

## EARLY SURVEYS IN KANSAS

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TO THE TRAVELER flying over Kansas, the country below appears as a giant chessboard superimposed on the vast expanse of fertile farm land; neat squares, separated from their neighbors by roads, stretch from horizon to horizon. They represent the units of soil from which the farmer derives a living and which he calls home. If the traveler were not preoccupied with the business on hand he may well wonder who etched this chessboard design on a whole state and wonder even more when and how this gigantic undertaking was ever accomplished, and who did it. The survey must have taken place before Kansas was settled, he muses, so that the settler could get title to a well-defined piece of land in a no-man's land with primitive means of transportation and communication.

The answer should be found in textbooks on Kansas history for our schools, but they shed very little if any light on the subject. This is understandable, considering the fact that the survey began as a peaceful government activity during an era when Kansas territory was in political turmoil. The territory was in the midst of the question whether to become a free state or slave state, and would soon send volunteers to take part in the bloody war against the confederation of Southern states. It was also the time of the first transcontinental railroads, and, after the end of the Civil War, of the mass migration of people from the Eastern states, looking for good, cheap land, reinforced by a growing stream of immigrants from Europe. At the time all these things must have seemed far more important than surveying the public lands. But it was done.

### THE KANSAS SITUATION.

THE KANSAS-NEBRASKA territory was also in a unique situation geographically. It was wedged in between the already settled state of Missouri in the East, a slave state which did not secede from the United States, and New Mexico in the Southwest. Between the Anglo-Saxon culture on one side and the

Spanish-Mexican culture on the other, it had been looked on mostly as a dangerous, Indian-infested desert through which led a thin line of commerce over the Santa Fe trail.

The earliest inhabitants of Kansas were the native tribes of the Plains Indians, the most numerous and important of these the Pawnees, Cheyennes, and Arapahoes. In addition there were Indian reservations along the eastern border where the government had moved eastern tribes, displaced from a country where they did not fit into the pattern of life style instituted by the white settlers of the 13 colonies.

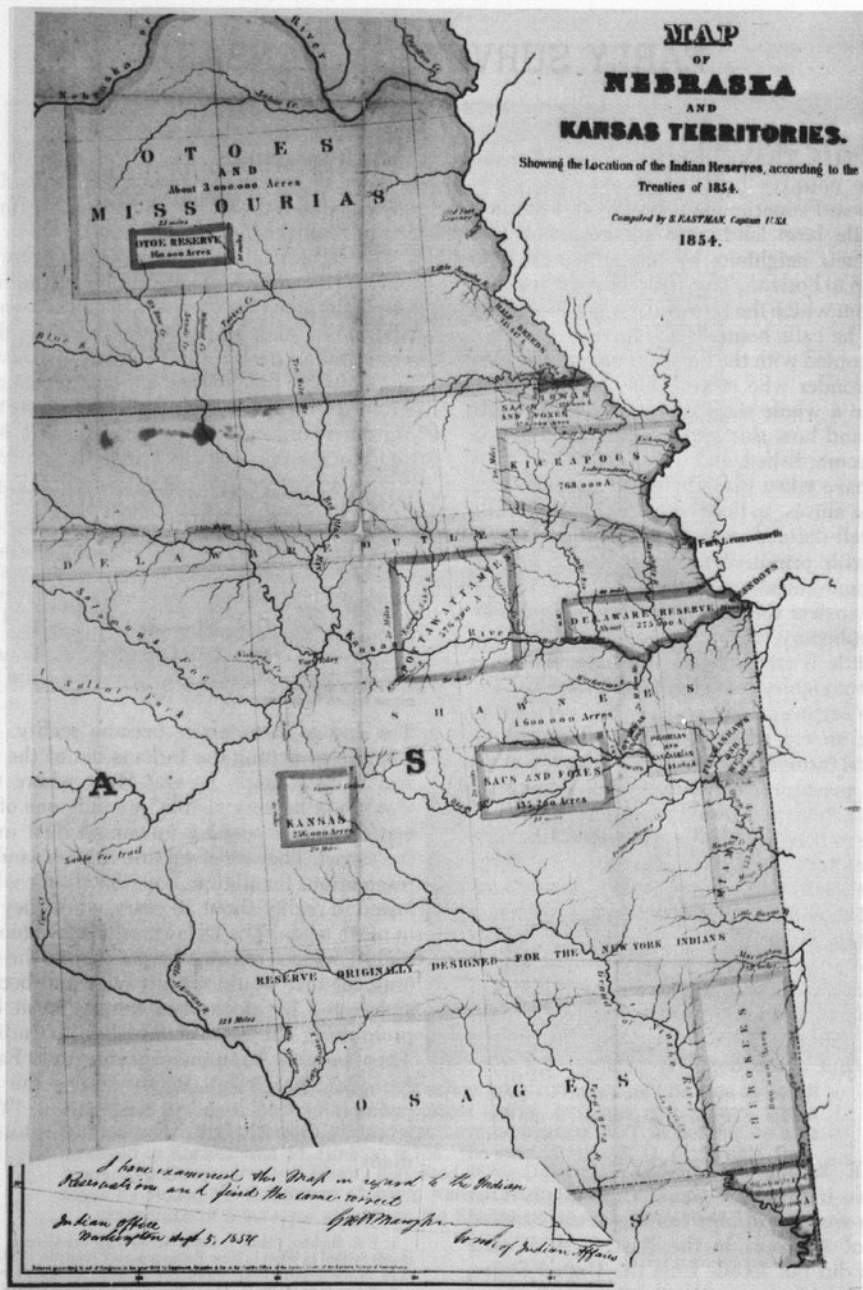
Captain William Clark, Indian Agent, summoned the chiefs of the Kansas and Osage Tribes to St. Louis in 1825 where they sold a large part of their tracts of land to be used for the resettlement of the "Civilized Tribes" of the east. They also became known as the "Emigrant Tribes."

To Isaac McCoy [Baptist missionary] was entrusted the task of resettling the tribes and surveying their reservations. He also surveyed a site 7 miles square, near the present site of Osawatimie, which was to serve as the Indian Capital of the new Indian state. Most of the 20 or more tribes were resettled by 1837.<sup>1</sup>

The Indian state never became reality. The solution to getting the Indians out of the way and to new lands far out West where they would not be very visible, reminds one of the expedient of sweeping unwanted dust under the carpet. They received title to their lands in reservations for all time, a period of time which lasted in reality about 30 years, when they had to move again. The Delawares, Pottawatomies, and Kickapoos remained a problem to the government that would not go away and became aggravated by alcoholism despite strict laws prohibiting the sale of whiskey to Indians. They became so unmanageable that Father Jean de Smet, a missionary among the Pottawatomies, exclaimed in desperation: "What could one do with two thousand drunken Indians?"<sup>2</sup>

1. J. E. Biehler, "How It Came About That Six German Immigrants Settled in What Is Now Pottawatomie County in 1854," p. 1, copy in manuscript department, Kansas State Historical Society.

2. Pierre-Jean De Smet, *The Indian Missions in the United States of America, Under the Care of Missouri Province of the Society of Jesus* (Philadelphia: King & Baird, 1841), p. 12.



As the immigration pressure increased, these Indian reservations acted as a roadblock. Lying just west of the Missouri river and along the western border of Missouri, these lands were the first desirable locations for white settlers under the protection of Fort Leavenworth in Kansas and Fort Kearny in Nebraska. The U.S. government bought back the Indian lands which reverted to the public domain. These lands were the first region in Kansas opened for white settlers, also the first surveyed in order to give the newcomers clear title to their farms after the Indian title was extinguished.

The government found itself for the first time confronted with the problem of how to best handle the public lands on its Western frontier which had grown to include the center of the continent through the Louisiana Purchase of French territories in 1803. The general philosophy of the government was to sell the area, preferably in large blocks, to individuals or corporations. The aim was to realize revenue for the U.S. treasury as a reimbursement for the original payment for the Louisiana Purchase, and for the expense of administering, policing, and surveying which entailed outfitting exploration parties and establishing military forts and connecting military roads. Heavy subventions were also needed when the construction of transcontinental railroads started. The money came partly from bonded credit to the railroads, partly in gifts of large amounts of public lands.<sup>3</sup>

3. Robert W. Baughman, *Kansas in Maps* (Topeka: Kansas State Historical Society, 1961), p. 73.

The earliest inhabitants of Kansas were native tribes of Plains Indians. In addition there were reservations along the eastern border where Indians from farther east had been resettled. When immigration pressure from white settlers increased, the U.S. government bought back the Indian lands which reverted to the public domain. These lands were the first region in Kansas opened for white settlers and the first surveyed so that the newcomers could have clear title to their farms after the Indian title was extinguished. This map drawn by S. Eastman and certified by the commissioner of Indian affairs, shows Indian reserves in what was later eastern Kansas. Dated 1854, it is one of the earliest published maps depicting the newly created territories of Kansas and Nebraska. Reproduced from *Kansas in Maps* by Robert W. Baughman.

In 1864 the Atchison, Topeka and Santa Fe railroad received from congress 20 alternating sections of land in a 20-mile wide band on either side of the line for every mile of track laid. This amounted to three million acres which the railroad in turn sold to settlers through its own land offices for \$1.00 to \$10 per acre. In 1872 it was still advertising farmland on deferred payments over 11 years at seven percent interest.<sup>4</sup> Likewise did the Union Pacific railroad still offer land for sale from Pottawatomie county to Wallace and Greeley counties in 1891.

The development of river navigation, the favored mode of transportation and travel in earlier Eastern settlements, was totally neglected in Kansas despite the fact that river boats from the Missouri had successfully ventured up the Kansas river as far as Fort Riley until an act of the state legislature declared the river not navigable, evidently favoring the influential railroads.<sup>5</sup>

A change from the philosophy of looking at the public lands chiefly as a source of revenue became visible in the Homestead act of 1862 which superseded the Preemption statute. U.S. law understands by preemption the right given to settlers on public lands to purchase them at a limited price after a term of months or years. Under the Homestead act the public lands served as a means for establishing a large farm population which automatically brought with it trade centers, cities, and tax revenue. Under this act a free quarter section of land was offered to any citizen or any immigrant who had filed a declaration of intention to apply for citizenship, beginning January 1, 1863. The conditions for a homesteader were that he must live on the land for five years during which improvements were to be made and modest fees paid.<sup>6</sup> The greatest demand for homesteads in Kansas occurred in the decade between 1869 and 1879. However, the outright sale of public lands to speculators continued. The basis for an orderly development of the public lands was established with the organization of the survey. This job became the duty

4. *Ibid.*, pp. 73, 84.

5. *Ibid.*, pp. 54-55.

6. Robert W. Richmond, *Kansas, a Land of Contrasts* (Saint Charles, Mo.: Forum Press, 1974), pp. 127-128; *Public Laws of the United States, 1861-1862*, 37th Cong., 2d Sess. (Boston: Little, Brown & Co., 1862), pp. 392-393.

**FREE HOMES IN KANSAS**

Along the Line of the ATCHISON, TOPEKA & SANTA FE RAILROAD.

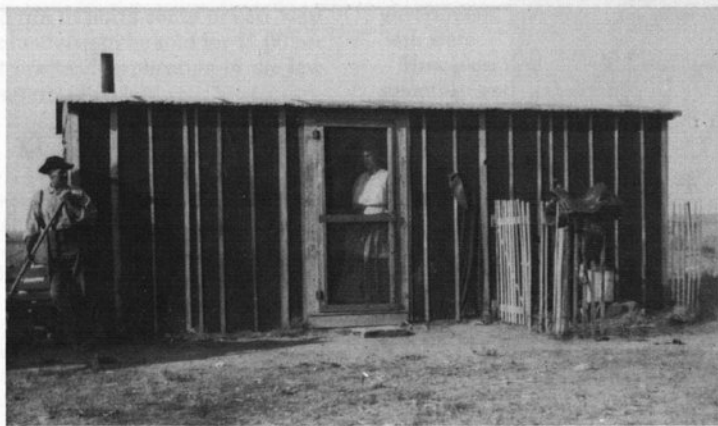
**30,000 FREE HOMES**  
In one of the Richest Valleys in AMERICA are  
WAITING for OCCUPANTS.

## 1,500,000 ACRES

**Subject to Homestead and Pre-emption in the Great  
Arkansas Valley along the line of the Railroad.**







The passage of the Homestead act by the federal government in 1862 resulted in a great movement of settlers westward. Conditions for a homesteader were that he must live on the land for five years during which improvements were to be made and modest fees paid. The greatest demands for homesteads in Kansas occurred in the decade between 1869 and 1879. This tar paper claim shack in Clay county was easily erected and as easily knocked down but adequate for its temporary purpose.

of the U.S. surveyor general, an office first held by Gen. Rufus Putnam.<sup>7</sup>

#### THE SURVEY.

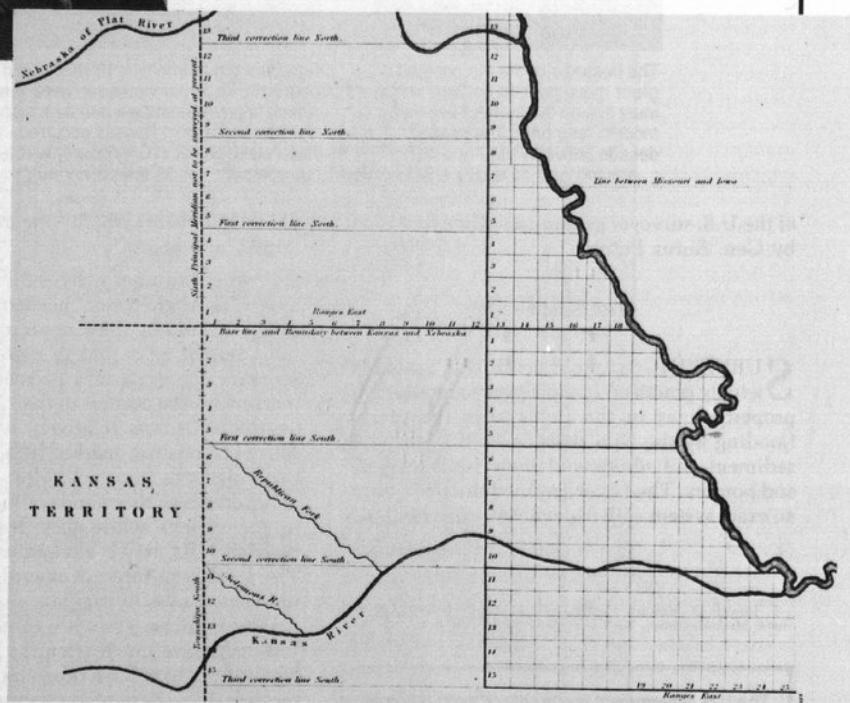
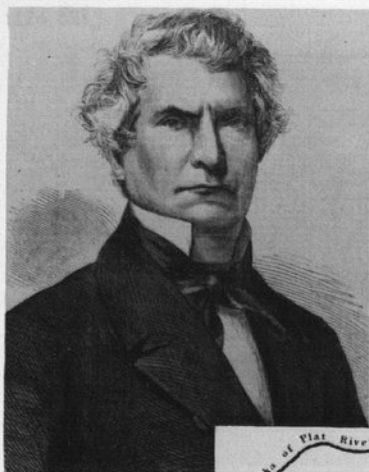
**S**URVEYING is an old art. It was probably widely practiced in old Egypt to reestablish property lines in the fields after the yearly flooding by the Nile river covered them with sediment and obliterated their former shape and borders. The Greeks refined the practice to an exact system called geometry, especially the

plane geometry which operates with lines, angles, and areas.

America with her early settlements, Spanish as well as Anglo-Saxon, needed to translate the grants of land by the Crown into correct locations on the map and to provide settlers, or pioneers, the exact measurements and official markers for the corners of their property. In the beginning it was relatively easy to do that. Maybe from a tree marked by a slash of the axe to another tree or a rock. Most settlers located along creeks or rivers and claimed their acreage in the valleys while they bypassed heavily wooded hills, rocky mountains, and swamps. The result was often overlapping borders and unclaimed areas of irregular shape in between. A more uniform system was needed. Thomas Jefferson gave much attention to the problem and is thought to have been an originator of the rectangular system of surveying as we know it today. Surveying became a very respectable business and the names of George Washington, Charles Mason, and Jeremiah Dixon were well known as surveyors and astronomers even before the Declaration of Independence. By an act of congress on May 20, 1785, the rectangular system was decreed for the survey of the public lands. It provided for the division of such territory into townships, six miles square, containing 36 sections, one mile square, all

7. Lowell O. Stewart, *Public Land Surveys: History, Instructions, Methods* (Ames, Ia.: Collegiate Press, 1935), p. 6.

The U.S. government made gifts of large amounts of public lands to railroads that would extend the frontiers of the country west. In 1864 the Atchison, Topeka and Santa Fe railroad received from congress 20 alternating sections of land in a 20-mile wide band on either side of the line for every mile of track laid. This amounted to three million acres which the railroad in turn sold to settlers through its own land offices for \$1.00 to \$10 per acre. This 1872 map issued by the railroad advertises its Kansas land holdings. It is reproduced from *Kansas in Maps* by Robert W. Baughman.



An official survey by the federal government was the basis for an orderly development of the public lands in Kansas. John Calhoun (1806-1859) was appointed surveyor general of the Kansas-Nebraska territory in August, 1854, and three months later the surveying was begun. The progress of the public surveys in the territory was shown in a set of annual maps submitted to congress, the first of which appeared in 1854. It is reproduced here from *Kansas in Maps* by Robert W. Baughman.

border lines to run in north-south or east-west direction. The land was to be sold for \$1.00 per acre. The first practical application of the law occurred in eastern Ohio.<sup>8</sup>

#### KANSAS SURVEYS.

EVERY farmer and rancher in Kansas knows that his land has a name, the legal description, e.g., SW $\frac{1}{4}$  of sec. 15, T.22S, R.12W. This formula will lead every tax assessor, highline repair crew, and oil prospector right to my doorstep. What does it mean? The southwest quarter of section 15 in the 22d township south of the Kansas-Nebraska border in range 12 west of the Sixth principal meridian, whereby "range" means a row of townships running north to south. Now it becomes confusing. Most maps list only the international standard meridians in degrees, counting east or west from the meridian of Greenwich in England to 180 degrees, the international date line. Of these geographical meridians, 95 to 102 degrees lie across Kansas soil. The principal meridians, however, are purely arbitrary meridian lines which began to be established after congress passed "An ordinance for ascertaining the mode of disposing of lands in the western territory" on May 20, 1785.<sup>9</sup> The first principal meridian governed the surveys of Ohio and Indiana, and coincided with 84° 48' 11" west of Greenwich. The Sixth principal meridian in Kansas runs through Newton and Wichita and crosses the Kansas-Nebraska border 108 miles west of the Missouri river at the northwest corner of Washington county, and coincides with 97° 22' 08" longitude.

If the state of Kansas were to be surveyed in a strictly businesslike way, without any consideration of time needed for the job and proceeding by the book (the *Manual of Surveying Instructions*, U.S. Department of the Interior, Bureau of Land Management, 1855), one would first establish the four corners of the state as defined by law, then survey the four borderlines, subdivide the area into townships and ranges and finally sectionize the townships into square miles.<sup>10</sup> The territory would then be ready for settlement, eligible to elect a

government, and could join the Union as the 34th state.

However, things didn't actually proceed so smoothly and orderly. While thousands had crossed the "Great American Desert" during the gold rush to California in 1849 and 1850 it did bring very few settlers except at the outfitting and jumping-off places along the Missouri river and the military forts. As the Indian lands became available, surveying of the northeast corner of the state received first priority while the rest of the territory was still undisputed abode of the buffalo and the Prairie Indian tribes. The survey progressed in stages here and there, depending on where farmers and ranchers settled first, and not always catching up with the demand.

The north border or base line was established first, running along the 40th parallel westerly to longitude 102°. The survey began in 1854 and on October 20, 1856, John Calhoun, surveyor general of the Kansas-Nebraska territory reported to the secretary of the interior that the first 108 miles of the base line and the Sixth principal meridian had been established. Five standard parallels south of the base line 30 miles apart extending from the Missouri border to the meridian were also established. A number of townships had been surveyed and sectionized. As Calhoun put it, "In selecting land for survey I have been governed by the settlements made and likely to be made this fall and next spring." The cost of the first partial survey amounted to \$58,897.55. An additional \$2,852.61 was spent for correcting an error in the survey of the base line which made it necessary to remove the old markers.<sup>11</sup>

Later reports stated that the survey was one quarter completed in 1861, half completed in 1869, and three quarters completed in 1872, and the active period closed in 1877. The area surveyed in Kansas at that time was 51.7 million acres. From 1910 on the figure stayed constant at 52.3 million acres,<sup>12</sup> or 82,264 square miles.

A document in the Kansas State Historical Society contains the following statement of January 8, 1878:

8. *Ibid.*, pp. 7, 16-18.

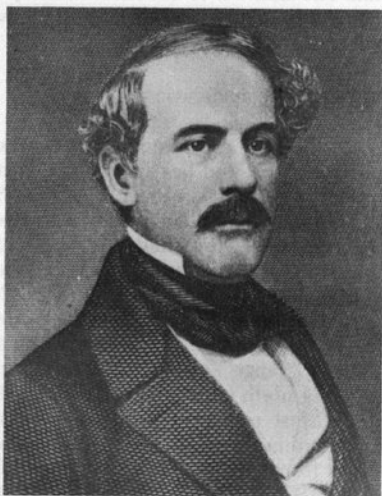
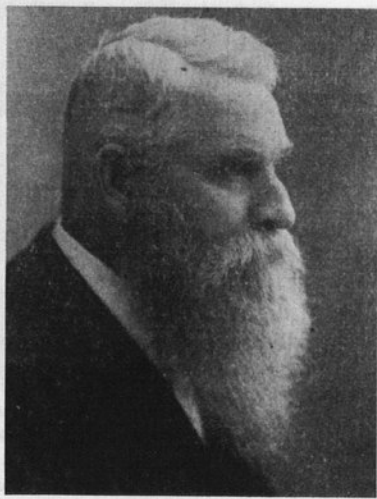
9. *Ibid.*, p. 16.

10. *Ibid.*, pp. 91-92.

11. U.S. house of representatives, "Report of the Secretary of the Interior," *Executive Documents*, no. 1, 1856, 34th Cong., 3d Sess. (Washington: Cornelius Wendell, 1856), v. 1, pt. 1, pp. 526-528.

12. Stewart, *Public Land Surveys*, p. 73.





Using as a base line the 40th degree of north latitude, the first survey in the territory extended the common boundary of Kansas and Nebraska from the Missouri river to the Rocky mountains. J. P. Johnson (1817-1898) and Capt. Robert E. Lee (1807-1870) were the first surveyors, according to an 1878 account of the first survey. Johnson came to Kansas in 1854 and was later in the banking business at Highland. In the U.S. army at the time of the survey, Lee was later the leader of Confederate forces in the Civil War.

First survey in Kansas—who ran it. It was the 40th Parallel. J. P. Johnson, of Highland, Doniphan County, says he is the person who ran the first Kansas survey line. . . . Associated with Mr. Johnson in making the astronomical calculations for the survey was Capt. Robert E. Lee, then of the United States Army, afterwards of the Confederacy. Mr. Johnson has been a resident of Kansas since 1854.

The manuscript, evidently copied from a news item, fails to mention the newspaper from which it was copied.

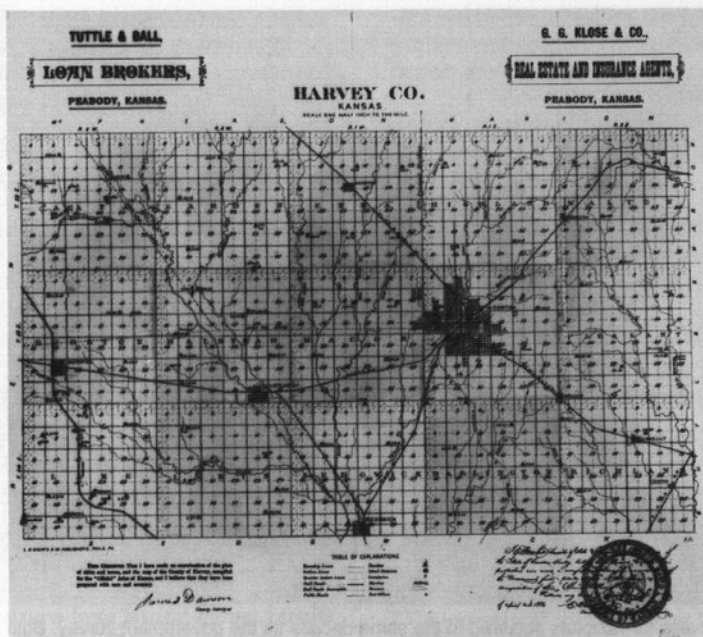
The survey of the Northern boundary line of Kansas, as has been completed, shows the total length of the line from the Missouri river to the summit of the Rocky Mountains to be five hundred and fifty-four miles. Distance in the Mountains, twenty-five miles.<sup>13</sup>

The exacting and time-consuming job of locating the 40th parallel on the ground fell to the astronomers, their heavy, delicate, and costly instruments, and their scientific skills.

13. "George Root Collection," misc. subjects—Surveyors—Surveys—Kansas, manuscript department, Kansas State Historical Society; Leavenworth *Daily Times*, October 5, 1859.

They set up shop on succeeding suitable random locations in a special tent that served as a portable observatory. Here they calculated their exact latitude and longitude by the same method used by ships on the high seas to fix their position. It required repeated observations of Polaris, the North Star, which does not stand absolutely still but seems to slide from side to side as the earth wobbles like the axis of a spinning top. The sun and several stars needed to be observed repeatedly to check results, keeping the astronomer and his assistants busy during long nights when the sky was clear, and impatiently waiting for days on end when clouds, high wind, fog, rain, or dust prevented any observations. From the data gained, the instrument position was then mathematically calculated and the astronomer could tell the surveyor how many feet north or south of the well-marked observation point the 40th parallel ran. The surveyor and his crew then ran the base line between the fixed points. Later surveys with highly refined methods





In Kansas county-making began in 1855 when the legislature defined the boundaries of 36 counties. After 1893 the state's counties with their present names and boundaries stabilized. Their final size and shape were determined not so much by the government's surveys but on political considerations. Residents of each county wanted the largest population and area possible as a basis for taxation, but at the same time they wanted a small enough area so that settlers could reach the county seat in a day's journey from any point within its boundaries. The Harvey county map of 1886, typical of individual county maps, is reproduced here from *Kansas in Maps* by Robert W. Baughman.

showed that the base line now actually runs at  $40^{\circ} 0' 07''$

The astronomer also had to establish the true north-south direction of principal meridians as reference lines for guide meridians between them. These were established in Kansas at intervals of 48 miles, while the standard parallels ran 30 miles apart. The result is a grid of rectangles containing 40 townships of 36 sections each.

"Some instructions prior to 1855 required that base, meridian, correction, and township lines should be run with an instrument that operated independently of the magnetic needle." The solar compass, invented by deputy surveyor William A. Burt, is mentioned in the 1855 *Manual of Surveying Instructions*. It became a much better instrument and replaced the magnetic compass for all exact work.<sup>14</sup>

14. Stewart, *Public Land Surveys*, pp. 87, 95.

The fact that the meridians converge toward the north pole posed a serious problem, namely how to fit a system of equal rectangles into spherical triangles formed by the equator and two meridians. The practical solution can be seen at many east-west county lines where the section lines are offset by a half mile because the distance between guide meridians becomes shorter than the distance between the geographical meridians the farther south the survey progresses from the base line.

The next job of the surveying parties was to lay out and mark the townships and divide them into 36 sections each. These were numbered by a uniform system by starting in the northeast corner counting westerly to six, then going east seven to 12 and so on back and forth ending with section 36 in the southeast corner. To illustrate the magnitude of the whole undertaking it must be remembered that after the outlines of 2,270 townships had been surveyed



Private surveys for railroads occurred in the same decade as the government survey. Both private and government surveys were carried out by civil engineers under contract agreements for distinct areas. The pay varied from \$2.00 to \$3.00 per mile or to \$15.00 per man per month. For this sum the surveyor had to pay the wages of his crew, provide all supplies and pay other costs. In Kansas difficulties encountered by the surveyors were caused more often by human interference than by problems of terrain. The government, aware of dangers from hostile Indians, provided armed troops for surveying parties. This railroad survey crew in Osage county included a detachment of infantry, at left.

there still remained 60 miles of section lines to be laid out within each township, or 136,200 miles to walk, measure, and mark corners, an almost unbelievable distance which does not include any backtracking on account of water-courses and other obstacles.

The measuring tool used was the Gunter's chain, 66 feet long, consisting of 100 equal links, carried stretched out between two chainmen. The chain had to be checked frequently against a standard chain because daily use caused wear on the end of links so that the chain became somewhat longer when stretched out. It must have worked well in flat country. Occasionally, as a substitute for the chain, a rag was tied to the spoke of a wagon wheel and the number of revolutions counted. Distances over bluffs or steep hills and across streams had to be determined by triangulation, and the surveyor had to be well versed in trigonometry. The venerable textbook *Elements of Surveying*

and *Levelling* by Charles Davies was first published in 1830 for pupils of the military academy and the upper grades of schools. A later edition, 1873, states of its contents:

A full account is given of the system adopted in the survey of public lands. . . . This method was originated by Col. Jared Mansfield whose great acquirements in science introduced him to the notice of President Jefferson, by whom he was appointed Surveyor-general of the North-western territory in the early part of the present [19th] century.

It is not astounding to find so many persons of military education and rank among the early surveyors in the United States as well as occupied with the first survey of Kansas.

Despite the most conscientious effort of the surveyors, slight errors were bound to creep in so that not all quarter sections, the final units of homesteads, are of exactly equal area. Therefore the deed to any quarter section of land always uses the statement: "containing 160 acres more or less."

The surveyors' work in the field ended when all corners were marked as permanently as possible according to the methods prescribed by the *Manual*. In wooded areas convenient trees served as corner monuments. The surveyor marked them with axe slashes, selected several neighboring trees as "witness" trees and entered their distance and bearing to the true corner in his field notes. As the surveys proceeded farther west into the treeless prairie of Kansas other markings had to be devised. One could use numbered posts driven into the ground, native rocks, or stones carried by the survey party. The latter had to weigh no less than 10 pounds when buried in mounds. Where no stones were available mounds of sod were the rule under which the surveyor placed a cylinder of charcoal (a very long lasting and easily identifiable substance) not less than six inches long and two inches in diameter. In the absence of charcoal, cinders from the blacksmith fire or even broken glass were substituted.<sup>15</sup>

In open prairie a long lasting corner results from making a mound of sod taken from four pits surrounding the mound at equal distances. The pits remain recognizable even after the mound flattens out, by the fact that the plants which eventually grow up in the depressions tend to look different from the grasses on the undisturbed soil.<sup>16</sup>

At times some unorthodox markers can be found. The records of a resurvey of sec. 22, T.22S., R.12W. in the county engineer's office of Stafford county on file, note as corner markers a sand stone, a lime stone, and a wagon skein. Even prior to statehood the territorial legislature of Kansas had declared that the section lines would be the centers of public highways. To accommodate the traffic on newly built roads the survey markers on the surface disappeared. In their places the stones of the section corners are buried in the center of the road crossings where they are safe from destruction during road maintenance with patrol graders.

Many resurveys are requested when corner markers have disappeared and the several interested land owners wish to have their borders certified by a neutral party. The surveyor is

required by law to follow the field notes of the original survey when reestablishing a disputed corner even if the original survey is found to be in error. The resurvey can never have the purpose of correcting the first survey as such action would lead to never ending litigation.

The final creation of counties has little to do with the survey. The first 36 counties were established in 1855 and the number stabilized after 1893.<sup>17</sup> A glance at the map of Kansas reveals their different shapes and sizes. They are the result of political considerations, as each county desired the largest population and area possible as basis for taxation by the ad valorem system, the earliest form of revenue for all purposes serving state, county, township, and rural school district. At the same time, a county should be small enough so that settlers could reach the county seat in one day when called for jury duty. Stafford county, as an example, was established on February 26, 1867, but underwent many changes before it became stabilized in its present shape.

The legislature of 1870 defined the boundaries of Stafford County and named it in honor of Captain Lewis Stafford, the first Kansas Infantry.

The legislature of May 15, 1875, in an effort to obliterate the county, gave a portion to each of the surrounding counties, Pawnee, Barton and Pratt but a strip 6 miles wide and 12 miles long remained Stafford County. On April 25, 1879 the supreme court decided that the act dividing the county was unconstitutional and the original boundaries were restored July 2, 1879. . . .<sup>18</sup>

While Kansas was just beginning with its first survey, similar projects were already under way beyond its western reaches. Surveys were in progress in Nevada and Utah in 1850, in Oregon in 1856, and in Washington in 1857. A journal kept by John Hudson, who was "hired in the capacity of artist—'draughtsman'" for the 1850 survey of the Great Salt Lake in Utah, covers the period from April 11 to June 28, 1850, and vividly describes the survey. With the logistic base at Salt Lake City, Capt. Howard Stansbury and Albert Carrington headed one surveying party, while a second party operated under the command of Lt. John W. Gunnison. On foot and in two boats they meandered the shoreline of the lake and

15. *Ibid.*, pp. 119-123.

16. *Ibid.*, p. 126.

17. Baughman, *Kansas in Maps*, p. 77.

18. Family Heritage Society, *Family Heritage Album of Stafford County* (McPherson: 1975), p. 12.



its islands, plagued by mosquitoes, storms, the lack of firewood and drinking water, and a mutiny by the expedition's cook and some dissatisfied crew members. Captain Stansbury quelled the hostile demonstration by unpacking "a brace of Colts," then raising the men's wages to \$1.50 per day.<sup>19</sup>

Private surveys for railroads occurred in the same decade when the government survey was rushed toward completion. By 1865 Edward L. Berthoud, a civil engineer for whom Berthoud pass in Colorado was later named, had surveyed and constructed a track from Wyandotte (Kansas City) 140 miles west to Pawnee (Fort Riley) for the Leavenworth, Pawnee and Western (Union Pacific) railroad. Plans called for an extension of the line to Denver City, Colo. Chief Engineer R. M. Shoemaker and George T. Wickes, civil engineer, made location surveys for two proposed routes, one along the Smoky Hill valley, the other up the Republican valley.

They had asked for Federal troop escorts at Fort Riley but the troops did not arrive until they had advanced 150 miles. The officer in charge had feeble health and returned to Fort Riley. Mr. Wickes organized the remainder of the troops and proceeded west.<sup>20</sup>

Wickes mentioned that no settlements existed beyond Fort Ellsworth, that "Saline City," 50 miles from Fort Riley, was a flourishing little town, also that salt and coal were discovered near Big creek, and Indian battles were fought with the Cheyennes around Big creek over these hunting and trapping grounds of the Big creek area. By the middle of November, 1865, they had reached Denver City and reported it to be a city of 12,000 inhabitants. Civil Engineer P. Golay reconnoitered the Republican valley. In January, 1866, he found "the town of Clay Center . . . thirty miles from Ft. Riley, is a store, post office, smith shop and three families. Clifton at fifty miles and Elk Creek, sixty miles are only post offices." Here he encountered hostile Indian tribes and ended his advance.<sup>21</sup>

The official government surveys were carried out like those of the railroads, by civil engineers under contract agreements for distinct areas. The pay varied at early surveys from \$2.00 to \$3.00 per mile, or to \$15.00 per man per month. For this sum the surveyor had to pay the wages of his crew, provide their food and shelter, instruments, and all transportation. The contract system ended June 25, 1910. As a whole it was successful in Kansas and without the rare occasions of fraud that had come to light in earlier surveys in the East. A case in point involved a surveyor who ran into such great difficulties with terrain and weather that he exhausted his contract pay before he could finish his project. When later surveys did not reveal any evidence that he had ever been in a certain township, it was concluded that his field notes were fabricated at home.<sup>22</sup>

In Kansas, difficulties were caused less by impenetrable terrain than by human interference which came in the eastern townships from the Proslavery-Free State conflict, and in the central and western areas from the prairie Indian tribes. The U.S. government was well aware of the dangers confronting the surveyors. An act of May 29, 1830, was designed to afford protection for them on public land by providing that

any person, who shall hereafter, in any manner, by threats of force, interrupt, hinder, or prevent the surveying of the public land of the United States . . . shall be considered and adjudged to be guilty of a misdemeanor, and upon conviction . . . shall be fined a sum not less than fifty dollars and no more than three hundred dollars, and be imprisoned for a period of time not less than one nor more than three years.

That whenever the President of the United States shall be satisfied that forcible opposition has been offered . . . to any Surveyor, or deputy Surveyor, or assistant Surveyor, in the discharge of his or their duties, in surveying the public lands of the United States, it shall and may be lawful for the President to order the Marshal of the State or District, by himself or deputy, to attend such Surveyor, deputy or assistant Surveyor, with sufficient force to protect such officer in the execution of his duty as Surveyor, and to remove force should any be offered.<sup>23</sup>

Since the beginning of the Kansas survey, opposition from Indian bands had increased to such a degree that the War Department issued an order in February, 1866, to the effect that all wagon trains were required to include no less

19. Dale L. Morgan, *The Great Salt Lake*, from *The American Lakes Series* (Indianapolis: Bobbs-Merrill Co., 1947), pp. 224-249; Journal of John Hudson, April 11-June 28, 1850, J. Hudson Collection, manuscript department, Kansas State Historical Society.

20. Wendell C. Wyatt, "Early Surveys Guide Kansas History," Surveys history collection, manuscript department, Kansas State Historical Society.

21. *Ibid.*

22. Stewart, *Public Land Surveys*, pp. 37, 69, 72.

23. *Laws of the United States, 1827-1833* (Washington City: W. A. Davis, 1835), v. 8, p. 352.

Because of Indian interference, congress in 1856 appropriated \$35,400 for the survey of the 37th parallel which was to become the division line between Kansas and Oklahoma. In command of the small army charged with establishing this southern boundary of Kansas was Col. Joseph E. Johnston (1807-1891), 1st cavalry, who kept a detailed journal of the trip. He was later a general in the Confederate army. Photograph reproduced from *Biographical Sketches of Leading Citizens of Sedgwick County, Kansas* (Chicago: Biographical Publishing Co., 1901).



than 20 wagons and 30 armed men before they would be allowed to pass Fort Kearny on the Platte trail and Fort Riley on the Smoky Hill and Arkansas river routes.<sup>24</sup>

While going through the country with chain and compass the surveyors occasionally ran their line right past the dwelling of a settler, separating it from the rest of the farm which had been carved out of a creek valley where water, grass, and some timber seemed to be ideal. These "squatters" had moved in ahead of the survey and staked out a claim which could hardly be expected to coincide with the section boundaries of the surveyors. One such incident was vividly described by Rev. J. E. Biehler.

... all the land right north of the Kaw River was in the hands of two tribes [Pottawatomies] as far west as the west line of the Pottawatomie reservation ... [which] ran through what is now Louisville [a small town north of Wamego]. ... Middle Rock Creek Valley lies just west of the Pottawatomie reservation. ...

Henry Haid, one of ... [the] German immigrants, who had served as a teamster for the military, driving

freight wagons between Ft. Leavenworth and Ft. Riley, had seen many times this broad expansive valley to the northwest as he left the Pottawatomie reservation on his way to Ft. Riley. He knew that it was not directly occupied by any Indian Tribe but yet forbidden to the white man as it was Indian Territory.

When in May, 1854, Kansas was opened up for white settlement, Henry Haid, in conversation with a group of German immigrants at Weston, Missouri, told them that he knew of a valley out west ... that was there for the asking and easily accessible from the Military Road. They could go at once; they would not have to wait on the slow government process of buying up Indian lands for white settlement.<sup>25</sup>

While the survey of the 40th parallel had been undertaken without much fanfare, the establishing of the southern boundary of Kansas was a different story. Evidently aware of the dangers posed by prairie Indians and resolved not to repeat earlier mistakes, congress appropriated on August 18, 1856, \$35,400 for survey of the 37th parallel which was to become the division line between Kansas and Oklahoma. In command was Col. Joseph E. Johnston, 1st cavalry, as director, with 500

24. Frank A. Root and William Elsey Connelley, *The Overland Stage to California* (Topeka: 1901), p. 310; Junction City *Union*, March 10, 1866.

25. Biehler, "How It Came About That Six German Immigrants Settled in What Is Now Pottawatomie County in 1854," p. 1.

soldiers. The astronomers were John H. Clark, principal assistant, and Hugh Campbell, astronomical computer. The surveyor was John E. Weyss.<sup>26</sup>

Both Colonel Johnston and Campbell kept detailed journals of the trip, and according to Campbell the survey began at the Missouri border near Baxter Springs in heavily wooded terrain. Under military escort the advance party of astronomers arrived on May 14, 1857, from St. Louis with five men, one wagon, and one ambulance. (An ambulance was a light covered wagon for the transportation of people, and also, but not exclusively, used as a field hospital.) By May 30 the astronomers had established their first camp and observation post at latitude 36° 8' 37" and proceeded to establish the meridian. Colonel Johnston joined the group soon thereafter with the main complement of troops, four squadrons of cavalry, two companies of infantry, and two mountain howitzers.<sup>27</sup> He had left Fort Leavenworth via the Fort Scott military road with three Delaware guides who misled him (six days later!) through Westpoint, Mo. (located three miles east of the military road). He carried forage for 12 days, "two-fifth of six months provision," and had sent ahead 1,000 bushels of corn.<sup>28</sup> A letter dated May 27, 1857, from a correspondent of the Missouri *Democrat*, stated: "The surveyors are already on the ground and prepared for running the southern boundary line. . . . Surveyors, commissioners, dragoons—more than one hundred wagons with their teamsters—a thousand horses and mules!"<sup>29</sup>

The beginning was less than encouraging. Campbell wrote, "It appears to rain here every other day. Owing to this state of the weather, I had the comfort of a good night's sleep. 'Want of sleep is the only bane of Astronomy.'" Colonel Johnston summed up his reaction to the weather in one word: "Troublesome."<sup>30</sup>

Nevertheless, the small army moved westward and not without excitement. One company of cavalry commanded by Capt. Thomas J. Wood, escorted the surveying party. The mules wandered away one night. One man, James Field, drowned in the Neosho river. The Arkansas river, 300 yards wide, was reached July 1. On July 15 a soldier on guard duty shot a Mexican in the quartermaster's employ. The guard "mistook him for an Indian." On July 29 a tornado blew Colonel Johnston's tent down, and the next morning Kiowas attacked the surveying party, killing the driver of the instrument ambulance and stealing the mules. Twenty-one soldiers were present at the time of the attack, but were short of ammunition. Some had one cartridge, some had none. That evening 20 rounds per man were issued.<sup>31</sup>

Although Colonel Johnston had a veritable army at his disposal, sufficient to join a pitched battle, its very size discouraged open warfare, but it was no match for the guerrilla tactics of the enemy. Cannons were useless against thieving Indians who knew the terrain intimately. Being the first organized party of discoverers to set foot on the hills and river valleys along the 37th parallel, the white surveyors and their escorts were strangers to the area. Rivers and their tributaries were known by name only because they had been frequented earlier by trappers.

The surveyors' work was often dull and tiring, but became extra demanding when the line crossed a stream, sometimes repeatedly. There were no bridges. They had to find a ford to get their equipment to the other side. The Johnston party used rafts for their loads, swam the horses across, then chained the wagon boxes to the running gear, let the horses pull them across with ropes and wrestled the wagons by hand up the opposite bank. The crews were at times exposed to rain, snow and storms, heat and cold. When supplies ran low their food could become quite monotonous. Pot bread, beans, and coffee as daily menu offers little variety unless the party happened to kill some game which was abundant in some localities.

On August 18, in the Cimarron valley a cavalry sentry fired at midnight at a mounted man

26. Nyle H. Miller, ed., "Surveying the Southern Boundary Line of Kansas, From the Private Journal of Col. Joseph E. Johnston," *Kansas Historical Quarterly*, Topeka, v. 1, no. 2 (February, 1932), pp. 105-106.

27. Martha B. Caldwell, ed., "The Southern Kansas Boundary Survey," *Kansas Historical Quarterly*, v. 6, no. 4 (November, 1937), pp. 339, 344, 347.

28. Miller, "Surveying the Southern Boundary Line of Kansas," pp. 107-108.

29. *Herald of Freedom*, Lawrence, June 27, 1857.

30. Caldwell, "The Southern Kansas Boundary Survey," p. 347; Miller, "Surveying the Southern Boundary Line of Kansas," p. 108.

31. Caldwell, "The Southern Kansas Boundary Survey," pp. 340-361 *passim*.



near the horses. He escaped. Thirty-five dismounted cavalry escorted the surveyors on the last stretch of the boundary. They reached the terminal point at the New Mexico border on September 10, 1857, almost four months and 463 miles from the start.<sup>32</sup>

Indian trouble followed surveyors through the years. Charles A. Manners, deputy surveyor general for the territories of Kansas and Nebraska, reported in 1855:

The progress of the surveys under my charge has been suspended since the third of the month, on account of the positive refusal of the Pawnee Indians to allow us to proceed. . . . some Indian (chiefs) came who refused the usual tokens of friendship, ordered us to leave in the most peremptory manner, and backed their orders with repeated threat that every man who did not leave the survey before the sun should arrive at meridian should be shot. That a "heap of Pawnees" would come across the river to do it. They then pulled up all the posts set on the north side of the river, told us they would destroy all the landmarks made in that vicinity, and that we must and should leave.<sup>33</sup>

Nearly 20 years later, August 26, 1874, the "Lone Tree Massacre" occurred during a survey in Meade county. Capt. Luther A. Thrasher saw the wagon of Capt. Oliver Francis Short, the ranking officer, standing alone in the distance. Reconnoitering with three men he found Short and his five men dead on the ground in a row. Three men were scalped, others had their heads crushed. The oxen were dead in their yokes, their hind quarters cut off. A fierce fight must have preceded the massacre. Captain Thrasher found 28 bullet holes in the wagon, eight in the water barrel. The Indians had carried off their dead and wounded. Hunters saw 25 Cheyennes about 20 miles west of the camp. The Indians had left Short's compass, chain and papers, and Cheyenne arrow heads behind in their camp. They were eventually captured, tried and convicted and sent to a government prison in Florida, but soon freed.<sup>34</sup>

#### THE SURVEYORS.

A PICTURE of the early surveys can be constructed as a mosaic of historical facts, extracted from yellowed pages of government

reports and from occasional newspaper stories of the day. But to savor the atmosphere of the down-to-earth life and problems of the surveyors on the extreme frontier in Kansas there is no better way than to read a letter written by Surveyor James B. Whitaker to his wife, Jennie. It is dated June 20, 1863, and written at Kenecuck [sic], which was located in the northwest corner of Atchison county.

Dear Jennie

We are camped here for a few hours waiting for the stage as we expect some hands for we are short handed. the cook originally hired for the trip failed us then we hired another and he is no good—you should see the bread he made the first day he is a German I thought we would never have supper but we did such as it was the first night we were out it rained hard before morning and we had not pitched our tents it was too dark when we camped—and every thing had to be arranged—we have a good lot of men at least they appear so quite civil well behaved—five good yoke of oxen & three wagons—beside there is another party along with us that have 2 wagons and four yoke a third party is a head about three days and a fourth is still behind all of us go into the same country In deed the four contracts lay in a square two each way ours is the South West contract being in Kansas near the Republican which runs through it there will be about 50 men in the four frontiers all armed with first rate rifles with cartridges &c also Government Tents—we have an old hunter with us to take care of the teams and hunt. beside which we have 18 sacks of flour 2 of meal 1 of salt, bbl of crackers one of sugar and one of dried apples—bag of beans also some rice 800 lbs of Hams & bacon beside other things—

I am afraid that I made a bad selection of shoes I think I got shaved in several things that I bought They all appear good however except the shoes my shirts are too short I had to buy blankets shirts pants shoes &c which nearly used up my money If I had another pair of shoes I should be all right perhaps I will as it is I am almost sorry that I did not go back with Young and take the State road that I ran out until it crosses this but perhaps it is best—but I would like to see my wife and children if I could—you must write me about Sunday a week from tomorrow and direct to Fort Kearney care of H. Hackbush Dep United States Surveyor—we will get to the fort about the time the letter does after which we will hear only from the fort semi occasionally as we will be about 50 miles from there or more still we will sometimes send there as our provisions will be stored there when I shall always write you.

I would like to have you mention the letter you send and you receive from me—also please write in your next if you have heard from father and what you wrote about it in the letter that I hope to get today as I may not get it—also if you have at any time anything in particular that you want to let me know about please mention it in two letters as I do not expect to receive more than one half that you write. I hope

32. *Ibid.*, pp. 365-367.

33. U.S. General Land Office, *Annual Report, 1855* (Washington: Beverley Tucker, 1856), p. 183.

34. Mrs. F. C. Montgomery, "United States Surveyors Massacred by Indians, Lone Tree, Meade County, 1874," *Kansas Historical Quarterly*, v. 1, no. 3 (May, 1932), pp. 266-269.

you will not have any trouble with the cows and other things. . . .

Yesterday noon a company of Red Legs<sup>35</sup> rode up to the party who are with us . . . and showed a Telegraph from Blunt to stop Missourians from crossing the Plains as we came up they thought that they would make a good thing as they demanded \$30 a piece from each man that they permitted to go. McKee showed them his passport which made them draw in their horses a little and when Hackbush told them that we had government tents and 10 good Rifles to each party furnished by uncle Sam and that we intended to use them to protect ourselves with from any who thought best to molest us They turned their horses rode off a little way stopped had a long talk among themselves took a good drink of whisky apiece and rode away.

Please get a Poor mans plaster— and wrap it up in a coarse towel and send it to Fort Kearney. . . . you may send me one or two Leavenworth or St. Louis papers. . . . Yours J. B. WHITAKER.<sup>36</sup>

35. "Red Legs" were members of the Kansas territorial militia, and were commanded by Gen. James G. Blunt.

36. J. B. Whitaker to Jennie [his wife], June 20, 1863, copy in "J. B. Whitaker Collection," manuscript department, Kansas State Historical Society.

**T**HE FOLLOWING list of events occurring between 1859 and 1871 supplies information on some early surveyors whose names and activities were mentioned in contemporary newspapers.

#### 1859

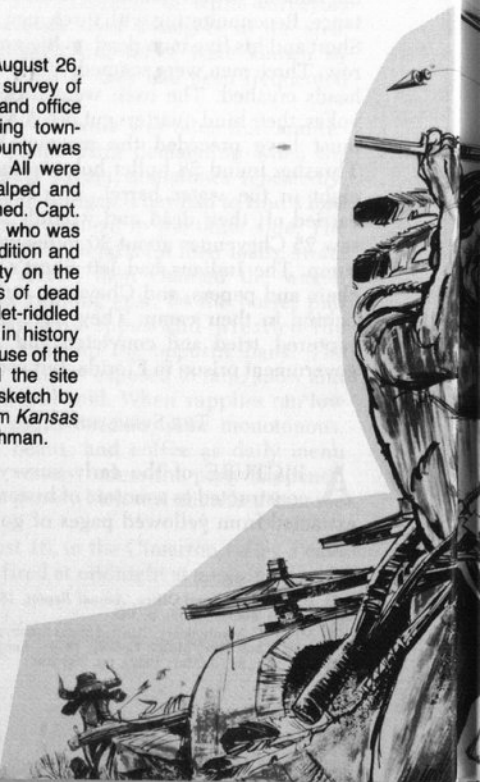
The deputy U. S. surveyors are at work completing the survey of the N. Y. [Indian] Lands. To Mr. Van Zandt was allotted the work of determining the Southern Boundary of these Lands, and of Townshiping all that portion, lying East of Town 12. Capt. Gaines has a large party at work Sectionizing the eastern portion. Mr. McKee, and Mr. W. C. Ransom, are engaged farther west.—*Fort Scott Democrat*, July 14, 1859.

Nov. 30—This morning Capt. McComb, with an escort of 32 men, with 15 wagons and three carriages, arrived. . . . Capt. McC. went almost to the head of the Cimeron [Cimarron] to place a monument, thus establishing the corner between Texas and Kansas.—*Leavenworth Daily Times*, December 23, 1859.

#### 1860

A surveying party, numbering eight persons, headed by

The "Lone Tree Massacre" of August 26, 1874, was a tragic event in the survey of Kansas. A party of six general land office surveyors which was establishing township section lines in Meade county was attacked by Cheyenne Indians. All were killed with three of the men scalped and the others with their heads crushed. Capt. Luther A. Thrasher (1833-1903), who was second in command of the expedition and engaged with another field party on the fatal day, discovered the bodies of dead men and oxen and their bullet-riddled wagon. The incident went down in history as the Lone Tree Massacre because of the lone cottonwood which marked the site until blown down in 1938. This sketch by William M. Nye is reproduced from *Kansas in Maps* by Robert W. Baughman.



Mr. Withrow, of Leavenworth, passed through this place [Emporia] Wednesday. They are on their way to the Arkansas, by the direction of the Surveyor General of Kansas and Nebraska, and before returning will complete the survey of that portion of the Territory lying along Turkey Creek, Little Arkansas and Cow Creek. They went directly South from here to the South line of the New York Indian Lands, for the purpose of tracing that line to its Western terminus.—Leavenworth *Daily Times*, September 2, 1860.

## 1861

We are pleased to welcome Captain MacKey to our city. He had feared he had been lost in the snow or fallen a victim to hostile Indians, but are glad to learn that, after a most unpleasant expedition, he has at last returned "safe and sound," having completed the survey of the Kansas Indian reserve. He was much delayed by snow storms of unparalleled extent and violence. As an indication of the unprecedented fall of snow, he states that the Blue rose 20 feet at Manhattan.—*Daily Herald*, Leavenworth, March 3, 1861.

Surveyor General Delahay gives notice in the last *Times*, that the office of Surveyor General of Kansas and Nebraska has been ordered removed from Nebraska City to Leavenworth City, where it will be opened on the 14th August.—*Kansas State Record*, Topeka, June 29, 1861.

## 1862

The survey of the P.R.R. has been commenced at Wyandotte. It is intended to survey . . . up the south side of the Kaw to near Mill Creek, where the Kansas Central commenced their survey three years ago. From there on up to Fort Riley. . . . Col. Medbury, late of Columbus, Ohio . . . is in charge of the surveying party.—*Os-kaloosa Independent*, July 19, 1862.

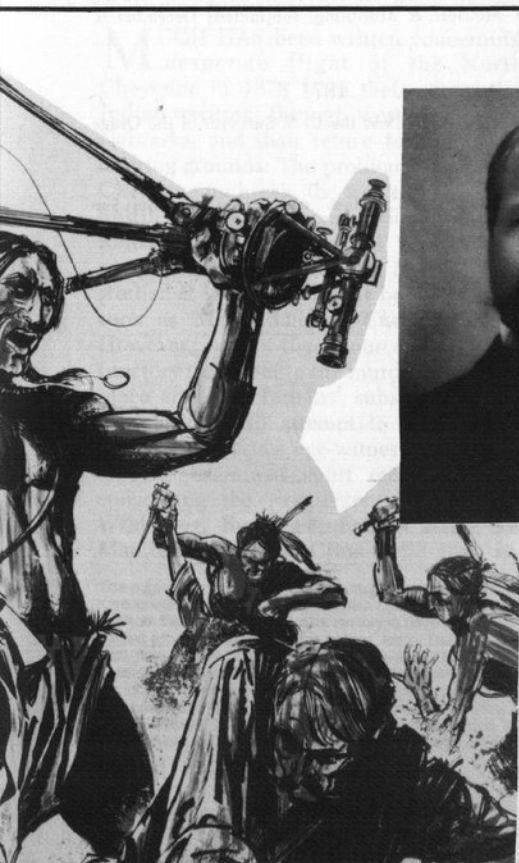
## 1864

NEW SURVEY.—Divania Furrow, our County Surveyor, has the job of surveying forty townships, from a point ten miles west of Salina, and running thirty miles south and thirty-five miles north. He has two parties already engaged in the work, and will soon start out himself with a third.—*Smoky Hill and Republican Union*, Junction City, October 8, 1864.

## 1865

Messrs. McKee and Angel have gone to the Solomon country to extend the surveys. Their work is in the neighborhood of the forks of that stream, about one hundred miles up. They had a large escort of cavalry.—*Junction City Union*, July 1, 1865.

DULY REPORTED.—Divania Furrow, whose scalp was last





week reported to have been jayhawked by our "noble red brethren," made his appearance on our streets the other day. It didn't require a scientific examination of his head to produce the fact that his scalp was still where it ought to be. He don't know anything about the stories which have been afloat. He saw a number of wild Indians but they did not trouble him. He is laying off Uncle Sam's domains for settlement.—*Junction City Union*, July 15, 1865.

A Corps of Surveyors, in charge of Captain P. Goley have been in camp near town for a few days. They started Friday morning for their labors on the Republican. To the Captain is assigned the duty of running a line for the Railroad via the Republican to the 100th Meridian of longitude. He has a company of twenty men, a good outfit, and an escort of three Companies of Cavalry. A pleasant journey to them.—*Junction City Union*, September 23, 1865.

McKEE AND ANGELL'S Surveying party arrived in this place Thursday evening. They have been at work on the Solomon, over a hundred miles above its mouth, since last June.—They report a magnificent country up there.—*Junction City Union*, September 30, 1865.

The party under Capt. Wicks, who are surveying the Smoky Hill route for a railroad, are about one hundred miles east of Denver, on Sand creek, coming west.—*Junction City Union*, November 11, 1865.

### 1866

The *Kansas City Journal* says Major B. F. Kerr died in that city on Friday last. He was engaged in the early surveys of Kansas and Nebraska.—*Junction City Union*, March 31, 1866.

### 1867

Diefendorf's surveying party, with an escort of twelve men, is working on the Smoky Hill southwest of Hays. As soon as he finishes . . . he intends to stop work, regarding his escort is totally insufficient.

Goodrich's surveying party, which is working in the immediate vicinity of the post, has an escort of twelve men only.

Armstrong and McClure's are camped near Fort Harker, waiting an escort. These escorts are always promised, but never furnished when needed—the invariable response of local commanders being "no troops."—*Leavenworth Conservative*, August 18, 1867.

### 1870

List of names of those engaged in the survey of T.33, R.22W.

Edward Stebbins	chainman
Samuel Heu	"
Jacob A. Rhode	"
Henry E. Heu	"
Grippy Thomas	"
John Kaufman	"
H. H. Courtney	axeman
Louis Walter	"
John Crary	"
Chas. Wright	flagman
Wm. E. Harwig	"
W. M. London	"
Peter Cosgray	compassman
Peter Dickson	"

Robert Armstrong took contract for this survey Oct. 28, 1870. McClure & Armstrong, sub[mitted] December 9, 1870.<sup>37</sup>

### 1871

Col. A. J. Angell was the U. S. Surveyor of the Osage lands.<sup>38</sup>

37. "George Root Collection," misc. subjects—Surveyors-Surveys-Kansas.

38. *Ibid.*