, D.C., 1976), pp. 261–71. Some of the earliest instructions are described in Thomas A. Tillman, "Before Tiffin? Newfound Instructions for the Survey of the Public Lands," *Proceedings of the American Congress on Surveying and Mapping, 32nd Annual Meeting* (Washington, D.C., 1972), pp. 24–30, and "Who Wrote the Earliest Instructions?" *Our Public Lands* 24 (Spring 1974): 7–10.

9. Burt's solar compass is described in Burton H. Boyum, "The Compass That Changed Surveying," *Professional Surveyor* 2 (September–October 1982): 28–31. John Calhoun, the first surveyor general in Kansas and Nebraska, expressed reservations about the use of Burt's solar compass. See Calhoun to Hon. John Wilson, 7 October 1854, in Letters Received from Surveyors General, Kansas and Nebraska, 1854–1855, and Wilson to Calhoun, 21 October 1854, in Letters to Surveyors General, Kansas and Nebraska, 15 August 1854 to 14 February 1859, Records of the former General Land Office, Record Group 49, Scientific, Economic and Natural Resources Branch, National Archives, Washington, D.C.

10. U.S. General Land Office, *Instructions to the Surveyors General* (1855), p. 15.

11. Ibid., pp. 17–18.

12. Ibid., p. 26.

13. See note 6.

14. The surveyor general's office was subsequently moved to Leavenworth (July 1855), Wyandotte (September 1855), Lecompton (October 1856), Nebraska City (April 1858), Leavenworth (July 1861), and Lawrence (May 1869). See Socolofsky, "How We Took the Land," p. 288.

15. Surveyor General John Calhoun to Hon. John Wilson, 1 June and 31 July 1855, Letters Received from Surveyors General, Kansas and Nebraska, 1854–1855, records of former General Land Office, RG 49, National Archives.

16. This composite map was reconstructed from seven maps published or prepared by the General Land Office. The 1856 and 1866 status maps for Kansas–Nebraska and the 1876 standard published maps of Kansas and Nebraska are all found in the single-map collection in the Geography and Map Division, Library of Congress. The 1871 maps of Kansas and Nebraska are available only in manuscript form in the Cartographic and Architectural Branch, National Archives, where they are filed as Kansas 18 and Nebraska 9 in the Old Map File in the records of the former General Land Office, RG 49. The 1861 status map was not available in the Geography and Map Division's single map collection but was obtained from serial volume 1120 of the Congressional Serial Set in the Library of Congress Law Library.

17. The figures in this graph were derived from the General Land Office annual reports. In addition to the serials listed in note 6, serials 1326, 1366, 1414, 1449, 1505, 1560, 1601, 1639, and 1680 were used. From 1860 on, the yearly figure is derived from tables that list the number of acres surveyed during each fiscal year. Prior to 1860, the figures are based on the acreages reported to individual land offices. Since there are inconsistencies in these figures, the graph represents general patterns rather than precise measurements.

18. The current disposition of these records is an archivist's nightmare. For Kansas, the surveyor general's copy is now in the custody of the Kansas secretary of state, while the duplicate and triplicate copies are in the Cartographic and Architectural Branch, National Archives. The original field notes and a microfilm copy of the original plats are in the Kansas State His-

torical Society, Topeka. For Nebraska, the original plats and field notes are in the custody of the Nebraska state surveyor; the duplicate plats and field notes are in the custody of the Bureau of Land Management, Eastern States Office, Alexandria, Virginia; and the triplicate copy is held by the Nebraska State Historical Society.

19. Kansas Exterior Boundaries, vol. 1, p. 129 (for fifth standard parallel south), and vol. 2, p. 2 (for exterior boundaries), RG 49, Cartographic and Architectural Branch, National Archives.

20. Figure 6 is reproduced from the duplicate or headquarters copy of the plat for township 25 south, range 3 west. The Kansas headquarters plats are filed among the records of the former General Land Office, RG 49, Cartographic and Architectural Branch, National Archives. Kansas plats are available on microfilm publication T1234, rolls 23–31.

21. Kansas Field Notes, vol. 48, p. 1165, RG 49, Cartographic and Architectural Branch, National Archives. Kansas field notes are available on microfilm publication T1240, rolls 117–81.

22. Ibid., p. 1177.

23. In the National Archives, the triplicate copy is known as the local office plat. The local office plats have been integrated in one series with the headquarters plats. See note 20.

24. The tract books and corresponding land entry papers are filed among the records of the former General Land Office, RG 49, General Archives Division, National Archives. The land entry papers are listed in Harry P. Yoshpe and Philip P. Brower, comps., *Preliminary Inventory of the Land-Entry Papers of the General Land Office,* Preliminary Inventory no. 22 (Washington, D.C.: National Archives, 1949). The research potential of these records is discussed in Richard S. Maxwell, *Public Land Records of the Federal Government, 1800–1950, and Their Statistical Significance,* Reference Information Paper no. 57 (Washington, D.C.: National Archives and Records Service, 1973).

25. "Kansas Half-Breed Indian Lands," p. 17, RG 49, Cartographic and Architectural Branch, National Archives.

26. "Sac and Fox in Kansas, Omaha in Nebraska, and Wyandotte Reserves in Kansas," pp. 36–38, RG 49, Cartographic and Architectural Branch, National Archives. The background of the Wyandotte reserves is discussed in Homer E. Socolofsky, "Wyandot Floats," *Kansas Historical Quarterly* 36 (Autumn 1970): 241–304.

27. All but the 1861 map are listed in the Newberry Library's *Checklist of Printed Maps of the Middle West to 1900,* vols. 12 and 13, *Kansas and Nebraska,* comp. Helen Brooks and Ann Hagedorn (Boston: G. K. Hall, 1981). Only the 1855, 1858, and 1861 maps are not in the Library of Congress's single map collection. These maps were located in the Congressional Serial Set, serials 813 and 843 (1855), 978 and 1001 (1858), and 1120 (1861).

28. These maps are filed as Kansas 4, 8, 10, 11, and 12 in the Old Map File, RG 49, Cartographic and Architectural Branch, National Archives. They are listed in Laura E. Kelsay, comp., *List of Cartographic Records in the General Land Office,* Special List no. 19 (Washington, D.C.: National Archives and Records Service, 1964), pp. 40–41.

29. Kelsay, *List of Cartographic Records,* pp. 41 and 58. These maps are filed in the Old Map File as Kansas 17, 18, and 19, and Nebraska 6, 7, 8, and 9, RG 49, Cartographic and Architectural Branch, National Archives.

30. These maps are not listed in August Wilhelm Küchler, "The Vegetation of Kansas on Maps," *Transactions of the Kansas Academy of Science* 72 (Summer 1969): 141–66. The use of General Land Office surveys in reconstructing native vegetation is discussed in Eric A. Bourdo, Jr., "A Review of the General Land Office Survey and of Its Use in Quantitative Studies of Former Forests," *Ecology* 37 (October 1956): 754–68. Examples of the use of General Land Office surveys in reconstructing native vegetation are found in Paul Bigelow Sears, "The Native Vegetation of Ohio," *Ohio Journal of Science* 25 (1925): 139–49; ibid., 26 (1926): 128–46, 213–31; and Walter A. Schroeder, *Presettlement Prairie of Missouri,* Natural History Series, no. 2 (Missouri Department of Conservation, 1981). The evaluation of woodland and prairie for settlement is discussed in Brian P. Birch, "The Environment and Settlement of the Prairie-Woodland Transition Belt—A Case Study of Edwards County, Illinois," *Southampton Research Series in Geography* 6 (1971): 3–31; Terry G. Jordan, "Between the Forest and the Prairie," *Agricultural History* 38

(October 1964): 205–16; and Douglas R. McManis, *The Initial Evaluation and Utilization of the Illinois Prairies, 1815–1840* (Chicago: University of Chicago, Department of Geography, 1964).

31. Kelsay, *List of Cartographic Records*, pp. 154–55. These maps are also available in the single map collection of the Library of Congress.