117

CHAPTER III

THE GENERAL LAND OFFICE WITHIN THE DEPARTMENT OF THE INTERIOR

THE PERIOD 1849 — 1910

The first major act of Congress affecting the public land surveys under the new Department was passed on *September 9, 1850,* 9 Stat. 452, admitting California to the Union, which was never organized as a territory. The new State received sections 16 and 36 in each township as well as other grants.

Also on *September 9, 1850,* 9 Stat. 453, the Territory of Utah was established, which included the lands between California and the Continental Divide and between 37° and 42° north latitude.

On *September 20, 1850,* 9 Stat. 466, Congress passed the first major act granting land to subsidize the construction of railroads. Lands had previously been granted to aid in construction of roads and canals. The railroad was the NEW method of transportation. The act granted the even-numbered sections, 6 and/or 15 miles each side of the right-of-way in Illinois, Mississippi, and Alabama for constructing the Chicago and Mobile Railroad, which later became the Illinois Central. Most of the lands had already been surveyed so this large grant did not in itself immediately affect the surveyors.

The *Act of September 27, 1850,* 9 Stat. 496, created the Office of Surveyor General in Oregon and extended the rectangular system to that Territory. It also allowed the "geodetic method" for executing the surveys.

This geodetic method was meant to be surveying by use of an alidade and plane table, making a topographic map at the same time as the survey of township and section lines. The method was never used, except that a special set of geodetic notes were made along the Willamette Meridian. A transit was used to cut in peaks and other topography so that the surveys could first be made in the best agricultural areas.

The act also granted donations of 320 acres to a single man and 640 acres to a man and wife who were settlers in the Oregon Territory. The boundaries of these Donation Land Claims (DLC's) were supposed to follow section subdivision lines wherever possible. Similar donations had been made to settlers in Florida in 1848 and 1849. Most of the DLC's were taken up in what is now the State of Oregon; fewer were taken in Washington. After the State boundary between Oregon and California was officially surveyed, one claim was found to be partly in California, but was honored anyway.

On October 11, 1850, William Gooding was appointed Surveyor General of Oregon; he refused the job. On November 26, 1850, John B. Preston in Chicago, Illinois, was notified of his appointment to the position. Preston travelled to Washington, D.C., and was briefed in March 1851. He gathered equipment, four solar compasses which were diverted from Michigan, transit, sextant, and chains. Preston travelled over the Isthmus of Panama, where he wrote to Butterfield on April 30, and arrived in Oregon City in May, where he established his office. He made a reconnaissance of the Columbia and Willamette Rivers, established the initial point for the Willamette Meridian in the hills west of Portland at the end of May, and let contracts for the initial surveys. This meridian controls all the surveys in Oregon and Washington. The meridian line, running south, was surveyed by James E. Freeman from Wisconsin. The meridian running north and the baseline east to the Cascade Mountains and west to the Coast Range were surveyed by William Ives. Freeman was from Wisconsin and Ives from Michigan. All of the early surveys were made with a solar compass.

The *Appropriations Act of September 28, 1850,* 9 Stat. 515, states in part: "That hereafter the meridian of the observatory at Washington shall be adopted and used as the American meridian for all astronomical purposes, and the meridian of Greenwich, England shall be adopted for all nautical purposes." The Washington Meridian was used to describe State, territorial, and Indian boundaries until repealed *August 22, 1912,* 37 Stat. 342. The Washington Meridian is 77° 03′ 02.3″ in longitude west of Greenwich.

Another major act was passed on *September 28, 1850,* 9 Stat. 519; the so-called *Swamp Lands Act.* The *Act of March 2, 1849,* 9 Stat. 352, had granted the swamp lands in Louisiana to that State only. The 1850 act extended the grant to Arkansas and all other States then in the Union and granted all "legal subdivisions" (sixteenth, section or fractional lot), the greater part of which was "wet and unfit for cultivation." If less than half the legal subdivision was swamp land, no part of it was granted. The *Swamp Lands Act* was extended to Minnesota and Oregon on *March 12, 1860,* 12 Stat. 3. It placed a large burden on the Deputy Surveyors and Surveyors General. They were not always able or inclined to carry it out faithfully within the intent of the law. As already briefly described, the act was difficult to administer; the States involved were supposed to pay the costs inherent with the determinations, and making up of the lists. Various methods were to eventually develop; for example, Florida set up a "Board of Internal Improvement" by an act of its legislature on January 24, 1851. This board was to handle the swamp lands, make examinations, determinations, and lists. Arkansas set up a "Board of Swamp Land Commissioners" with basically the same function. Illinois and Missouri appointed commissioners for the purpose. In some cases, the plats were used to determine the swamp and overflowed lands, in others the field notes.

The Secretary of the Interior and Commissioner insisted that this was a land grant of public lands and that title could not be passed to the States until the lands were surveyed and properly identified. Yet, on July 12, 1858, Commissioner Thomas A. Hendricks admonished Warner Lewis, the Surveyor General at Dubuque, for having surveyed an island which was mostly swamp even though Wisconsin paid for the survey of it. Hendricks told Lewis he had no authority to survey such lands because they would pass to the State anyway. It is a strong probability that many swamp lands were granted to some States, especially, Louisiana and the Everglades in Florida, without being actually surveyed. The lists made up by the State Surveyor General of California were in certain cases proven fraudulent.

Although the swamp and overflowed lands were a massive headache, they did not have any effect on the system of rectangular surveys, only the information to be obtained while doing those surveys in the field. The present rules for swamp and overflowed lands are well described in the *1973 Manual of Surveying Instructions,* Sections 7-95 through 7-99; only incidental mention will be made of them hereafter in this book.

On December 13, 1850, the Territory of New Mexico was

created by Presidential Proclamation, which included what is now Arizona, New Mexico, and part of Nevada.

The *Appropriations Act of March 3, 1851,* 9 Stat. 598, provided for a Surveyor General of California; on March 24, 1851, Samuel D. King was appointed to the position. King also travelled to Washington, D.C., for briefing and received three solar compasses, transit, and other equipment. King followed Preston across the Isthmus and arrived in San Francisco on June 19, 1851, where he established his office. He contracted with Leander Ransom on July 8, 1851, for the establishment of the Mount Diablo Meridian. Ransom reached the summit of Mount Diablo on Thursday, July 17, 1851, and excavated or drilled a hole in the "haycock shaped" solid rock of the highest pinnacle on the mountain to mark the initial point of the Mount Diablo Meridian, but he couldn't measure and run line off the mountain peak. He got on line south of the initial point approximately 12 miles from it, and through a series of offset lines running east and north, established the corner of townships 1 north and 1 south, ranges 2 and 3 east. He then ran the baseline west toward the initial point and the surveys in California were underway.

The *Act of March 3, 1851,* 9 Stat. 631, provided for appointment of commissioners to handle the multitude of private land claims in California. After the commissioners verified the claims, the surveys were to be made under the supervision of the Surveyor General.

The most signficant action taken in 1851 affecting the rectangular system of surveys also occurred on March 3; the first *Manual of Surveying Instructions* was officially issued. It was written to the Surveyor General of Public Lands in Oregon and was prepared by John M. Moore, Principal Clerk of Surveys. It isn't certain just what Moore's true position was at that time. A private act of Congress dated *February 1, 1849,* 9 Stat. 759, titled "An Act to Compensate John J. Moore," refers to Moore as "late Chief Clerk in the General Land Office." Moore became Chief Clerk about 1815; he may have retired but was hired to write the 1851 and 1855 Manuals because of his vast knowledge of the public surveys. There can be very little doubt that Moore actually wrote most of the opinions on and instructions for the surveys to the Surveyors General and others, even though they were signed by the current Commissioner or himself as Acting Commissioner during his employment as Chief Clerk.

John Preston and Samuel King were issued a supply of the 1851 Oregon Manuals for their use in Oregon and California, so it was immediately entirely applicable in those States. On March 13, 1851, a supply was sent to Boyd at Donaldsonville, Louisiana, with instructions to construct mounds at corners in accordance with the Manual. On July 16, 1851, a supply was sent to Lorenzo Gibson at Little Rock with similar instructions. On April 23, 1851, Manuals were sent to George B. Sargent at Dubuque, Iowa, with instructions to run his range lines north to intersections with the correction lines and establish closing corners according to the Manual.

On October 8, 1851, Sargent was instructed to resurvey T. 90 N., R. 3 W., Fifth Principal Meridian, Iowa. The original surveys had been made in 1836 and 1837, many of the corners were missing, and in places, mounds called for at corners where "timber abounds." Most of the township was sold, but the residents petitioned for a resurvey. The township was to be resurveyed, all found corners honored and held, and all missing corners restored by double proportion. Sargent was to tie in all improvements and lines of occupancy as a basis for "an exchange of deeds" by the settlers if they desired, where the resurvey put improvements onto someone else's land.

In the *1851 Annual Reports,* Charles Noble in Detroit recommended hiring an "Inspector of Surveys" to help prevent frauds and grossly erroneous surveys. Sargent in Dubuque reported that he was withholding a small percentage (10 percent) of each contract to pay for examiners of surveys; thus, the deputy was indirectly paying for the examination of his work.

On March 8, 1852, Noble was instructed to hire an examiner of surveys on a per-diem basis. That letter also started to classify the different types of resurveys being made in Michigan. Part of that letter follows:

> "The surveys about to be undertaken will be designed to remedy two classes of defects and frauds.
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> *FIRST CLASS. Incomplete Surveys.* — Where a *portion* only of the lines in a township is found to have been actually surveyed—and wherein some lines have been run and some corners established, which lines and corners can now be found. That portion of such original surveys which shall have been determined to be thus available, by retracing the same, is to remain undisturbed, and be respected whether there have been sales made therein, or not — and the residue of such townships must be surveyed, as if originally, but made to connect in all particulars with the former.
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> *SECOND CLASS. Fraudulent Surveys* — Where there is no evidence found in the field of any good intent on the part of the Deputy Surveyor to comply with the terms of his contract — No system being manifest in the field work, and an entire absence of marks and monuments whereby to designate the *corners,* and where no lines are *traceable*—.
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> In this class of cases the lines will have to be run and corners established, as if originally, and all the old irregular lines and corners must be most carefully and thoroughly *obliterated,* but their connections with the true survey must be taken and exhibited in the notes so that they may be represented on the township plats and thus be never likely to mislead — but in cases where, amongst such irregular surveys, there has been any tract of land *sold* which is *settled* upon and *occupied* according to the irregular lines of the original survey, if the same are found, they are to be particularly respected, *provided* the occupant *insists* on having the same *preserved;* but, in case he shall not so insist, then, with his expressed *written consent,* duly *attested,* the Deputy Surveyor may disregard such old irregular lines, and establish new regular lines as the boundaries of such section — But when an old irregular section corner is insisted on being *maintained* by the occupant of the tract, such, as a necessary consequence, will have also to be respected as governing the boundary of the adjacent sections, the lines of which will close on such corner. The marks on all such "bearing trees" as are not adopted, must be most effectually and indelibly, obliterated — and the new "bearing trees" will of course be marked with the usual initials, N. B. T."

The letter goes on to say that the examinations of the resurveys should begin toward the end of the fieldwork so that the two operations would be completed about the same time for comparison and not cause delays. In future years, the gap between the fieldwork completion and then the examination would sometimes be several years.

Most importantly, though, Butterfield was trying to classify resurveys. In his first class, he is describing a combination of what we call a dependent resurvey and a completion survey. Where actually originally surveyed, such as a half township, the corners were held fixed, and the other half was treated as never having been returned as surveyed at all. The difference is that he was connecting the new work to the old, and not closing against it, as surveying is done today.

In the second class, he is describing what now is called an independent resurvey, with the exception that today, the occupants' land is surveyed as a tract and is given a tract number, then the new work is closed against the tract. Butterfield is connecting the new work to the old tract, which would in all probability cause some heavy distortion in the connecting lines. The true independent resurvey as it is now known was not instituted until 1897.

In March 1852 the Minnesota-Iowa boundary was surveyed; it was to be along the parallel of 43° 30′ north latitude, from the Mississippi River to the Big Sioux River. The initial point on the Mississippi, monumented with an iron post, was established by Thomas J. Lee of the Topographical Bureau of the U.S. Army by astronomic observations in the fall of 1849. Sargent at Dubuque had been instructed to survey the line but never got a contract going. In March, Sargent finally contracted with Captain Andrew Talcott, an astronomic surveyor, for the work. Talcott sent a crew under Deputy Surveyor, James Marsh, ahead of him to run a random line with a Burt solar compass. Talcott's crews then came along running the line with a transit on a tangent line. They extended the range line between T. 100 N., R. 3 and R. 4 W. in Iowa to an intersection with the boundary. From this point on, corners were to be established at every half mile to stand and be marked as quarter section, section and township corners on the south boundary of T. 101 N., in Minnesota. At every 48 miles, an astronomic station was set up, the true parallel of 43° 30′ north latitude determined, and a falling measured to it from the tangent line. Corner moves were then computed for moving the temporary points on the tangent over to a true parallel of latitude and permanent quarter and section corners monumented. Thus the south boundary of Minnesota was established as a standard parallel for the rectangular net as well as a State boundary. It was later used as an auxiliary baseline of the Fifth Principal Meridian controlling the surveys west of the Mississippi River in Minnesota. The random line run by Marsh was used as a check on the astronomic positions and corner moves. As it turned out, the line run by Marsh, an experienced surveyor, agreed all the way and all the astronomic observations and calculations would not have been necessary. The Minnesota-Iowa boundary was surveyed between April 1 and September 6, 1852.

On July 10, 1852, Sargent was instructed to adopt the Oregon Manual to govern the surveys in Minnesota. He was to get the Minnesota surveys under way by running guide meridians and standard parallels in accordance with the Manual. The letter also instructs him to use standard parallels and "check" meridians in Iowa and Wisconsin and thus avoid double corners wherever possible. On May 16, 1853, nearly identical instructions went to Warner Lewis, the new Surveyor General.

The *Deficiencies Appropriations Act of July 21, 1852,* 10 Stat. 15, provided that no further geological surveys would be made by the government unless authorized by law, which halted the geological surveys in the Michigan-Wisconsin country.

On August 19, 1852, Merriwether L. Clark at St. Louis was instructed to contract for the resurvey of T. 8 N., R. 5 E. and T. 14 N., R. 2 E., Fourth Principal Meridian; and T. 15 N., R. 4 E., Third Principal Meridian, in Illinois. He was to hold all original corners in place and execute the surveys in accordance with the letter of October 8, 1851 (double proportion — T. 90 N., R. 3 W., Iowa). All improvements were to be shown as the basis of the "exchange of deeds."

Up until this time, double proportion was the method used to resurvey a "sold" township in Michigan, Indiana, Iowa, and Illinois.

The *Appropriations Act of August 31, 1852,* 10 Stat. 76, made provision for the survey of several large islands off the coast of California, including Santa Cruz, San Miguel, Santa Rosa, San Bernardino (San Clemente), Santa Catalina, San Nicolas, and Santa Barbara. The surveys were to be executed by the USCS under instructions from the GLO, with plats and field notes to be returned to the GLO. On April 1, 1853, Commissioner John Wilson instructed A. D. Bache of the USCS to tie in a corner of the rectangular system on the mainland, triangulate to the islands, run section lines, and meander the islands, similar to what was supposed to be done in the Florida Keys. But again, no rectangular surveys were made, or none have ever been found if there were any. Funds for these surveys were again appropriated in 1853 and in later years, but no plats were ever sent to the GLO. The islands were never surveyed as part of the rectangular system.

On September 16, 1852, John Wilson, who had been Acting Commissioner during much of Butterfield's tenure in office, replace him as Commissioner of the GLO.

On October 4, 1852, King in California contracted with Henry Washington to establish the initial point and survey of the baseline of the San Bernardino Meridian. Washington climbed to the "top of San Bernardino Mountain" on November 8 and erected a monument and flagged it, but he couldn't run line or measure from that initial point. On November 17, he began from a point S. 45° W. from the monument, ran west 7 miles, 47 chains, thence north 5 miles, 42.80 chains, to a point due west of the monument. By his computations, he was then 13 miles, 9.80 chains west of the initial point; from there he began his surveys of the baseline. Other surveys many years later ended up with two other "initial points" in addition to Washington's.

Henry Washington was an experienced surveyor who had worked extensively in Florida and Louisiana prior to emigrating to California. His work was excellent, but having to establish an initial point on a remote mountain peak was a handicap not even he could fully overcome.

The *Act of January 22, 1853,* 10 Stat. 152, amended the *Act of June 12, 1840,* and again provided for transferring the plats and field notes to the State when the public land sur-

veys were completed, on the provision that the State had to designate an office to accept the records and provided free access to them. All transfers of the survey records to State control since 1853 have been made under this law. After closure of a Surveyor General's office, the Commissioner of the GLO became "ex-officio" Surveyor General.

The *Act of March 2, 1853,* 10 Stat. 172, created the Territory of Washington, beginning the breakup of the Oregon Territory. The new territory included all the country west of the Continental Divide, north of the Columbia River and the 46th parallel of latitude.

The *Act of March 3, 1853,* 10 Stat. 244, is probably responsible for the partial surveys of townships and the problems which that practice has caused ever since. The title "An Act to provide for the survey of the Public Lands in California, the granting of Pre-emption Rights therein, and other purposes," may be misleading because most of the provisions were put into practice elsewhere under the wording of the appropriations acts.

The act provides for the duties of the Surveyor General in California. He is to execute the public land surveys and survey the confirmed private land claims and has all the authority that had been given to the Surveyor General in Louisiana. The provision in Sec. 3 of the act states: "That none other than the township lines shall be surveyed when lands are *mineral* or are *deemed unfit for cultivation;* and no allowance shall be made for such lines as are not actually run and marked in the field, and where *necessary to run.*"

The mineral lands had been excluded from the Donation Land Claims in Oregon. Now the mineral lands were being excluded from the surveys in California as were lands "deemed unfit for cultivation." The deputy surveyors were being placed in the land classification business, the result being that only the more easily surveyed lines not known to contain gold or other valuable minerals were run in the field. The surveyors were being paid by the mile and picked the gravy; they ran only those lines they found to be necessary in surveying the section lines. These partially subdivided townships with protracted outlying quarter-sections have caused many problems in the present-day resurveys.

Sec. 4 of the act allowed for use of the geodetic method of surveying and it also allowed for a departure from the rectangular mode of surveying and subdividing the public lands. There is no known instance in which those two provisions were used. Except for the private land claims (Spanish and Mexican grants) and later the mineral surveys, all of the public lands in California were surveyed by the rectangular system.

Sec. 6 of the act provided for preemption on the surveyed or unsurveyed public lands, except private claims, school or other state lands, and the mineral lands. Thus the mineral lands in California were excluded from both survey and preemption.

On October 6, 1853, Colonel Henry Washington established the initial point of the Humboldt Meridian on the summit of Mount Pierce in north-western California. Once again, a nearly inaccessible mountain peak was used for erecting the initial monument. Washington began the survey of the Humboldt Meridian from a point on line north of the initial point, but because of the ruggedness of the terrain, dense brush and timber, very few surveys were made in the Humboldt system until many years later. The Surveyor General couldn't get deputies to contract for surveys there at the price allowed by law, which was $15 per mile.

On October 17, 1853, Wilson instructed Lewis in Dubuque and John Loughborough in St. Louis to survey some islands in the Mississippi River and "other navigable streams" during the ensuing winter months, on the ice. Wilson thought it much easier to do it that way and they could get the work done for $6 per mile as a result. Of course, everyone knew that the regular township and section lines and meanders of lakes were often being surveyed in the winter in Michigan, Wisconsin, and Iowa. If the snow wasn't too deep, it was much easier to get around when the ground was frozen. But this is the first instance in which the practice was given official sanction by the Commissioner.

In the Annual Reports of 1853, George Milbourne in Little Rock and Loughborough in St. Louis reported that Arkansas, Illinois, and Missouri had refused to accept the field notes as a basis of swamp land lists. They also reported that levees had been or were being built along the Mississippi River. Levees and cut-offs were being made along the Red River in Arkansas, which would shorten that river by some 92 miles. Ditches were being dug to drain the lands, thus changing their character; after drainage took place, it wasn't very easy to tell what was swamp land before drainage. Manmade avulsions would throw ownerships on the other side of the river.

On December 31, 1853, Wilson wrote to Loughborough on the subject of resurveys. The settlers in T. 48 N., R. 5 E., Fifth Principal Meridian, had petitioned for a resurvey. Private land claims were involved; apparently there was no government land remaining. Wilson refused to approve a resurvey on several grounds. He thought the *Act of February 11, 1805,* was specific because the measurements and areas returned by the Surveyor General on the original plat were final. Only in extreme cases should the government become involved in boundary disputes and then, only with specific approval by Congress, along with funding. He thought that unless Congress passed a law relative to resurveys and how they should be done, the problem should be left up to a "competent and trusty" surveyor, who could prove that a resurvey was really necessary, in which case the settlers could petition Congress for the resurvey. He concluded the letter by saying, "With the foregoing remarks I dismiss the subject for the present. . ."

From then on, very few resurveys were made unless public lands were largely involved; instead, the work was diverted to the County and other local Surveyors. These men began almost immediately to write letters to the Commissioner requesting advice on how to do resurveys, restore "lost" corners, and subdivide sections. There were no official instructions for resurveys, such as the Manual was for surveys. Due to the history of the many corrective resurveys, many County Surveyors tried to and often did move original corners to their "proper" position, particularly quarter-section corners. Various methods were used to restore lost corners; confusion and litigation soon followed.

The *Act of May 30, 1854,* 10 Stat. 277, created the territories of Nebraska and Kansas. The Nebraska Territory included the vast area north of 40° north latitude between the Continental Divide and the Missouri and White Earth Rivers. The Kansas Territory was approximately the area be-

tween 37° and 40° north latitude between the State of Missouri and the Continental Divide.

The *Act of July 17, 1854,* 10 Stat. 305, extended the Donation Land Claims to Washington Territory and estabished the office of Surveyor General there.

On August 12, 1854, James Tilton was notified of his appointment to be Surveyor General of Washington. His instructions were sent on August 31; to continue with the surveys west of the Cascades and the Willamette Meridian network. He was to get manuals from Gardner in Oregon and use the same platting style. Tilton was especially warned to "secure" his office against fire. "No explosive fluid is ever to be used in lighting the office, and the hearth of the fireplace or stove should be so guarded as to the possibility of fire coming into contact with the floor."

After the Florence fire in 1827, orders were issued to all Surveyors General to rent separate buildings for their offices, not connected to or closely adjoining any other building. No one was allowed to live in the same building that the Surveyor General's office occupied. Several plans were devised for constructing fireproof buildings and metal-encased vaults to house the records, but none of those plans were ever funded. The Surveyor General had to rent space at the lowest reasonable rate, which was about $500 per year. The warning to Tilton was prophetic. He opened his office in Olympia by March 1855. From Charles K. Gardner in Oregon he got the Washington plats, field notes and supplies, and continued the established survey operations in Washington.

The *Act of July 22, 1854,* 10 Stat. 308, established the office of Surveyor General in New Mexico and another for the territories of Kansas and Nebraska. It also granted Donation Land Claims, similar to the Oregon donations, to actual settlers in New Mexico. It isn't immediately known how many such claims were taken up in New Mexico which included what is now Arizona. In 1880, Donaldson reported 135 such claims, which were to be taken by legal subdivisions.

The Surveyor General of New Mexico was given double duty—he had to examine and determine the validity of private land claims under Spanish and Mexican grants. In effect, he was Land Commissioner as well as Surveyor General.

On August 5, 1854, William Pelham was notified of his appointment to be Surveyor General of New Mexico. He was a good choice because he had been Surveyor General of Arkansas from 1841 through 1849 and was experienced with the system and private land claims. Further instructions were sent on August 21, 1854; Pelham was to establish a meridian and baseline to govern the New Mexico Territory surveys. He was to fully acquaint himself with the Spanish laws and court decisions relating to them, and collect the documents on which the claims were based. It was a horrendous job that Pelham never fully accomplished, but he jumped in with both feet. He arrived in Santa Fe on December 28, 1854, and immediately opened his office; on his way he made a reconnaissance of the Rio Grande Valley. In his *1855 Annual Report,* Pelham said,

> "Agreeable to your instructions I selected a hill about six miles below the mouth of the Puerco River, which is two hundred feet high and of a rocky formation. This hill is nearly round, and is washed at its base by the Rio Grande. I have therefore established this hill as the initial point, and have caused a suitable monument to be erected on its summit."

On March 9, 1855, Pelham contracted with John W. Garretson for the survey of the New Mexico Principal Meridian and baseline. In April, Garretson actually erected the initial monument and began the surveys of the meridian from it; this meridian system controls all the surveys in New Mexico and southwestern Colorado. The New Mexico surveys were to be done in accordance with the Oregon Manual.

John Calhoun was appointed Surveyor General of Nebraska and Kansas. Wilson sent him instructions on August 26, 1854. The parallel of 40° north latitude was to be surveyed west from the Missouri River as a baseline of the Sixth Principal Meridian for a distance of 108 miles or, 18 townships, where the initial point of the Sixth Principal Meridian was to be established. A "durable" monument was to be established on the Missouri River as the southeast corner of T. 1 N., R. 18 E., Sixth Principal Meridian. From this baseline, the township boundaries were to be surveyed north and south in accordance with the Oregon Manual. Since 40° north latitude was the boundary between the two territories and later the State line, it was to be carefully surveyed and monumented.

Calhoun established his office in Fort Leavenworth, Kansas Territory, and on November 2, 1854, contracted with J. P. Johnston for the survey of the 108 miles of baseline. He contracted with Charles A. Manners for erecting the durable monument on the Missouri River and examination of Johnston's work. A castiron post was set 52.55 chains west of the river to keep it from washing away. Johnston's survey upon examination proved to be "grossly in error." In April 1855, Calhoun contracted with Manners for the resurvey or correction of the baseline, which Manners did in July of that year. However, because of sickness and the delay caused by the corrective survey, the initial point of the Sixth Principal Meridian was established 60 miles west of the river instead of 108 miles. Manners surveyed the meridian line north into Nebraska and other deputies went to work on the township lines in Kansas and Nebraska in August 1855. Work progressed rapidly in the open prairies of those territories, hampered only by the Indians.

The *Act of August 4, 1854,* 10 Stat. 575, added the Gadsden Purchase to the Territory of New Mexico and many more private land claims.

Surveyor General Gardner of Oregon complained in his annual report of the problems he was having with the Donation Land Claims (DLC), which were supposed to be taken as nearly as possible by legal subdivisions of sections. But in fact, the occupied claim lines laid in all directions, or if generally east and west, they didn't conform to the subdivision lines. Not very many settlers were coming in and filing their claims so Gardner didn't know where they were located. The township and section line surveys were being held up as a result. If Gardner surveyed the claims as staked on the ground, many small fractions would be left within a section.

As it turned out, the solution was quite simple. Gardner and his successors surveyed all of the township and section lines first without regard to the claims, but made notes of where the lines apparently entered and left an occupied

claim. Later, as the claims were actually filed and verified, the DLC boundaries were surveyed and tied to the existing rectangular surveys. The first claim surveyed in a township was designated No. 37, the second No. 38, and so on. When all claims in a township were surveyed, a DLC plat was made. The fractions remaining in a section were lotted with a lot number and area, which could then be sold by the land office. A separate set of field notes were made, called simply the "DLC Notes." It eventually worked out quite well; one interesting item, however, did occur. In 1859, Surveyor General William W. Chapman reported that he had surveyed a DLC which laid across a navigable river, the Umpqua, without meandering the river through it, and returned the portion within the river as part of the total area of the DLC. Thus, the bed of a navigable river was patented; it is presumed that this could pose an interesting legal problem of ownership, especially if accretion was involved.

The DLC plats in Oregon were basically on the same plan as the system used in Florida, except that the claims were not called sections. An 1849 Florida plat is shown in Fig. 40.

An Oregon DLC plat of T. 23 S., R. 7 W., Willamette Meridian, is shown in Fig. 41. Comparison of these plats readily reveal the similarities.

The *Appropriations Act of March 3, 1855,* 10 Stat. 643, provided funds for the Surveyor General and for surveys of Utah Territory. David H. Burr was appointed Surveyor General and established his office in Salt Lake City on July 27, 1855; he designated the southwest corner of the "Temple Block" as the initial point for the Salt Lake Meridian. The survey of the baseline and meridian was begun by Deputy Surveyor Frederick H. Burr in 1856. By the end of September, he had surveyed the baseline four miles east and 36 miles west and the meridian had been run 84 miles north and 72 miles south. Not much more was done before 1857.

The same appropriations act provided funds for the survey of the "Outlines of Indian Reservations" in Kansas and Nebraska. During the later part of 1855 and most of 1856, Calhoun had most of his deputies working on the exterior boundaries of Indian reservations so that he could avoid them in the regular rectangular work. In the ensuing years, more and more reservation boundaries were surveyed in Nebraska, Kansas, and Minnesota territories, but the responsibility was divided between Indian Affairs and the GLO for nearly ten more years.

The *1855 Manual of Surveying Instructions,* an expansion of the *Oregon Manual of 1851,* again prepared by John M. Moore, Principal Clerk of Surveys, was officially issued on February 22, 1855. It established the present system of baselines, principal meridians, spacing of standard parallels, and guide meridians.

Although technical details of monumentation, rectangular and closing limits, equipment, and the like have evolved since that time, the basic system of rectangular surveys has remained the same since this manual was issued. The 1855 Manual, Diagram B, shows the unusual numbering of lots bordering on the north and west boundaries of the township. Those we now call lots 1 and 2 are labeled No. 2, and those we now call lots 3 and 4, are also labeled No. 2. It is unknown why this method of designating those lots was used; it was a change from that used after 1832 and it continued until 1866. Fig. 42 is a copy of Diagram B, from the 1855 Manual.

The 1855 Manual by inference indicates that only navigable streams were to be meandered on both banks. Perhaps only one bank of a non-navigable river was to be meandered; only the field notes of a particular township surveyed during the period would reveal the true policy adopted. This manual does indicate that a true line across meandered streams was only surveyed on township boundaries and meridional section lines. On latitudinal lines (east-west section lines) the line was run west from a section corner to the meandered stream and east from the section corner (a mile to the west), to the meandered stream and meander corners established, with a tie made across the stream. This practice almost invariably created a kink in the section line crossing the stream. For other details, the Manual should be consulted, including the specimen field notes.

Thomas A. Hendricks was appointed Commissioner of the GLO on August 8, 1855; he was the first commissioner who apparently had no background or qualifications for the job. He was born near Zanesville, Ohio, on September 7, 1819, and graduated from South Hanover College, Indiana in 1841. He was elected successively to both houses of the Indiana Legislature and to the U.S. House of Representatives in 1851. Hendricks was a politician of the Democratic Party with no real background in surveying and the land laws. He later became a U.S. Senator, Governor of Indiana, and ran for President in 1868, 1876, 1880, and 1884, when he was elected Vice President and died in 1885. Some of the rulings and letters during Hendrick's tenure were not always correct.

On February 6, 1856, Hendricks replied to Leander Chapman at Detroit regarding the proper method of restoring the lost quarter corners on the east and west boundaries of section 4, T. 34 N., R. 10 E., Second Principal Meridian, Indiana. The original survey had returned the east line as 79.96 chains and the west line as 79.90 chains. The County Surveyor had found those lines to measure 72.84 chains and 73.71 chains respectively, between found section corners. The local Circuit Court had ruled that because the 1800 law said the excess or deficiency was to be placed in the last half mile going into the north and west boundaries, the quarter corners should be restored exactly 40 chains north of the southeast and southwest corners of Section 4. That, of course, put all the error in the last or north half mile. Chapman and the County Surveyor disagreed with the decision by the court and asked Hendricks' opinion. He replied that the *Act of February 11, 1805,* controlled because the lengths of the lines returned on the plat were by law the true length, and therefore the lost quarter corners should be restored by single proportionate measure. This would place the east quarter corner at 36.44 chains north and the west quarter corner at 36.90 chains north of the section corners.

This letter is included here to illustrate the type of questions or problems which began flooding the Commissioner's office after the suspension of resurveys in 1853. It also illustrates the gross misunderstanding of the various surveying laws by many surveyors and even the courts. There were no rules for restoring lost corners by Congress; they had to be developed as they had been in part by the Commissioner and the courts. The Commissioner rendered these rulings without any legal authority to do so; they could only be opinions unless public lands were involved. However, the reader should always keep in mind that the Commissioner was a

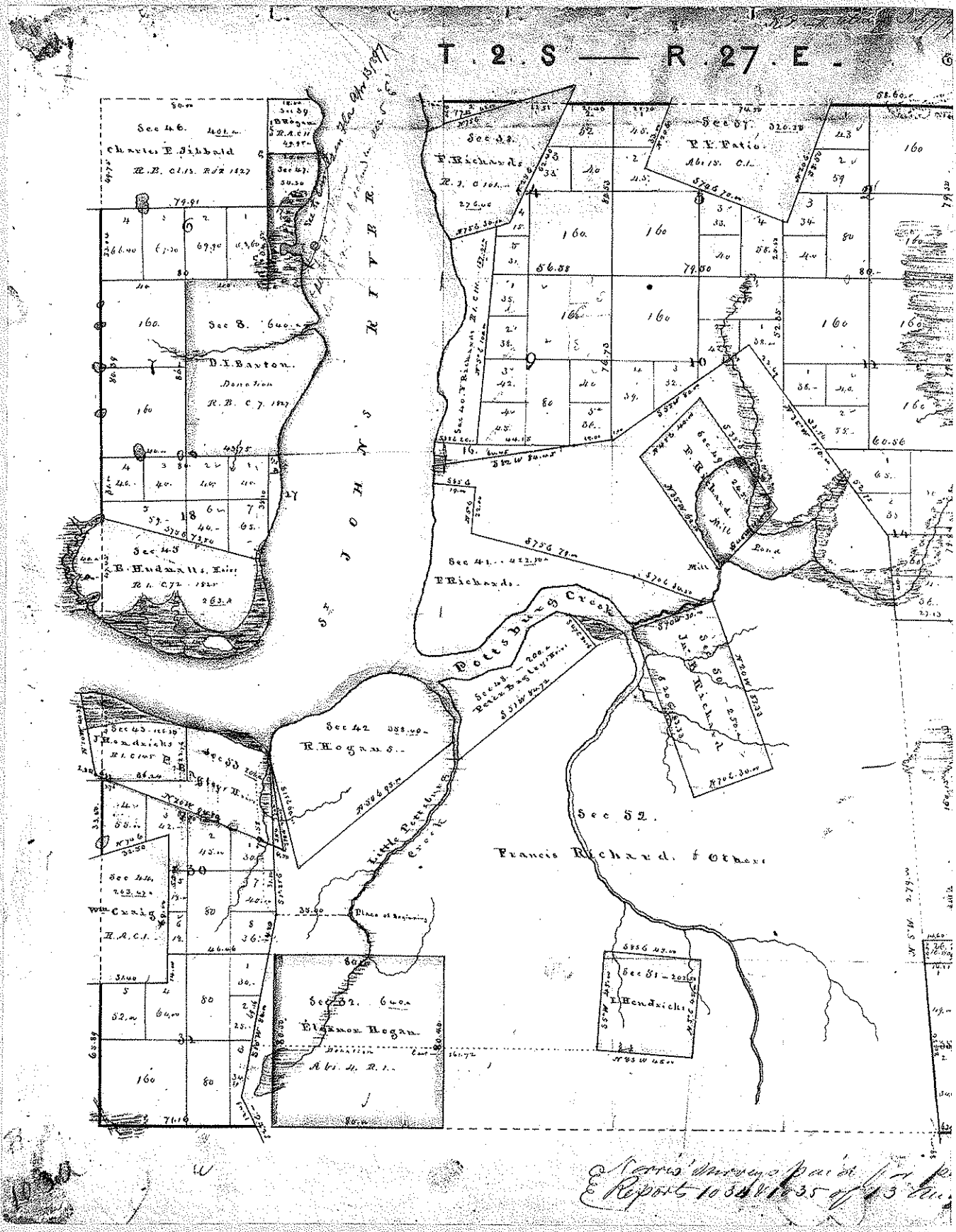
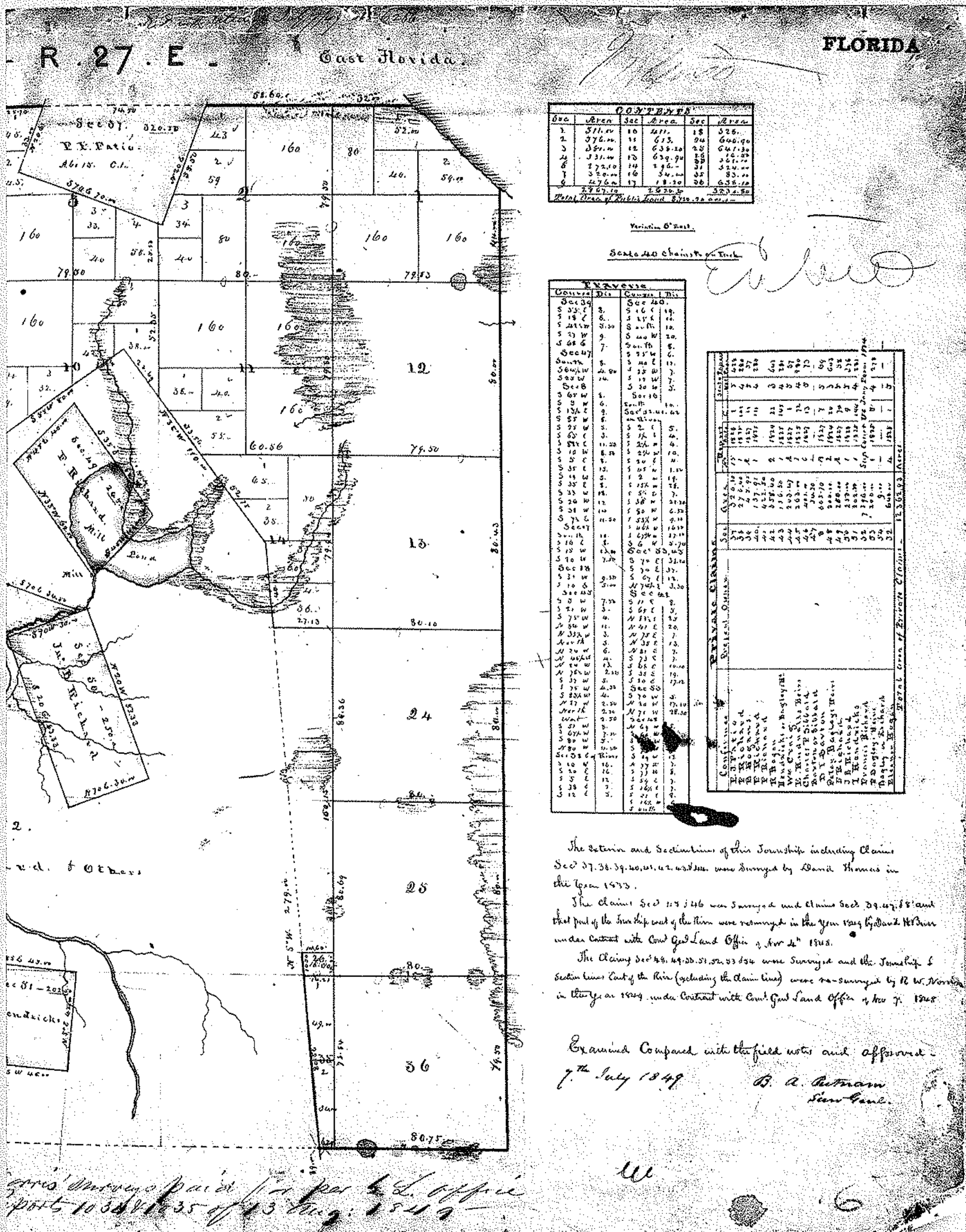


Figure 40. Florida Township with Private Claims and Mixed Section Numbers.



R. 27. E.
East Florida.
FLORIDA
Contents
Variation 0° East.
Traverse
Private Claims
Mill
Pond
The exterior and Section lines of this Township including Claims Sec. 37. 38. 39. 40. 41. 42. 43 & 44 were Surveyed by David Thomas in the Year 1833.
The Claims Sec. 45 & 46 were Surveyed and Claims Secs. 39. 47 & 48 and that part of the Township west of the River were resurveyed in the Year 1849 by David H. Burr under Contract with Com. Genl Land Office of Nov 4th 1848.
The Claims Sec. 48. 49. 50. 51. 52. 53 & 54 were Surveyed and the Township & Section lines East of the River (excluding the Claim lines) were re-surveyed by R. W. Norris in the Year 1849 under Contract with Com. Genl Land Office of Nov 7. 1848
Examined Compared with the field notes and approved.
7th July 1849
B. A. Putnam
Surv Genl.

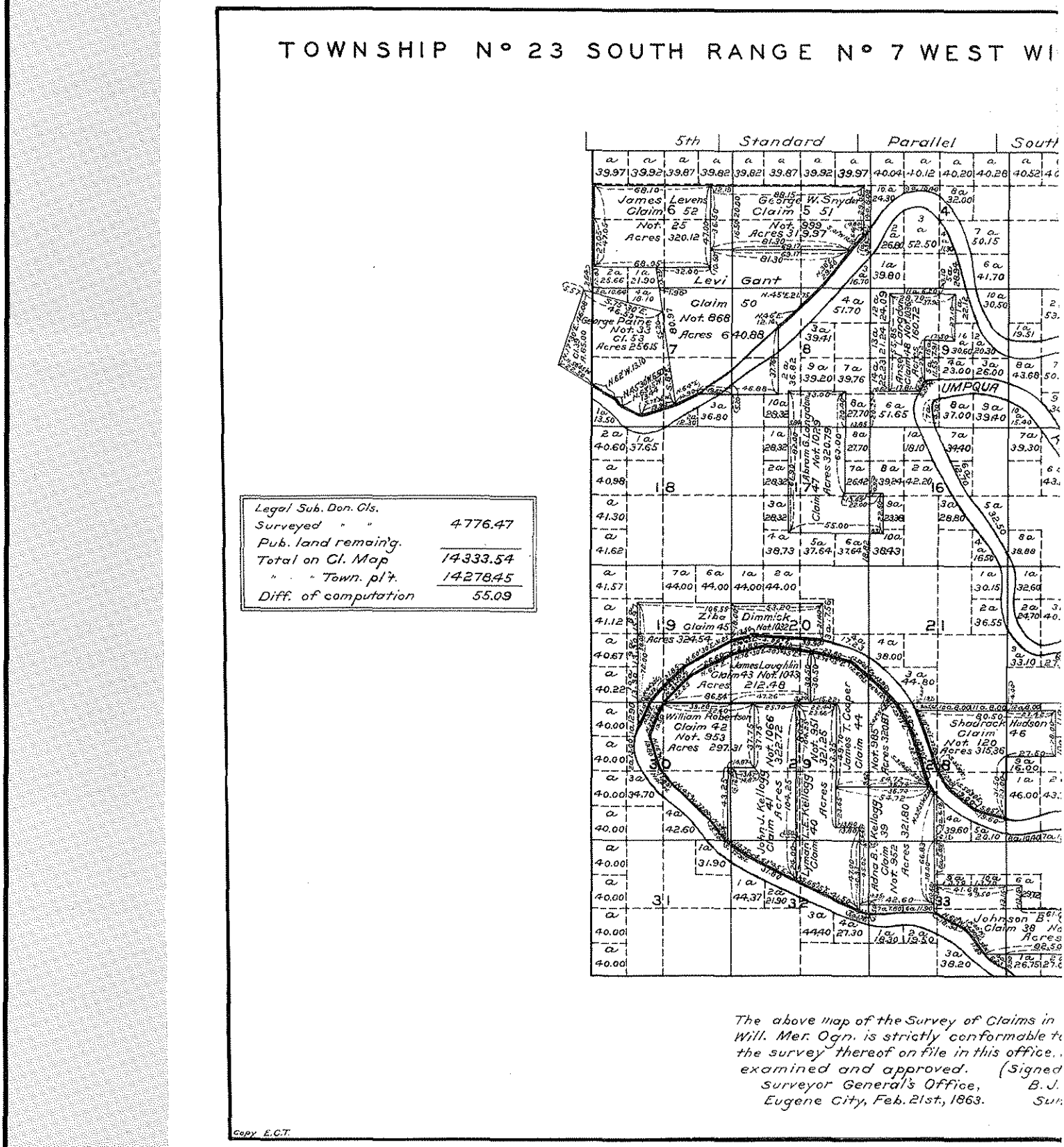
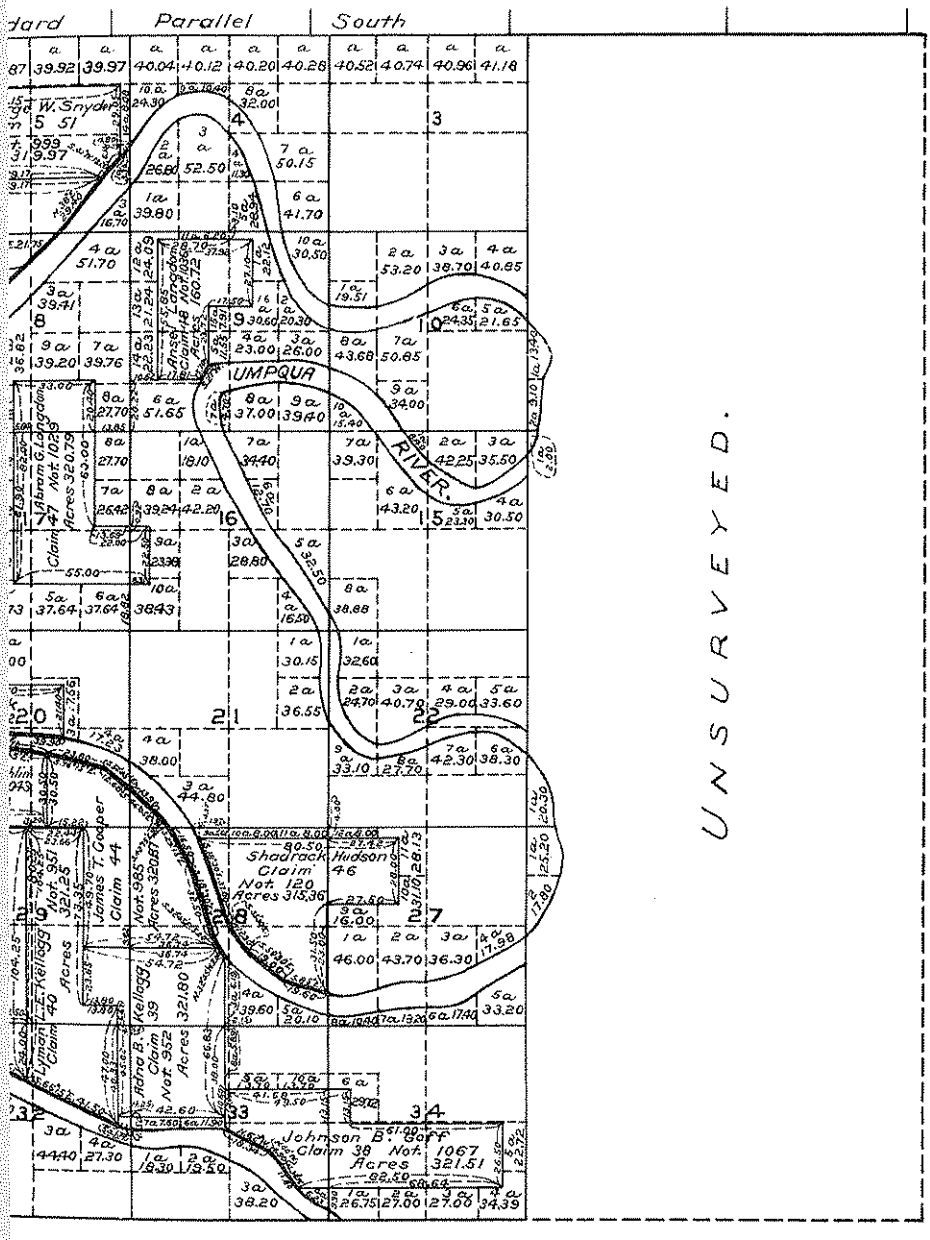


Figure 41. D.L.C. Plat T.23S., R.7W., Willamette Meridian.

E Nº 7 WEST WILLAMETTE MERIDIAN OREGON



bove map of the Survey of Claims in Town. 23 S. R. 7 W. Wer. Ogn. is strictly conformable to the field notes of urvey thereof on file in this office, which have been ained and approved. (Signed)
rveyor General's Office, B. J. Pengra
gene City, Feb. 21st, 1863. Sur. Gen. of Ogn.

Public Survey Office,
Portland, Oregon, Jan. 9, 1930.
I certify the above to be a correct copy of the original plat on file in this office
Joseph A. Gauong
Office Cadastral Engineer

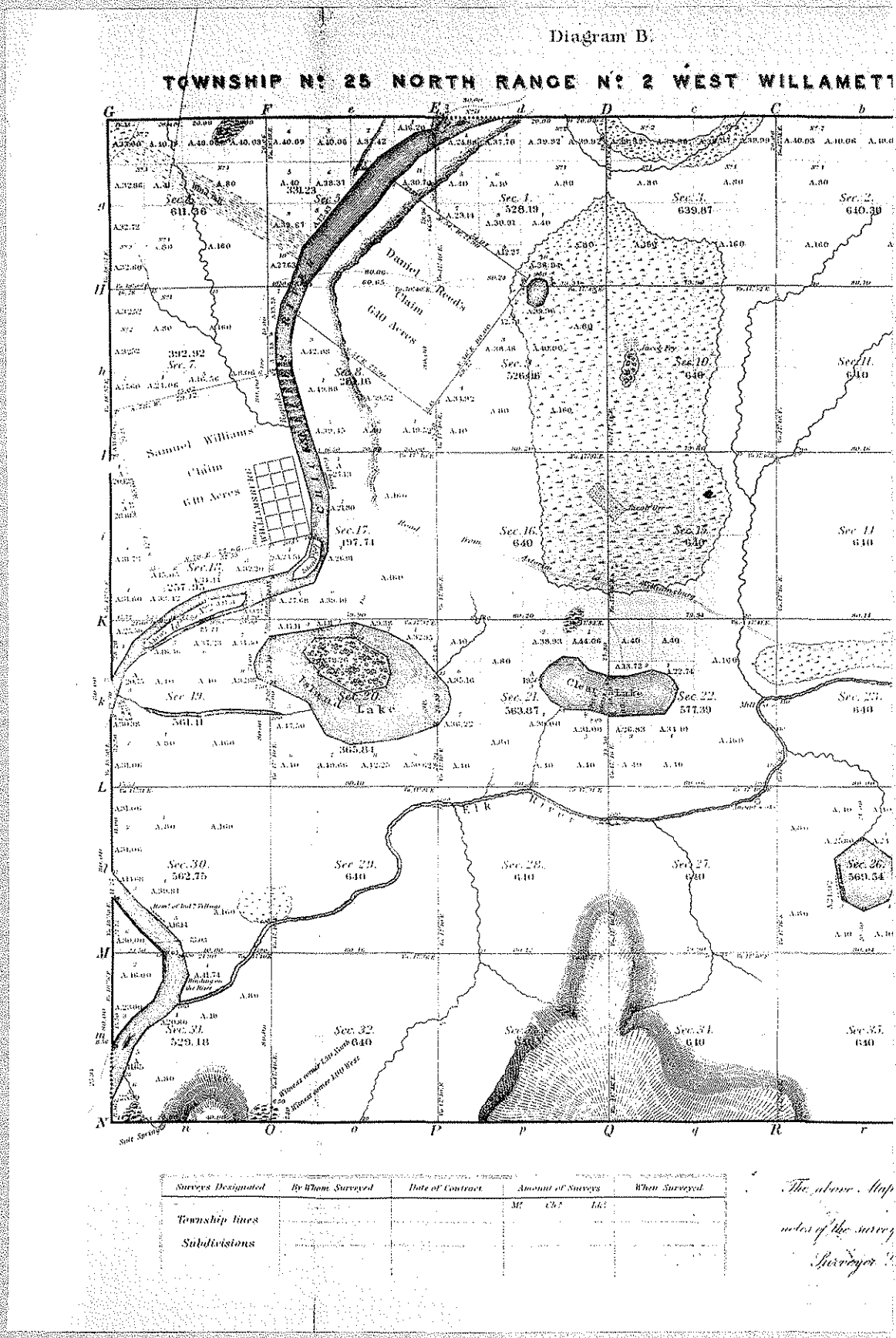
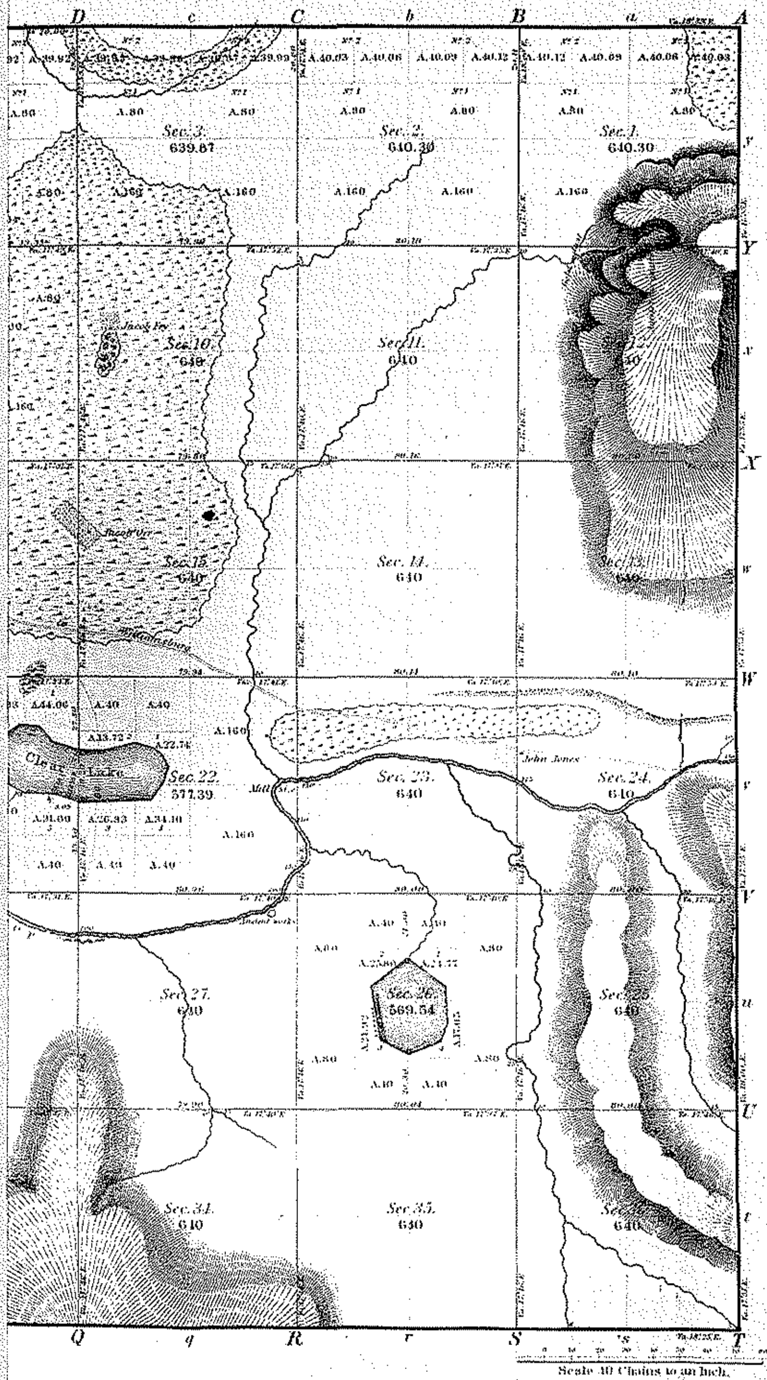


Figure 42. Diagram "B" from 1855 Manual.

Diagram B.

ᴅE Nº 2 WEST WILLAMETTE MERIDIAN.



Aggregate Area of Public lands	20598.26
Private Surveys	1280.00
Total number of Acres	21878.26
Estimated Area of river and lakes	951.98
Aggregate	22830.24

of Surveys	When Surveyed.
17 1.12	

The above Map of Township Nº of Range Nº Meridian is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved

Surveyor Generals Office at } 187

Surv. Gen.l

J. McClelland Sc. Wash. D.C.

very busy man with many activities under his supervision. The opinions written were probably written by the Principal Clerk of Surveys; unless litigation was pending, they were probably signed by the Commissioner without careful analysis.

In the spring of 1856, John Loughborough, Surveyor General of Illinois and Missouri, prepared his *Instructions to Deputy Surveyors*. He sent a draft of these instructions to Hendricks for approval and requested permission to have them printed. Hendricks approved and requested Loughborough to send him 200 copies when they came off the press, which Loughborough did later in the year. These Instructions were basically in agreement with the 1855 official Manual, but in conflict in the limits of closure for a township (Manual, 3½ chains; Instructions, 5 chains). Also, the Manual required lines into the north and west boundaries to be run random and true with closing corners only on standard parallels. The Instructions called for closing (double) corners against the north and west boundaries, which was the "old practice" before 1846. Much more importantly, however, was the appendix to Loughborough's Instructions, pages 47 through 64, which outlined an opinion on the proper method of restoring lost corners and subdividing sections. Basically, section corners are to be restored by single proportion between found corners to the north and south of the missing corners, but there is some hedging and, depending upon interpretation, suggests a double proportion under certain circumstances. Under Item [23] on page 55, the following statement is made, "None of the Acts of Congress, in relation to the Public Lands, make any special provision in respect to the manner in which the subdivisions of Sections should be made by Deputy Surveyors." This seems incredible in view of the fact that all Surveyors General were supplied with copies of the acts of Congress, including the *Act of February 11, 1805,* and the *Act of April 5, 1832,* which most certainly states how sections are to be subdivided. These Instructions should be studied in their entirety to fully understand what the suggested methods of subdividing sections were. The most controversial was that the center quarter-section corner should be established at midpoint on the east-west centerline and the center of the quarter sections (NE 1/16) should be established in the same manner.

After receiving the 200 copies of Loughborough's Instructions, Hendricks began immediately to send a copy to County Surveyors who generally inquired about how to subdivide sections; he referred them to pages 47-62 of the Instructions. This policy continued until about 1863 when the supply of the 1856 Instructions became exhausted. The policy of restoring lost section corners primarily by single proportion between found corners to the north and south was continued until 1882. The argument for the method was usually given about as follows: It is well known that the meridional section lines are actually run in the field, due north, with quarter and section corners established at 40 and 80 chains. These lines are always run. It is also well known that most deputies do not run the east-west section lines all the way, instead they stub out from a section corner just 40 chains and set the quarter corners on the east-west lines, but return field notes with the quarter corner as being at midpoint and on a true line. Therefore, a quarter corner to the east or west would not be a proper basis for restoring a lost section corner in its original position. The same basic argument was used for establishing the center quarter corner at midpoint on the east-west centerline and connecting the north and south centerlines therefrom to the original quarter corners on the north and south sides of the section. The method outlined was believed to make a more equitable division of the section into quarter sections, and on down into one-sixteenth sections.

Looking at the subject from a point of equity, the argument has some understandable merit, but to scholars of the law, as enacted by Congress, the method of subdividing sections was erroneous. It was this whole argument that prompted the now famous letter of opinion written by Abraham Lincoln on January 6, 1859, in which he said the center quarter corner should be placed at the intersection of straight centerlines connecting the original quarter-section corners.

On January 6, 1857, Loughborough was instructed to prepare the Illinois and Missouri records for transmittal to the State authorities and close the St. Louis office by June 30, 1857. The surveys in those States were still not complete and no State legislation had been passed for acceptance of the records. The order was not implemented.

The *Legislative, Executive, and Judicial Appropriations Act of March 3, 1857,* 11 Stat. 206, under "Surveyors General and their Clerks." directs the Secretary of the Interior to cause the "Surveyor General northwest of the Ohio" (at Detroit, Michigan) to be moved to St. Paul, Minnesota. On March 27, 1857, Charles L. Emerson was notified of his appointment to be Surveyor General of Minnesota at Detroit; he actually replaced Chapman on April 12, 1857, and closed the Detroit office on May 11. He opened the Minnesota office in St. Paul on May 23, 1857 and he transferred most of the Michigan records to the State at that time. After bringing all arrears up to snuff, he completed transfer of the Michigan records in May 1858. He received the Minnesota survey records from Lewis in Dubuque and continued the Minnesota surveys without any particular trouble.

In July 1857, David H. Burr, Surveyor General of Utah, was run out of Salt Lake City by militant Mormans. John C. Hays from California was appointed to officially fill the vacant post but apparently never went to Utah. Burr eventually sent his son to Salt Lake City, who turned over the Utah records to the Territorial Governor on April 5, 1858. The Utah office remained vacant until September 29, 1859, when Samuel C. Stambaugh took over the post; but he quit in 1861 and for all practical purposes, no rectangular surveys were made in Utah until 1869.

The *1857 Annual Report* indicated that some 17,000 miles of survey lines had been run in Kansas and 7,000 miles in Nebraska, which is indicative of the speed in which those plains were being surveyed.

On May 25, 1857, Hendricks gave approval and instructions to William J. McCulloh, Surveyor General of Louisiana, for the survey of dried-up "Spanish Lake" in townships 9 and 10 north, range 9 west, Louisiana Meridian. The lake had been meandered during the original survey but had dried up due to drainage, and the plat was approved October 27, 1857. This is the first of the dried-up lake surveys that were discovered.

The Commissioner considered all non-navigable lakes to be public land subject to survey and disposal the same as any other unsurveyed public land. Prior to 1825, only the very

large lakes were meandered; after 1825, lakes of 40 acres and upward in size were meandered, and these only, because settlers didn't want to pay for land they couldn't farm. So the lakes were meandered and left unsold, but were still public land subject to survey and disposal when and if they dried up, or if the government chose to survey and sell them. Surveying a body of water wasn't very practical until after it dried up, for whatever reason. The States tried to claim lakes under the *Swamp Lands Act,* but the claims were rejected because they weren't "swamp land," nor "overflowed," under the meaning of those acts. The position was that shallow lakes, ponds, and marshes were to be surveyed whenever the Commissioner chose to approve a survey, because they were not navigable and were not streams as defined by Sec. 9 of the *Act of May 18, 1796.* Therefore, the abutting owners could not own them in common to the center of the stream. Since the government had merely meandered them to segregate them from lands being sold, the adjoiners could not and did not have any riparian rights.

In retrospect, knowing the basis of the elimination of these small lakes from land sales, the argument was valid. Ironically, the 1851 and 1855 Manuals had lowered the size of lakes to be meandered to 25 acres, but then cautioned that "shallow ponds, readily to be drained, or likely to dry up, are not to be meandered." Perhaps John Moore harbored doubts about the validity of the contention that dried-up meandered lakes would remain public land. The survey of some of the more important dried-up lakes will be mentioned herein as they occurred. With very few exceptions, only lakes that were completely dried up were surveyed.

Minnesota was admitted to the Union on *May 11, 1858,* 11 Stat. 285, with its present boundaries.

The *Acts of May 18, 1858,* 11 Stat. 289-290, pertain to California. The first act makes authenticated copies of the Surveyor General's records admissable as evidence in a court of law. The second act makes it a crime to falsify documents to establish land claims, which was precipitated by persons faking papers and documents in attempts to enlarge or establish claims under Spanish or Mexican laws.

The *Act of May 29, 1858,* 11 Stat. 293, extended the public land laws and surveys to the lands east of the Cascade Mountains in Washington and Oregon territories. In late 1858, David P. Thompson, Deputy Surveyor, extended the Willamette Baseline across the mountains to the southeast corner of T. 1 N., R. 32 E., and ran the Columbia Guide Meridian north for 25 miles. The large area east of the Cascades was finally being opened for survey and settlement.

The *1858 Annual Report* indicates that 20,000 miles had been surveyed during the year in Kansas-Nebraska, the solar compass was being used on all surveys in New Mexico, and all land offices had been ordered to police the public timber lands and stop the stealing of timber, especially pine, from the public domain. Timber thefts were particularly great in Wisconsin, Minnesota, and parts of Florida.

On July 23, 1858, Hendricks issued *Special Instructions* to a County Surveyor in Michigan for the survey of some islands in Thunder Bay. The letter contains the following statement:

> "I would inform you in reply, that upon the terms proposed you can proceed to survey those islands and for your guidance in the work I herewith enclose a copy of the Instructions that were issued some years ago to the United States Deputy Surveyors in the District of Illinois and Missouri and which instructions are applicable to all of the other Surveying Districts."

The Instructions referred to are those by Loughborough in 1856. The 1855 Manual contained some instructions and field note examples for the survey of islands. The 1856 Instructions, page 33 [85] and [86], are better written and easier to understand concerning island surveys, but the letter does not mention the 1855 Manual and implies that the 1856 Instructions are applicable in full to all surveying districts. Perhaps it was meant to be only so in relation to island surveys. Incidentally, the authority for this survey was revoked because the County Surveyor wanted half interest ownership of the islands from the applicants in payment for doing the survey. The Commissioner considered such arrangements illegal.

On August 12, 1858, Hendricks wrote to a man in Ohio who reported a hiatus, 40 to 50 rods wide, between T. 10 N., Rs. 1 and 2 E., Michigan Meridian, and wanted the strip surveyed so he could buy it. The man reported two separate and distinct range lines. Hendricks refused the request on the grounds that the original survey plats did not show any unsurveyed strip; therefore there was none.

On February 7, 1859, Surveyor General Henry M. Rector in Little Rock, Arkansas, resigned. The Little Rock office was closed on March 12, 1859, and the records were turned over to the Register and Receiver of the Land Office for safekeeping. In 1876, many of the Arkansas records were in the Washington office being properly filed and organized; the remainder were in Little Rock. Donaldson reported that the Register turned over the Arkansas records to the State in 1861 during the Civil War.

Oregon was admitted to the Union on *February 14, 1859,* 11 Stat. 383, with its present boundaries.

In August 1859, the west boundary of Minnesota was surveyed south from Big Stone Lake by Chauncey Snow and Henry Hutton to the Iowa line, under contract with the Commissioner. Iron posts were used in places on that boundary.

In 1859, the parallel of 43° 30′ latitude, the south boundary of Minnesota, was extended west into the Dakota Territory, under contract with the Surveyor General of Wisconsin and Iowa, and township boundaries north of that line were surveyed, which began the surveys in a virgin area.

On October 18, 1859, Samuel A. Smith, a politician, became Commissioner of the GLO, replacing Hendricks. In the *1859 Annual Report,* Smith discussed the proposed Homestead Law being debated in Congress. Rumors of this law, which Smith opposed, were greatly reducing land sales.

On February 23, 1860, Joseph S. Wilson, who had been Chief Clerk in the GLO until his appointment, replaced Smith as Commissioner of the GLO.

The *Swamp Lands Act* was extended to the states of Minnesota and Oregon by the *Act of March 12, 1860,* 12 Stat. 3. None of the states admitted after this date are "swamp land states."

On October 27, 1860, Wilson wrote the following letter in regard to dried-up lakes:

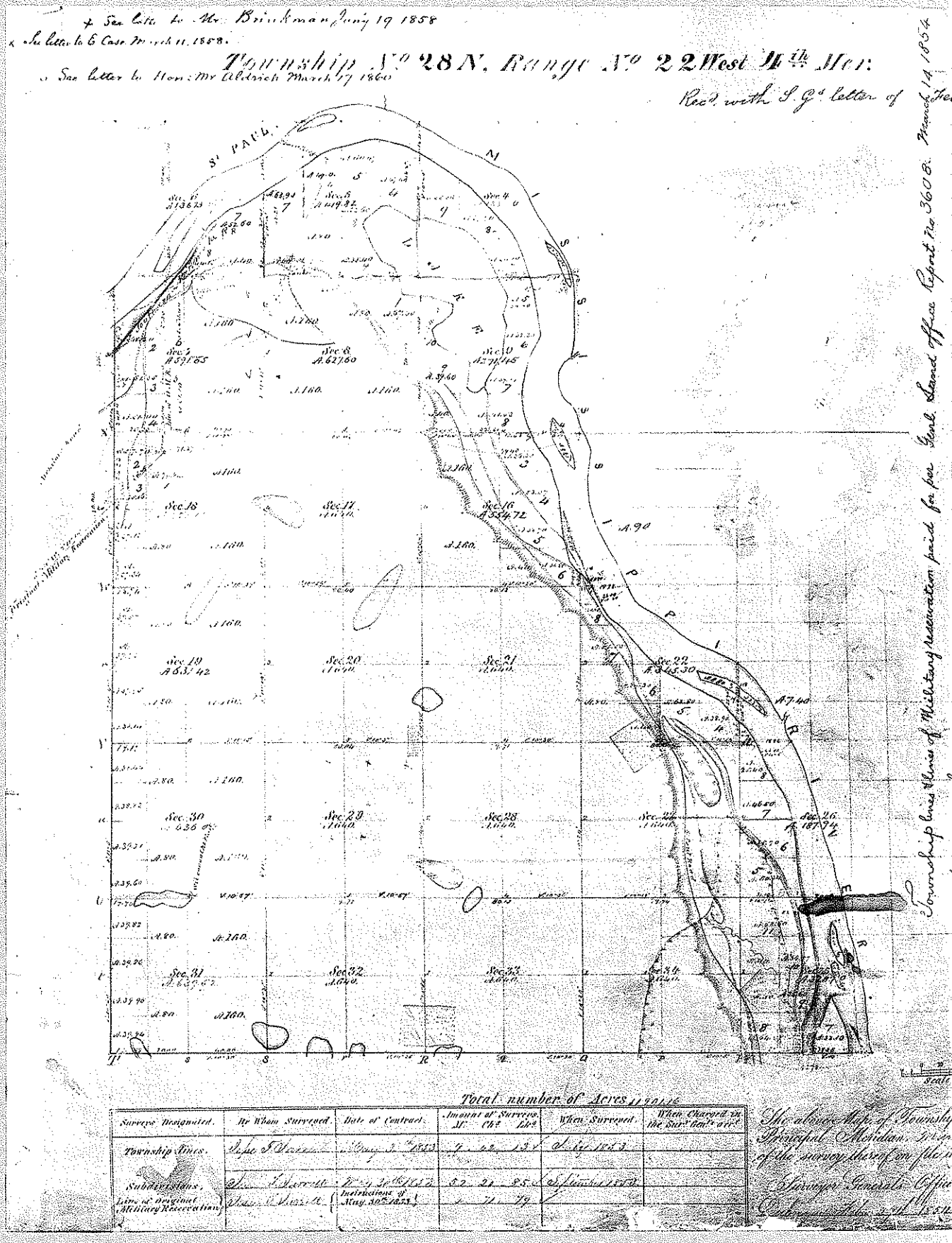
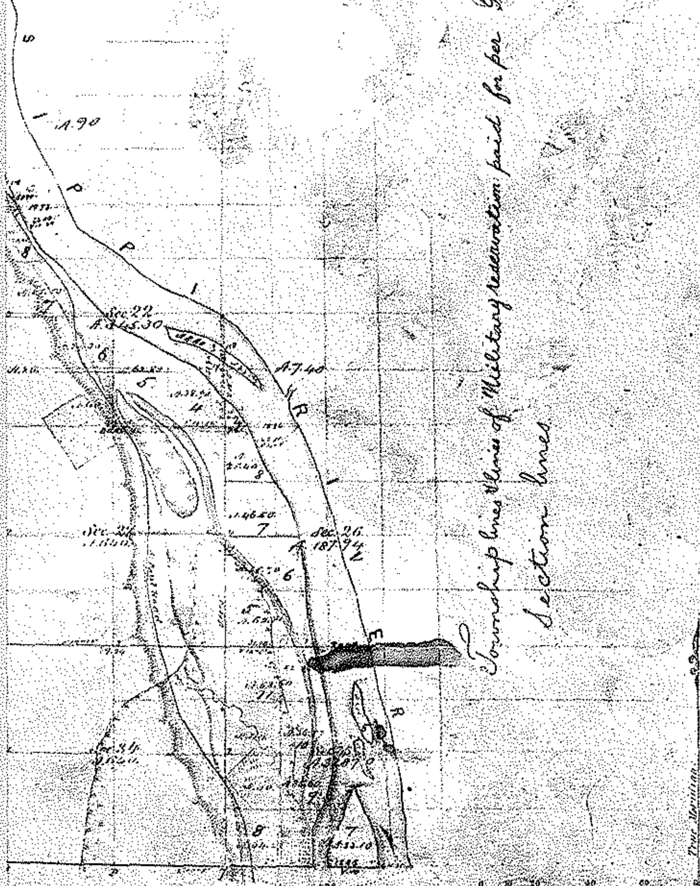


Figure 43. T.28N., R.22W., Fourth Principal Meridian, Minnesota.Plat Approved February 24, 1854.

… No. 22 West 4th Mer.

Recd. with S. Gs. letter of Feby 27th 1854
H. M.



MINNESOTA

Meanders of Mississippi River, Islands & Lake.

Posts	Courses	Chs. Lks.
Mississippi River Right Bank up Stream		
1	N. 6° W.	11.00
	N. 23½ E.	17.50
	N. 11½° E.	12.50
	N. 3° W.	12.00
	N. 9° W.	6.00
	N. 14°30' W.	10.00
	N. 6° W.	6.50
2	N. 16° W.	6.55
	N. 11° W.	12.50
	N. 4° W.	20.00
	N. 12° W.	20.00
	N. 32° W.	19.00
	N. 21½ W.	10.00
3	N. 33° W.	3.55
	N. 33° W.	6.00
4	N. 44° W.	6.44
	N. 41° W.	15.00
	N. 62½° W.	33.00
	N. 41° W.	12.00
	N. 56½° W.	7.00
5	N. 32° W.	17.80
	N. 23°30' W.	2.00
6	N. 45°30' W.	3.73
	N. 41° W.	9.00
	N. 20½ W.	14.50
	N. 6° E.	7.00
	N. 7° W.	14.00
	N. 19° W.	21.00
	N. 33½ W.	10.00
	N. 27° W.	11.00
7	N. 6½° W.	3.10
	N. 16½ W.	17.00
	N. 3° E.	7.50
	N. 15° E.	11.00
	N. 20½ E.	8.50
	N. 15° E.	5.00
	N. 5° W.	3.50
8	N. 10½ W.	26.50
	N. 21½ W.	8.50
	N. 24° W.	8.00
	N. 27°30' W.	6.50
	N. 36° W.	12.00
	N. 41° W.	16.00
	N. 47° W.	14.00
	N. 53° W.	11.00
9	N. 60½ W.	6.78
	N. 61° W.	11.50
	N. 73½ W.	10.00
	N. 84° W.	11.00
	S. 80° W.	6.00
	S. 75° W.	8.00
	S. 67½ W.	7.50
	S. 53° W.	25.00
10	S. 58° W.	10.30
	S. 59° W.	17.00
	S. 82°30' W.	5.50

Posts	Courses	Chs. Lks.
	S. 50° W.	15.00
	S. 29° W.	12.50
	S. 36½ W.	16.50
11	S. 55° W.	4.00
	S. 44° W.	10.00
12	S. 51° W.	27.55
Island in Mississippi River in Sections 4 & 9.		
13	N. 22° W.	12.50
	N. 45° W.	4.00
	N. 24° W.	6.00
	S. 55° E.	6.00
	S. 35° E.	7.00
	S. 22° E.	8.00
14	S. 8° E.	3.50
	South	3.50
	West	1.50
13	N. 27° W.	11.00
Island on line of Secs. 9 & 16 in Miss. River		
15	N. 5° W.	5.50
	N. 24° E.	2.20
	S. 45° E.	3.00
16	S. 29½° E.	7.10
	S. 27° E.	6.50
	S. 16° E.	6.50
	S. 6° E.	7.00
	S. 43°30' W.	10.00
	N. 22° W.	5.00
15	N. 24½ W.	8.00
Island in Section 16		
17	N. 15½ W.	12.00
	N. 25° W.	5.50
	N. 15½ W.	16.50
	S. 6° E.	17.50
	S. 27° E.	5.00
	S. 23½° E.	7.50
17	S. 34° E.	4.92
Island in Sections 22 & 25		
18	N. 45° W.	4.00
	N. 66½ W.	4.50
	N. 72° W.	15.70
	S. 21½ E.	3.50
	S. 53° E.	3.50
	S. 72° E.	6.50
19	S. 63° E.	12.86
	S. 53° E.	15.00
	N. 28° W.	3.50
	N. 37° W.	5.00
18	N. 54° W.	9.04
Island in Section 35.		
20	S. 15° W.	2.50
	South	6.50
	S. 23½ E.	10.50

Posts	Courses	Chs. Lks.
	S. 48° E.	11.00
	N. 18½° E.	2.00
	N. 11° W.	5.50
	N. 23½ W.	3.00
	N. 14°30' W.	9.50
20	N. 42°30' W.	3.95
Island in section 35.		
21	S. 69° W.	1.30
	S. 67½ E.	[illegible]
	S. 17° E.	[illegible]
	S. 55° E.	[illegible]
	N. 17½ W.	[illegible]
	North	[illegible]
	N. 17° W.	[illegible]
21	N. 50½ W.	[illegible]
Island on Township line between Sections [illegible]		
22	North	[illegible]
	N. 17° W.	[illegible]
	N. 23½ W.	12.50
	S. 40° W.	3.50
	S. 20° W.	4.00
	S. 26° W.	[illegible]
	S. 44½ W.	9.00
23	S. 7½ E.	10.50
Lake in Sections [illegible]		
24	N. 30° W.	7.50
	N. 22½ W.	5.50
	N. 27° W.	21.00
	N. 12° E.	4.00
	N. 55° E.	10.00
	N. 57½ E.	5.50
	S. 58½ E.	11.00
25	S. 79° E.	6.50
	S. 71½ E.	13.00
	S. 78° E.	5.50
	S. 54° E.	10.00
	S. 33° E.	12.00
26	S. 23½ E.	10.50
	S. 23° E.	10.50
	S. 9° W.	11.00
	S. 20° E.	3.00
	S. 8° W.	13.50
	S. 34½ W.	11.50
	S. 36° W.	4.00
	S. 13° W.	6.00
	S. 70° W.	5.00
	N. 62½ W.	5.00
	N. 10° E.	14.00
	N. 65° W.	18.00
	N. 30° W.	18.00
	N. 52° E.	13.00
	North	4.50
27	N. 75° W.	13.45
	N. 65° W.	12.00
24	N. 10° W.	9.10

	Ms.	Chs.	Lks.
Total	7	75	97

Acres 11901.16

Surveyed.	When Charged in the Surr. Genl's acct.
1853	
1853	

The above Map of Township No. 28 North of Range No. 22 West of the 4th Principal Meridian Minnesota is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved.

Surveyor General's Office
Dubuque Feby 27th 1854

[illegible] Sur. Genl.

POOR COPY

A. C. Root, Esq.
Lyons, Iowa
Sir:

I have to acknowledge the receipt of yours of Oct. 22nd in which you state that a small Lake in Township 83 North, of Range five East, at the time of the Government Survey has since been drained owing to ditches made by the adjoining land owners (yourself being one) and that being desirous to enter it you apply to this office for instructions how to proceed in order to do so.

In reply I have to state, that whenever one or more persons living adjacent to a lake or pond, which by nature or other causes, such as evaporation, etc. becomes dry, wish to purchase the whole or any part of it, and with that view, desire it to be surveyed, he or they must file an application in writing, accompanied by an affidavit of at least two respectable persons, that they have made a personal inspection of the premises, and setting forth the facts of the disappearance of the water and the arable character of the land, and that the applicant has given notice to the coterminous proprietors, of his proposed application to the Surveyor General for the extension of the lines of the Public Surveys.

At any time after two months from the filing of said application, should no objection be made, the Surveyor General may extend the lines over the tract in question, and this Office will authorize the Register and Receiver to open the lands to sale or location.

No Survey however can be ordered, unless the water has *wholly* and *permanently disappeared.*

Very Respectfully
Your Ob't Servant
Jos. S. Wilson
Commissioner

This letter is nearly identical to following letters of the period concerning the survey of dried-up lakes. Some letters pointed out that a survey did not give the applicant any special rights and that the land temporarily enured to the benefit of abutting owners until the lake was totally and permanently dried up. In the closed States, application was made directly to the Commissioner who would then contract for the survey, if it had been approved.

The survey of the lake in T. 83 N., R. 5 E., was apparently not made until many years later. An 1879 letter listed the plat of it as having been approved March 21, 1876.

On December 19, 1860, Wilson authorized Emerson in St. Paul to have surveyed a drained and dried-up lake in sections 4, 5, 8, and 9, T. 28 N., R. 22 W., Fourth Principal Meridian, Minnesota. The lake was meandered in the original survey of 1853. The survey was made by C. W. Iddings, Deputy Surveyor, and the plat approved by Emerson on January 4, 1861. These plats are shown in Figs. 43 and 44. The land in the former lake is now part of an airport in South St. Paul, Minnesota.

The *1860 Annual Report* indicated that most of the surveys in Iowa were completed and that the surveys in Dakota were progressing rapidly, but with no land office, sales could not be made. Wilson also reported that many unauthorized and illegal surveys were being made in Carson Valley, Nevada by "County Surveyors." In 1860, Nevada was still not actually organized into a surveying district and many miners took it on themselves to have the land surveyed.

Kansas was admitted to the Union on *January 29, 1861,* 12 Stat. 126, with its present boundaries.

The preliminaries to the Civil War were felt in February 1861. South Carolina had seceded from the Union on December 20, 1860; this action was followed in January by the secession of the other Southern States including Florida and Louisiana.

On February 6, 1861, the Surveyor General of Louisiana, William J. McCulloh, notified Wilson that he had resigned his position and had turned over the Louisiana records to State authorities.

On February 10, 1861, Francis L. Dancy, Surveyor General of Florida, sent similar notification. The "bond book" lists Dancy as officially resigning on March 4, 1861. However, in April, he actually approved a survey that had been made in April. After the war, the deputy tried to collect on the contract without any luck. The survey was also never honored and was done over in the 1870's.

The Civil War started on April 12, 1861, and ended April 9, 1865. The surveys suffered due to reduced appropriations and consolidation of offices but did proceed at a slower pace.

The *Act of February 28, 1861,* 12 Stat. 172, organized the Territory of Colorado, with the same boundaries as that State now has. Colorado Territory was created out of lands that had been in the territories of Utah, New Mexico, Kansas, and Nebraska. The act established the office of Surveyor General for the new territory, and Francis M. Case, appointed the first Surveyor General of Colorado on April 5, 1861, established his office in Denver on June 17, 1861. The baseline of the Sixth Principal Meridian had been extended along the 40th parallel to the summit of the Rocky Mountains under the Surveyor General of Kansas and Nebraska, Ward B. Burnett, in 1859, so Case had only to contract for expansion of the existing rectangular system.

The *Act of March 2, 1861,* 12 Stat. 209, created both the Territory of Nevada and the office of Surveyor General. Nevada consisted of lands taken from Utah. John W. North was appointed Surveyor General on March 28, 1861, and established his office at Carson City on June 22, 1861. North contracted with Butler Ives for the extension of the Mount Diablo Meridian into Nevada from California. Ives ran the second, third and fourth standard parallels into Nevada and executed other rectangular surveys around the Carson Valley area in 1861. No new meridian and baseline was created. All of Nevada is on the Mount Diablo system.

Also on *March 2, 1861,* 12 Stat. 239, the Dakota Territory and the office of Surveyor General were created; the Dakota Territory included all the Nebraska Territory between Minnesota and the Rocky Mountains and between 43° and 49° north latitude. George D. Hill was appointed the first Surveyor General of Dakota Territory and he took office on June 27, 1861. He established his office at Yankton, South Dakota, on July 1, 1861. No new meridians or baselines were established at the time. The south boundary of Minnesota was extended west as a Standard Parallel of the Fifth Principal Meridian and used as an auxiliary baseline for extending the surveys in the Dakotas.

On March 19, 1861, James M. Edmunds replaced Wilson as

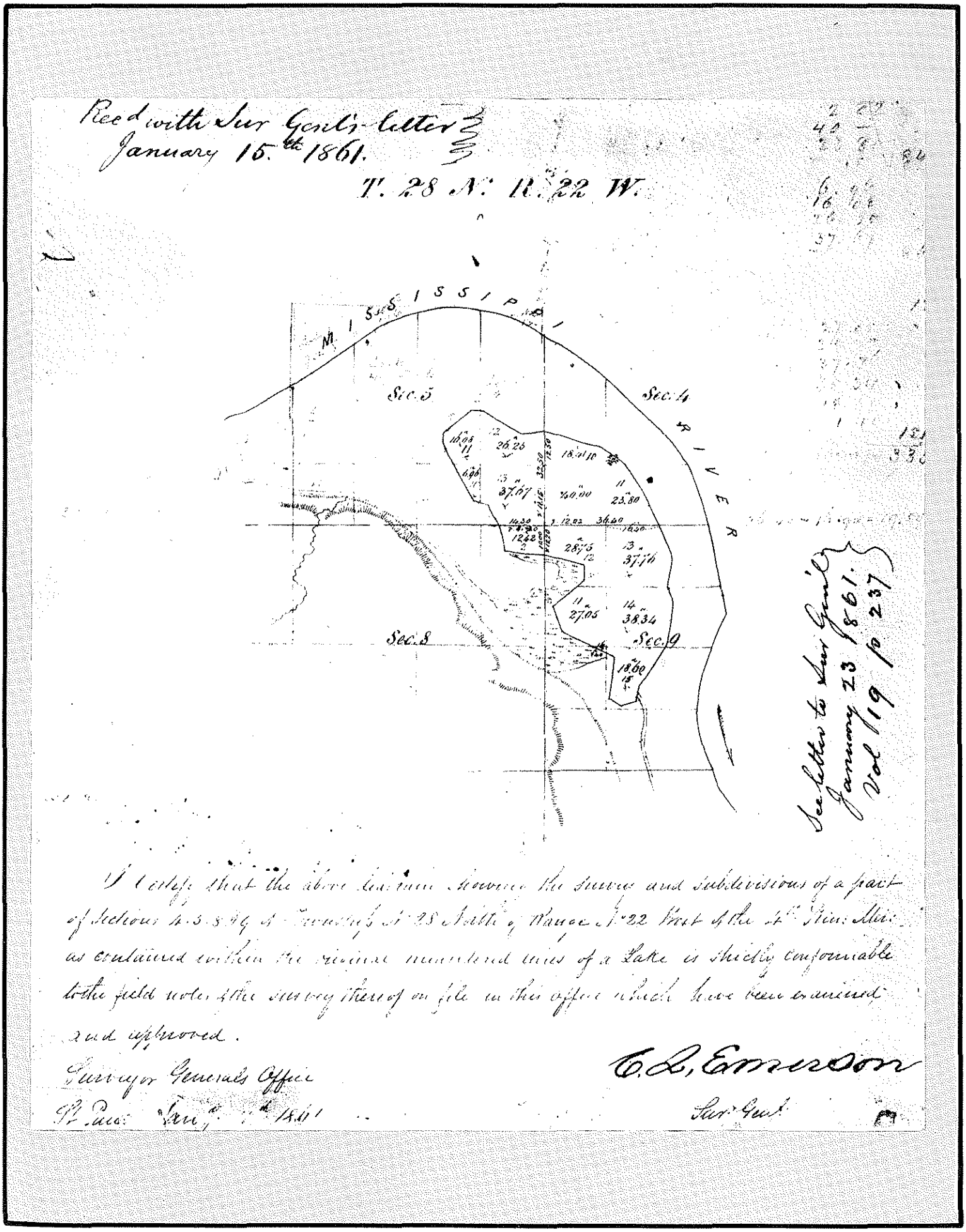


Figure 44. T.28N., R.22W., Fourth Principal Meridian, Minn. Completion Survey of Lake. Plat Approved January 4, 1861.

Commissioner of the GLO. Wilson returned to the position of Chief Clerk in the GLO.

On June 20, 1861, Edmunds notified William Cuddy, the new Surveyor General in St. Louis, that no appropriation had been made for the operation of his office and it would probably have to close by the end of June. On September 15, Cuddy was notified that $6,800 was allotted to him "for preparing the records to be turned over to the States." Cuddy operated for the next two years on "slush fund" moneys.

On February 17, 1862, the Supreme Court of the United States rendered the final decision in the case of *Johnston vs. Jones,* 66 U.S. 117, which involved a dispute over the division and ownership of lands formed by accretion along the waterfront in Chicago, Illinois. The court ruled that the accretion should be divided along the new waterline in proportion to the original holding along the old. The case is the basis of the "apportionment of frontage" rule, the method used today when applicable. The rule is well described in Sections 7-58 and 7-59 of the 1973 Manual.

On March 3, 1862, John A. Clark, Surveyor General of New Mexico, fled from Santa Fe because it had been invaded by Texas soldiers of the Confederacy. Clark packed up most of the records, except some of the Spanish Archives, and sent them to Fort Union. He returned to Santa Fe on May 20, 1862, and found almost everything in good order; the Texans had taken most of the furniture but had left the records unmolested.

By Sec. 4 of the *Act of March 14, 1862,* 12 Stat. 369, Nevada was made part of the California surveying district under the Surveyor General in San Francisco. The office in Carson City was closed after operating only six months. Confusion in the Nevada surveys followed.

The *Act of May 15, 1862,* 12 Stat. 387, created the Department of Agriculture, which would one day take administrative control of large areas of the public lands, and, in some cases, survey parts of those lands.

The *Homestead Law* was enacted by Congress on *May 20, 1862,* 12 Stat. 392. The law applied to persons over 21 years of age, "who has never borne arms against the United States Government or given aid and comfort to its enemies." The homesteader could acquire patent to 160 acres, upon proof of settlement and cultivation, conforming to legal subdivisions, after the lands had been surveyed. An original township survey in Nevada in 1948 was executed to allow patent on a homestead, filed on in 1923. The homestead patent could not issue until the land was officially surveyed. Patent to surveyed homesteads could be accelerated by a cash entry payment of $1.25 or $2.50 per acre. Although the Homestead Law was amended many times in later years, the basic law remained the same; 160 acres of agricultural land was given to anyone who would settle on it and plant a crop there. The law greatly increased the need for extension of the rectangular public land surveys.

The *Act of May 30, 1862,* 12 Stat. 409, was entitled "An Act to reduce the Expenses of Survey and Sale of the Public Lands in the United States."

Sec. 1 of the act states that contracts for surveys would not be binding on the United States until approved by the Commissioner of the GLO. Great delays in execution of the fieldwork resulted because of the lapse in time between a contract being negotiated by a Surveyor General, transmittal to and approval by Washington, return to the Surveyor General, and then finally a party outfitted and sent to the field. The fieldwork was usually executed the following field season, perhaps a year or more after the initial signing of the contract. But all subsequent contracts were approved in Washington until the contract system was abolished in 1910.

Sec. 2 of the act made the *1855 Manual of Surveying Instructions* part of every contract. The Manual, *Special Instructions of the Surveyor General,* when not in conflict with the Manual, and Instructions from the Commissioner, were also made part of the contracts. Thus, in theory at least, the conflicts between the 1855 Manual and the 1856 Instructions for Illinois and Missouri, were eliminated by law. The 1855 Manual was the controlling document and the Surveyors General could not issue instructions in conflict with it. But, as previously noted, the 1855 Manual contained no instructions for restoration of lost corners and subdivision of sections. Those rules continued to be formulated by the Commissioner with little consistency.

Sec. 3 gave the Commissioner full power to establish surveying fees within the maximum allowed and also required that the cost of surveying and platting private land claims be paid by the claimant before a patent could be issued.

Sec. 4 combined Utah and Colorado into one surveying district under the Surveyor General of Colorado; it also combined Nevada and California, as previously noted.

Sec. 8 gave the Surveyor General of New Mexico the additional duties of Register and Receiver. He was then in effect the entire land office in that large territory.

Sec. 10 of the act provided for the first of the "deposit surveys." Settlers wishing to speed up the surveys could apply and deposit a sum sufficient to pay the cost. The Surveyor General could then survey the township at the expense of the settlers; however, not many settlers chose to pay the costs this would incur.

The *Act of June 14, 1862,* 12 Stat. 427, was entitled "An Act to protect the Property of Indians who have adopted the habits of civilized life." The act provided for protection of those Indians who had received an allotment of tribal lands according to treaty stipulations. The Indian agent was to protect the allottee from trespass, etc. Nothing was said about how the agent was to determine the boundaries of an allotment and thus prove a trespass occurred. The method of surveying allotment boundaries was not spelled out by statute until the *Act of April 8, 1864.*

The *Act of July 1, 1862,* 12 Stat. 489, added another duty to the hard-pressed Surveyors General. The act was the huge railroad land grant to subsidize the construction of the Union Pacific and Central Pacific Railroads from the Missouri River to the Pacific Ocean. A right-of-way 200 feet in width on each side of the track and all odd-numbered sections for 10 miles each side of the track were granted. The grant did not apply to mineral lands. If necessary, the railroad was given the right of eminent domain (they could condemn private lands). Sec. 7 of the act required that the lands be surveyed as soon as any portion of track was completed.

This act and subsequent, similar, railroad grants placed a heavy burden on the surveyors. It also caused the partial survey of many townships. The act is very long and complex, prohibiting a synopsis here. For full details of this and other railroad grants, the acts themselves should be reviewed.

October 8, 1862, Thomas A. Townsend, the Surveyor General at Dubuque, suddenly died. James M. Edmunds directed Isaac N. Higbee, the Chief Clerk to operate the office, but Higbee could not approve surveys or enter into contracts. The law did not allow for an "acting" Surveyor General. Higbee conducted the business until Henry A. Wiltse was appointed to the post on January 29, 1863.

The *Act of February 24, 1863,* 12 Stat. 664, established the Territory of Arizona and the office of Surveyor General. All of the New Mexico Territory lying west of the present Arizona-New Mexico boundary, including part of present Nevada, was included in Arizona Territory. Levi Bashford was appointed Surveyor General in August 1863 and opened an office in Tucson on January 25, 1864. Apparently he never executed any surveys for there is no record of any. The *Appropriations Act of July 2, 1864,* 13 Stat. 344, attached Arizona to New Mexico under Clark at Santa Fe. Bashford was terminated and closed the office on July 4, 1864. The same act attached Nevada and Idaho to the Colorado surveying district and made Montana part of the the Dakota surveying district.

Some confusion may have resulted. Colorado was so remote from Nevada that John Pierce in Denver could hardly contract for surveys there. Plats of Nevada surveys were approved by Lauren Upson, Surveyor General of California, from 1864 to 1866.

The *Act of March 3, 1863,* 12 Stat. 754, required the President to reserve lands for townsites on rivers, harbors, and other prospective centers of population. The townsites were to be surveyed by the government into "urban and suburban lots of suitable size." This act was the origin of the so-called "Presidential Townsite", now codified in *43 U.S.C. 711-712.* The first townsite surveyed and lots sold under this act was the Townsite of Port Angeles in the present State of Washington.

The *Act of March 3, 1863,* 12 Stat. 808, established the Territory of Idaho, and included the area which is now the States of Idaho, Montana, and Wyoming. No provision was made for surveys.

On March 24, 1863, Edmunds replied to John Cross, County Surveyor of Page County, Iowa, on how to subdivide sections. Edmunds stated that the center quarter corner should be at the intersection of centerlines run between original quarter-section corners, with the exception of sections on exterior boundaries or where the sections were otherwise not normal. This letter was the first step away from the method used according to the 1856 Instructions.

On June 29, 1863, the following letter was written, probably by J. H. Hawes, who was the Principal Clerk of Surveys, in regard to the restoration of lost corners.

General Land Office
June 29th, 1863.

D. W. Maxon, Esq.,
Cedar Creek, Washington, Co., Wis.

Sir:

Your letter of the 12th inst., asking for information as to the proper mode of establishing lost corners of the public surveys, etc., is received. As stated in my communication of the 2d inst., this office does not assume to exercise any control over the surveying operations of county surveyors.

For the information of surveyors who may be called upon to re-establish lost corners of the public surveys or subdivide sections, the following general principles, based upon the laws of Congress and the regulations of the land department in accordance therewith, may be stated:

1st. Section and quarter section corners as established by the government survey, must, by law of Congress, stand as the true corners.

2d. Missing corners must be re-established at the identical point where the original posts were planted by the U.S. deputy surveyors.

3d. The legal presumption is, in the absence of any evidence to the contrary, that lost section and quarter section posts were originally established at the distances indicated in the field notes.

4th. Half quarter section corners must be established equidistant from the section and quarter section posts.

The first proposition above is in accordance with a law of Congress approved February 11th, 1805. To divide a section into quarters a *right line* should be run from the quarter section posts in one section line to the corresponding quarter section post in the opposite section line, even though one or more of these posts may have been established nearer to one section corner than the other, thereby giving to one quarter section more than 160 acres and to another less.

The second proposition grows out of the first, and is in accordance with the laws of Congress. It is the duty of the surveyor to re-establish missing posts in the exact locality where they were originally placed in the government survey. The proof of locality first sought to be obtained should be the "witness trees," or any other means of identification contained *in the field notes,* and next, clear and unquestionable testimony of any other kind. If no bearing trees, or other evidences in the field notes or elsewhere exist, by which the locality of the missing posts can be identified or determined in the field, then, as stated under the third head, the legal presumption is, that the missing section or quarter section corners were originally established in conformity with the distances expressed in the field notes, and the surveyor should so re-establish them.

Extinct quarter section corners, except on fractional section lines, when they cannot be identified as above, should be re-established equidistant between the section corners, in a right line between the nearest noted "line trees" each side of it, if there are any, but if none are found, then in a right line between the section corners. Extinct quarter section posts on section lines which close on the north and west, boundaries of townships, should be re-established, according to the original measurement there of, at 40 chains from the last interior section corner.

Extinct section corners may be re-established by running a right line between the nearest noted "line trees" north and south and east and west of the lost corner, if there be any such trees within the distance of the nearest quarter section, or section corners; but if no "line trees" be found, then between the nearest quarter section or section corners, and at the point of intersec-

tion of the two lines thus run, establish the section corner, with new bearings, to the nearest and most desirable objects.

The quarter mile posts are not established in government surveys, but are, by law, understood to be equidistant from the section and quarter section corners, as stated under the fourth head, and should be so established by the county surveyor.

It may be remarked, that where the measurement of any section line by the county surveyor does not correspond with the original measurement recorded in the field notes, lost corners should be re-established at *proportional distances* from each other between the known corners.

A proper application of the principles embraced herein will enable the practical surveyor to subdivide the public lands and re-establish the lost corners of the public surveys, in conformity with law and the regulations and usages of the land department.

There are some anomalous cases, such, for instance, as double corners on the north and west boundary lines of townships, an explanation of which must be omitted owing to the length of this communication. The general principles which should govern the county surveyor are, however, indicated with sufficient clearness to guide him in the rightful performance of his duties.

Very respectfully, etc.,
Jas. M. Edmunds, Commissioner.

The letter illustrates the problem of restoring lost corners and the value placed on "line trees", which were held to control the direction of a section line but not to control distance or proportion along that line. A lost quarter corner was restored at proportionate distance between the section corners.

The letter says that section corners should be restored by direct evidence first, and in accordance with the proportioned field notes second. Then it goes on to say the corner may be re-established at the intersection of east-west and north-south lines determined by line trees, quarter corners, or other section corners. The intersection method was enacted into law by the Missouri State Legislature (Missouri Statutes, Sec. 60.290) and was upheld by decisions of the State courts. However, the law could only apply to private lands in that state, not to public lands. This State statute was changed in 1979 and the laws there are now in close conformity with the 1973 Manual.

The Indian Reservation problem became more acute in 1863. Mark W. Delahay, Surveyor General at Leavenworth, Kansas, complained of the hodge-podge system to Secretary of the Interior J. P. Usher, who sent the complaint down to Edmunds for reply. Edmunds explained on July 30, 1863, that Indian boundaries were surveyed under various acts of Congress, some with Indian Office money and under Indian Office supervision, some by order of the President, some by order of the Secretary, and others by the Commissioner and/or a Surveyor General. There was no consistency in the methods of surveys or field notes and plats if any. Edmunds recommended a single law placing all the Indian surveys under the supervision of the Commissioner, it was passed a year later.

On August 10, 1863, *Special Instructions* were issued to J. H. Hawes, Principal Clerk of Surveys in the GLO, for the survey of Fort Howard Military Reserve at Green Bay, Wisconsin, and the Fort Crawford Reserve at Prairie du Chein on the Mississippi River. These old reserves were to be surveyed and disposed of under the public land laws, just two of many Military Reserve surveys which were to follow over the next 70 years or more. Those two surveys by Hawes were also made by a direct employee, not under a contract.

A letter dated September 3, 1863, written to Frank Dorr, County Surveyor, West Liberty, Iowa, advised him to double proportion the lost southeast corner of Sec. 28.

On October 26, 1863, Edmunds ordered Cuddy at St. Louis to close his office and turn over the Illinois and Missouri records to the Recorder of Land Titles in St. Louis; it was closed October 31, 1863. The Missouri records were finally transmitted to State authorities in August 1874. The Illinois records were transferred to State authorities in July 1869.

In the *1863 Annual Report,* Edmunds stated that island surveys were too expensive in relation to the money derived from the sale of small islands. Therefore, regulations were adopted requiring the applicant to pay for the survey.

On January 4, 1864, Edmunds replied to a man in Illinois who had requested a copy of the 1856 Instructions. He said these Instructions were no longer in accord with the rules and regulations of the Department but it was the only one available. They were now out of stock, more were to be printed, and he would send a copy when available. No copies of the 1856 Instructions were ever sent. In July 1871, a reprint of the 1855 Manual was made and copies were sent to all people who had requested instructions up to that time.

The *Act of March 21, 1864,* 13 Stat. 30, enabled Nevada to become a State. It was admitted by Presidential Proclamation on October 31, 1864, and was enlarged to its present boundaries by the *Act of May 5, 1866,* 14 Stat. 43.

The *Colorado Enabling Act* was also approved on *March 21, 1864,* 13 Stat. 32. The residents couldn't agree on a form of government. Congress approved the final enabling act on *March 3, 1875,* 18 Stat. 474, and Colorado was admitted by Presidential Proclamation on August 1, 1876. The surveys had been in progress since 1861.

The following letter was sent to Warren Beckwith on March 30, 1864, in response to his inquiry about the proper method of subdividing a section:

General Land Office
March 30th, 1864.

WARREN BECKWITH, Esq.,
Geneva, Wis.

Sir:

I am in receipt of your communication of the 23d inst., inquiring as to the proper mode of subdividing sections into legal subdivisions. The law of Congress approved Feb. 11th, 1805 (U.S. Statutes, page 313, Little & Brown's edition), gives explicit directions how this shall be done. This law has not since been repealed or modified, and hence the true and only lawful mode of subdividing sections is the one described therein.

By this law the following definite and fixed rules are enunciated, to wit:

1st. All corners once established in the field, and approved and returned by the proper officers, shall

stand as the true corners they were intended to designate, even though the intervals do not correspond with the measurements in the field notes.

2d. All boundary lines of legal subdivisions which shall not have been actually run and marked in the field, shall be ascertained by running straight lines from the established corner to the opposite corresponding corner.

It will be seen from the foregoing rules that the correct mode of dividing sections is by running straight lines from quarter post to opposite quarter posts, the common center being determined by the intersection of the lines so run. Great care should be taken in running such subdivisional boundaries to first identify the existing corners as the true original corners established by the U.S. surveyor.

Very respectfully, etc.,
Joseph S. Wilson,
Acting Commissioner.

An identical letter was sent to L. M. Dyer at White Hull, Green County, Illinois, on April 13, 1864. Although signed by Chief Clerk Wilson, they were no doubt written by J. H. Hawes, Principal Clerk of Surveys.

The *Act of April 8, 1864,* 13 Stat. 39, was entitled "An Act to provide for the better Organization of Indian Affairs in California." The main part of the act deals with Indian reservations and affairs in that State. But Sec. 6 of the act states:

> "That hereafter, when it shall become necessary to survey an Indian or other reservations, or any lands, the same shall be surveyed under the direction and control of the general land-office, and as nearly as may be in conformity to the rules and regulations under which other public lands are surveyed."

This section is now codified in *25 U.S.C. 176.*

The act clearly places the survey of Indian and other reservations under the regulations and methods of the regular public land surveys. After passage of the act, the boundary surveys were made under contracts with the Surveyors General or under contract with the Commissioner of the GLO. When township, sections, and section subdivisional lines were surveyed within reservations, it was nearly always by contract with a Surveyor General, except for those made in the Indian Territory (Oklahoma).

On April 28, 1864, Edmunds wrote to the Chairman of the Committee on Public Lands. He was proud of a departure from the rectangular system in mountains and valleys, done in accordance with Sec. 4 of the *Act of March 3, 1853,* 10 Stat. 244, which allowed such departure; he recommended the idea.

Edward F. Beale in California had contracted for the survey of lands around Honey Lake in California and in the Humboldt River Valley in Nevada. These were deemed to be "lands fit for agriculture" and were also along the route of the Pacific Railroad. Mineral lands and lands "unfit for cultivation" were precluded by law from the surveys. Desert mountains certainly were unfit for cultivation and may have contained minerals as well. How were the surveys to be extended into Honey Lake and Humboldt Valley? Using the provisions of Sec. 4 of the 1853 law, Beale told the deputies to run an offset by traverse lines. The Fourth Standard Parallel North was extended into Honey Lake by 52 miles of traverse along the eastern base of the Sierra Nevada. The Sixth Standard Parallel North was extended easterly for 115 miles by traverse around the base of the mountains into Humboldt Valley. But, no corners were established along those traverse lines. Ironically, the Commissioner would not allow a $1,725 payment for those 167 miles of "line" because of no corners being set to monument them. That didn't make the deputies very happy, nor the new Surveyor General, Lauren Upson. Had corners been established, perhaps payment would have been allowed.

No instance is known in which traversing the base of mountains was later used in California and Nevada, but the method was used in New Mexico, at least in 1873. There a "meander line" (actually a traverse) was run along the base of the mountains and fractional lots returned against the meanders as though the mountains were similar to a lake. Where the section lines intersected the base of the mountains, "Fractional Section Corners" (marked FS) were set and the meanders run between them. Careful research has not found a law specifically approving this procedure; perhaps the Committee on Public Lands didn't consider it necessary or if a law was recommended, Congress declined to enact it.

The *Act of May 26, 1864,* 13 Stat. 85, established the Territory of Montana, greatly reducing the Idaho Territory, and authorized appointment of a Surveyor General for Montana. But on July 2, 1864, Montana was attached to the surveying district of Dakota. No Surveyor General was appointed until 1867.

On June 1, 1864, Commissioner Edmunds issued instructions to the Surveyors General relating to the surveys that updated the 1855 Manual in many respects.

The main changes by item number were:

7. Small islands were to be surveyed at cost to the applicant and procedures were given for obtaining such survey.
8. Notes and procedures were to be kept for determining "swamp lands."
9. Non-navigable rivers were to be meandered along only one bank, the right bank if possible.
10. Increase the size of lakes to be meandered to 40 acres; long narrow lakes were not to be meandered and payment was not to be allowed for measuring across or offsetting around a lake.
18. Correcting back on true line is to be by bearing instead of a change in variation.
20. Prescribes closing limits and limits on length of section lines in clearer form than the 1855 Manual.

These instructions or manual modifications were reissued in 1871 in the same form and are included in the Appendix for full review.

The *Act of July 1, 1864,* 13 Stat. 343, placed the coal lands that had been reserved since 1841 on sale by legal subdivision at a minimum price of $20 per acre. Sec. 2 and the remainder of the act are general townsite laws pertaining to townsites on the surveyed or unsurveyed public lands. Townsites up to 640 acres with boundaries conforming to the rectangular surveys were authorized. It is probable that most of the townsites on public lands were made under this act. It is codified in *43 U.S.C. 713-717.*

The *Act of July 2, 1864,* 13 Stat. 356, extended the Union Pacific Railroad land grant to all the odd-numbered sections, for 20 miles on each side of the right-of-way, up from the previous 10 miles.

Also on *July 2, 1864,* 13 Stat. 365, Congress granted lands to subsidize construction of the Northern Pacific Railroad. The grant was for a right-of-way 200 feet on each side of the track and all odd-numbered sections for 20 miles on each side of the right-of-way.

In the *1864 Annual Report,* Edmunds requested a law allowing for traverses along the base of mountains, as detailed above. He reported that the Big Tree Grove and Yosemite Valley in California had been granted to the State by *Act of June 30, 1864,* 13 Stat. 325, and that the *Act of May 5, 1864,* 13 Stat. 63, provided for the survey of certain Indian reservations in Utah into allotments. The Yosemite Valley would eventually be returned to government ownership as part of Yosemite National Park. The move to conservation and preservation of the natural wonders had begun in earnest.

In January 1865, Nathan Butler in Indiana asked advice on the proper method of subdividing a section into quarter-quarter sections. On January 20, 1865, the following reply was sent:

Department of the Interior
General Land Office
January 20, 1865

Nathan Butler, Esq.
Fort Wayne, Ind.

Sir:

In answer to your letter of the 11th inst., I have to state that to subdivide a quarter section in accordance principles established by law of Congress for the survey of the public lands, the proper mode is to run a straight line from a point *equidistant* between the ¼ post and section corner to a point equidistant between the opposite ¼ post and section corner, such lines to be run either east and west *or north and south* as the case may be, when it is desired to bisect the quarter section, and both north and south *and* east and west when it is desired to divide the quarter section into four legal subdivisions.

It must be observed however, if the section is on the north boundary of the Township the east and west line bisecting the *north* half of the section must be run from a point 20 chains north of the ¼ post in the east boundary of the section to a point 20 chains north of the ¼ post in the west boundary; so too if the section is on the west boundary of a Township the north-and-south line bisecting the west half of the section must be run from a point 20 chains west of the ¼ post in the south boundary line to a point 20 chains west of the ¼ post in the north section line.

It is proper to remark that if in the above cases the distance from the ¼ post to the section corner is found by the surveyors measurement to be more or less than the distance stated in the government survey, the subdivision point should be fixed proportionately between the corners. For illustration, if the distance between the ¼ post and section corner is stated in the government survey to be 41.14 chains and by the surveyors measurement it is 40.76 chains then:

as 41.14:20::40.76: the true starting point north or west of the ¼ post.

The lawful mode of subdividing a section into quarters is by running a straight line from ¼ post to ¼ post.

Very respectfully
Your Obt. Ser't
J. M. Edmunds
Commissioner

Butler wrote back on February 6, 1865, disagreeing with the above method, suggesting that the quarter section should be subdivided in the same manner as the section itself was subdivided into quarter sections. He received the following letter in response:

Department of the Interior
General Land Office
February 16, 1865

Nathan Butler, Esq.
Fort Wayne, Ind.

Sir:

I have your letter of the 6th inst., referring to the mode of subdividing a quarter section into quarters. The mode you suggest is not, in the opinion of this office, the proper one. The principles which should govern in dividing sections into legal subdivisions are laid down in the law of February 11, 1805. The rule there given is, that "the boundary lines, which shall not have been actually run and marked, shall be ascertained by running straight lines from the established corners to the opposite corresponding corners".

While this rule has more especial reference to the division of the section into quarters, it is based upon certain principles enumerated in another part of the same law, and the subdivision of a section into quarters under this rule involves percisely the same points of objection and inequality that occur in the subdivision of the quarter section.

The law nowhere provides for the establishing of corners in the interior of a section, but it does point out specifically how the section, quarter section and quarter quarter section corners shall be established on the exterior lines of the sections and it also directs that the quarter section shall be bounded by straight lines running from ¼ post to ¼ post. This rule is equally applicable where one ¼ post is not precisely in place; the division in that case must give to one quarter more and to the other less than the 160 acres contemplated in the law. I think the same principles should be applied to the subdivision of a quarter section. The quarter mile posts should be established equidistant from the section and quarter section corners as the law specifically directs, and straight lines should be run from one post to its opposite corresponding post, *through the section* and those lines will be the true and lawful boundaries of the 40 acre subdivisions.

The objection which you suggest, that the owner of an adjoining quarter section might object to the surveyor crossing his lands if it were tenable, would in certain cases also prevent the subdivision of a section into quarters in accordance with the law above cited. As for instance, where one party has purchased the *north half* of a section, and two other parties owning the S. E. and

S. W. quarters, desire the boundary line between them established. The law in this case is plain, the line must be run from the ¼ post in the north boundary, and to establish this line in pursuance of the law the surveyor must cross the north half of the section.

In the opinion of this office the corners established on the section lines should govern the subdivision of sections, and the boundaries of all legal subdivisions should be determine by running straight lines through the section from one corner to its opposite corresponding corner.

Your application....

Very respectfully
Your Ob't Ser't
J. M. Edmunds
Commissioner

Although signed by Edmunds, these letters were undoubtedly written by J. H. Hawes, Principal Clerk of Surveys. In them, Hawes correctly quoted and pointed out the principles given by the *Act of February 11, 1805,* which specifically dealt with the subdivision of the old two-mile blocks into individual sections and the subdivision of sections into half or quarter sections, the smallest legal subdivision at that time. What Hawes completely overlooked was the *Act of April 5, 1832,* which specifically stated that the "contents of quarter-quarter sections, which may thereafter (after May 1st) be sold, shall be ascertained as nearly as may be, in the *manner,* and *on the principles,* directed and prescribed by the second section" of the *Act of 1805*. The quarter sections are also to be subdivided in the same manner as the sections were subdivided. Butler was advocating the proper method of subdividing a quarter section on different grounds—equity and economy (only one mile of survey instead of two miles to subdivide a given quarter section). Although equity and economy are good reasons, even though the result be the same, they were not the basis for the law, which was written to settle boundary disputes by statute and end contentions. Yet, as we see in this exchange, only 30 or 60 years later, different individuals interpreted the law as they chose to view it, rather than look to its roots for the answers. This improper method of subdividing a normal quarter section pervailed, as a general policy until 1871.

By Sec. 3 of the *Appropriations Act of March 2, 1865,* 13 Stat. 460, Nevada was reattached to the surveying district of California. Upson was instructed to extend the surveys along the line of the Pacific Railroad but received no money for the work.

In the latter part of March 1865, John A. Clark, Surveyor General of New Mexico, took an inspection trip through Arizona. He visited the area southwest of Phoenix at the junction of the Gila and Salt Rivers. On a conical hill just south of the junction and south of the Gila River, a boundary monument had been erected by the Mexican Boundary Commission in 1851, which marked the U.S.-Mexico boundary prior to the Gadsden Purchase in 1853. Clark reported on May 24, 1865, that he had adopted this monument as the initial point for the Gila and Salt River Meridian in Arizona, but he had no funds, so no surveys were run from that monument until two years later.

On April 10 and April 20, 1865, John Pierce in Denver contracted with Joseph Clark, Deputy Surveyor, for the survey of the exterior boundaries and subdivisional lines of the Spanish Fork, Cow Creek, San Pete, and Deep Creek Indian reservations in Utah. Clark began these surveys in July 1865 and completed them in October 1866. He first ran the exterior boundaries, setting a monument every 20 chains, then subdivided them into 40-acre tracts, again setting monuments every 20 chains, the first of the Indian Allotment surveys that were discovered. The reservations were not subdivided into regular sections first, however, and in fact were not tied to the rectangular surveys until three years later. Clark reported that all the rectangular corners had been destroyed by either time, weather, or the settlers.

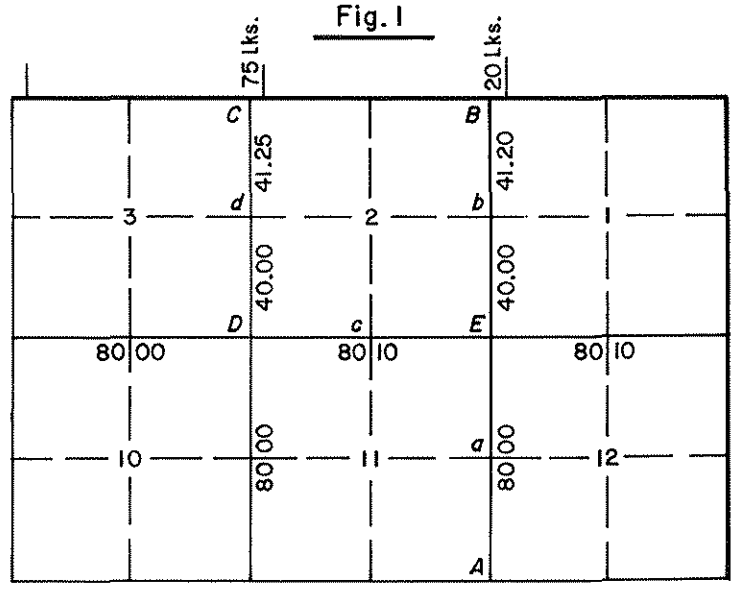
On July 30, 1865, Anson G. Henry, Surveyor General of Washington Territory, drowned when the steamship Brother Jonathan struck the Point St. George Reef near Crescent City, California, and sank. One hundred and ten people including Henry were lost. The Olympia Office was operated by E. Giddings, Chief Clerk, until Selucius Garfield was appointed and filled the vacancy in April 1866.

In the *1865 Annual Report,* Edmunds reported that since no appropriation for surveys had been made, very few were done except those in the Indian reservations, and what few had been made, were done with leftover funds. He also reported that the California-Nevada boundary had been surveyed north from Lake Bigler, now Tahoe, and southeast for 102 miles along the oblique line, but that these boundary lines were not acceptable to the GLO. The line north from Lake Tahoe is still in dispute.

On April 9, 1866, the following instructions were sent to H. M. Cankin at Greenville, Michigan, in reply to his request about the proper method to be used in restoring lost corners. These instructions were a stock answer being used at that time in reply to such requests.

"The following examples will illustrate some of the more difficult of the rules for restoring corners.

Fig. I



Example 1. — Required to restore the missing section corners *B, C, D, E,* and the quarter sections corners *a, b, c, d.* Fig. I.

Mode. — In this example it will be observed that two sets of section corners were established on the north boundary of the township. From the original field notes it appears that the section line between sections 1 and 2 intersected the township line 20 links west of the corner established when said township line was run. Therefore plant the corner *B* 20 links west of such corner; then proceed to the corner *A* and run a random line north, setting temporary posts at 40 chains, 80 chains, and 120 chains, noting the excess or deficiency on the last half mile, and the falling east or west of the newly erected corner.

Calculate a course that will run a true line from *B* to *A*, and if the distance by the present measurement be more or less than that stated in the original field notes, plant the permanent quarter section corner b at a proportional distance:

Thus; the original distance from *A* to *B* was 161 chains and 20 links: suppose the distance by the resurvey to be 162 chains 10 links, then-

As 161.20:162.10::41.20 (*B* to *b*, original measurement) = 41.43. The permanent quarter section corner *b* should therefore be re-established 41 chains 43 links south from *B*.

The distance by present measurement from *b* to *A* will of course be (162.10-41.43 =) 120 chains and 67 links. The remaining corners *B* and *a* must likewise be restored at proportionate intervals, but as these intervals were equal in the original survey they will be equal in the resurvey; therefore, by dividing the remaining distance into three equal parts we shall have the correct distance at which these corners should be re-established, to wit: 120.67 ÷ 3 = 40.22½ = the true distance from *b* to *E* and also from *E* to *a* and *a* to *A*.

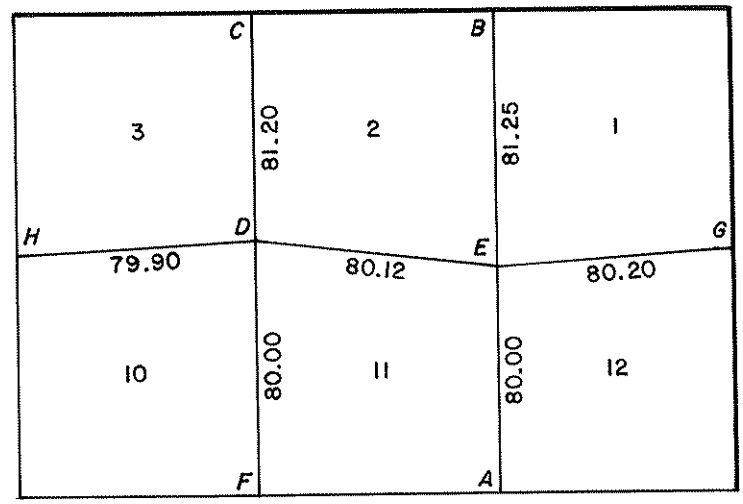
Proceed in the same manner to restore the corners *C*, *D*, *d*, after which plant the quarter section corner *c* equidistant between the section corners *D* and *E*.

In the foregoing example it will be observed that the boundary lines of the sections are of uniform length east and west. Were these lines of various lengths, say from 5 to 75 links, the mode described in the preceding example would not be correct, for it will be remembered that *all* corners are to be restored at *proportional* distances. This is as true in regard to east and west lines as it is of north and south lines; there is no difference in this respect. When, therefore, there is any material difference in the intervals between the section corners east and west, as is frequently the case, the distances must be made proportional east and west as well as north and south, even though at the expense of regularity in the configuration. The mode of proceeding in such cases will be better understood by reference to the following illustration:

Example 2. — Required to restore the section corners *D* and *E* and all the quarter section corners. Fig. II.

Mode. — It appears from the field notes of the United States survey that the original intervals between these *section* corners were unequal, therefore they cannot be restored equidistant, but the proportional distances

Fig. 2



must be preserved. To this end the county surveyor should remeasure the section lines *A B*, *C F*, and *G H*. This done he will have the data from which to make the necessary calculations to enable him to re-establish the lines and corners correctly.

Suppose the result of the remeasurements to be as follows: *A B*, 162.20 chains; *C F*, 160.80 chains; and *G H*, 242.40 chains. Now the distance from *A* to *B* is set down in the original field notes at 161 chains 25 links. Therefore,

As 161.25:162.20::80.00 = 80.47 = the true length of the line *A E*, according to present measurement, and 162.20- 80.47 = 81.73 chs. from *E* to *B*. So also —

As 161.20:160.80::80.00:79.80 chs. *F* to *D*.

And 160.80-79.80 = 81.00 chs. *D* to *C*.

The distance from *G* to *H* as indicated in the original field notes, was 240.22 chs. Then,

As 240.22:242.40::80.20:80.92¾ chs. *E* to *G*.

240.22:242.40::80.12:80.84 chs. *D* to *E*.

and 242.50-(80.92¾ + 80.84 =) 161.76¾ = 80.63¼ chs. *D* to *H*.

Having provided the above data, proceed to *A* and remeasure the south boundary of section 12. Having calculated *a* course that will run from *A* to *E*, plant the ¼ section corner at 40.86½ chs., and the section corner *E* at 81.73 chs. Then run a random line to G, planting the ¼ section corner at 40.46⅜ chs., and correct back on a true line.

The original distance from *E* to the ¼ section corner north of it was, of course, 40 chs. The distance from *E* to *B*, by present measurement, is 81.73 chs. Then,

As 81.25:81.73::40.00:40.23½.

Calculate a course which will run from *E* to *B*, and establish the quarter section corner 40.23½ chs. north from *E*.

Return to *F* and proceed in the same manner to restore the corners on the section line from *F* to *C*.

By this mode, the quarter section corners between *E B* and *D C* will have been established at proportionate distances between the respective section corners, and

all the other ¼ section corners equidistant between their respective section corners, in conformity with the law."

As can be seen, in Example 1 the restoration is by single proportionate measurement along a straight north-south line between found corners, treating the closing corner at "B" as found. This method is justified inexplicably because the east-west section lines were originally the same length. Example 2 is a strict double proportionate restoration of the lost corners between the found original corners based on the original record. This general policy, outlined in these instructions on restoration of lost section corners, would remain in effect until about 1880.

On June 19, 1866, Henry Wiltse at Dubuque was ordered to close his office by June 30 and turn over the Wisconsin records to the State and Iowa records to William Johnson, the Custodian in Dubuque, for safekeeping. The Dubuque office was closed and the Wisconsin survey records and plats were turned over to that State on August 1, 1866. After Iowa passed the necessary legislation, the records were turned over to its authorities in March 1868. Subsequent surveys in Iowa were executed under the Surveyor General of Nebraska until 1886.

The *Act of June 29, 1866,* 14 Stat. 77, authorized appointment of a Surveyor General for Idaho. Lafayette Cartee, who had been a deputy surveyor in Oregon for many years, was appointed and established his office in Boise City on November 7, 1866. The initial point for the Boise Meridian, which controls all the rectangular surveys in Idaho, was established in April 1867 on a rocky butte about 19 miles southwest of Boise. Deputy Surveyors Peter W. Bell and Allen M. Thompson began the survey of the baseline and meridian from that point.

The *Act of July 4, 1866,* 14 Stat. 85, reestablished the Surveyor General for Nevada; William B. Thornburgh was appointed and opened his office in Carson City on November 27, 1866. The act allowed for a departure from the rectangular system for the surveys in Nevada if the situation warranted the change. This may have been authorizing the use of traverse lines to get the surveys into remote areas; if so, there is no indication that it was used. The act also withdrew all mineral lands from survey and entry under the public land surveys.

A change in the method of subdividing sections was made on July 6, 1866, as will be seen by the following letter:

H. S. Hoover, Esq.
Waverly, Bremer Co.
Iowa

Department of the Interior
General Land Office
July 6, 1866

Sir:

In your letter of the 16th ultimo you inquire how sections of the public lands should be subdivided. As you do not refer to any particular section, I assume that your inquiry does not relate to peculiar or anomalous sections but to the regular sections containing 640 acres. The law prescribes the following rules for subdividing sections: —

The section and quarter section corners established by the U.S. Deputy must stand as the true corners. To divide the sections into halves or quarters *straight lines* must be run from the established corners to opposite corresponding corners, the intersection of the lines so run will be the legal center of the section. The quarters may be again divided into half quarters or quarter quarters by straight lines run from points equidistant from the center of the section and the quarter section post to their corresponding opposite points equidistant between the section corners, and intersection of lines thus run will be the legal center point of the quarter section.

Very Respectfully
Your Ob't Ser't
J. M. Edmunds
Commissioner

This is the exact method that was prescribed by law and the same method that is used today, but it didn't stay that way, as will be seen.

The *Act of July 25, 1866,* 14 Stat. 239, granted lands to the Oregon and California Railroad. All odd-numbered sections, ten miles on each side of the right-of-way, were granted with indemnity selection to an additional ten miles. Actually the railroad received all odd-numbered sections for 20 miles each side of the railroad, which were not already claimed or mineral in character. The railroad defaulted on conditions of the grant and the unsold lands in the grant were revested to the United States in 1916. These Oregon and California ("O. & C.") lands are administered by the BLM and constitute a large part of the dependent resurveys presently executed in the State of Oregon.

Also on *July* 25, *1866,* 14 Stat. 242, Congress passed an act granting to Adolph Sutro a right-of-way and up to two sections of land (to be paid for at $1.25 per acre) to construct an exploration and drainage tunnel to the Comstock Lode at Virginia City, Nevada. The long silence on the mineral lands was being broken.

The *Act of July 26, 1866,* 14 Stat. 251, was the first lode mining law. Prior to this law, all mineral lands were sold by legal subdivisions of the rectangular system. This act provided for a right-of-way for the construction of ditches and canals across the public domain and for metes and bounds surveys of lode mining claims up to 200 feet in length. The Surveyors General were made responsible for the surveying and platting of the claims; the costs were to be paid by the claimant.

Sec. 4 of the act is perplexing, and reads in part:

"That when such location and entry of a mine shall be upon unsurveyed lands, it shall and may be lawful, after the extension thereto of the public surveys, to *adjust the surveys* to limits of the premises according to the location and possession and plat aforesaid, and the Surveyor-General may, in extending the surveys, *vary the same from a rectangular form* to suit the circumstances of the country and the local rules, laws, and customs of miners . . ."

This could be interpreted to mean that the rectangular surveys could be varied and adjusted to fit with the mining claims; if it did, it isn't known how such an adjustment could have been accomplished.

There is no known record of a Surveyor General attempting to utilize the provision during the six-year life of the act.

When the rectangular surveys were extended through a mining claim area, it was done in the normal manner without regard to the claims themselves, which were then segregated from the sections.

Sec. 8 of the act reads:

> "That the right-of-way for the construction of *highways* over public lands, not reserved for public uses, is hereby granted."

This section is the basis of many thousands of miles of roads and highways built across the public domain. All that really had to be done to acquire a highway right-of-way under this act was to build one. Subsequent patents were automatically subject to an existing highway across the land. If a State or territory passed legislation accepting the grant and specified the location and width of a right-of-way for highways, all subsequent patents were subject to it. For example, in 1871 the Dakota Territory declared by law a road right-of-way 66 feet in width along all section lines. All subsequent patents were taken subject to that reservation. Sec. 8 of this important act is now codified in *43 U.S.C. 932*.

Sec. 9 made reservation for construction of ditches and canals across public lands. Miners were allowed to construct ditches to bring water to their claims. Further legislation on ditches and canals came in 1890.

Secs. 10 and 11 of the act allowed preemption and homestead on the agricultural lands in the known mineral areas if the lands were shown to be nonmineral bearing. This provision would later require mineral segregation surveys.

Sec. 16 of the act extends the rectangular system over the mineral lands, which had been excluded from survey since 1853.

The *Act of July 28, 1866,* 14 Stat. 339, legalized the metric system of measurements in the United States; however, as of 1980, the metric unit has not been used in the Public Land Surveys in this country.

Another *Act of July 28, 1866,* 14 Stat. 344, directed that the Surveyor General's office for Iowa and Wisconsin at Dubuque, Iowa, should be closed and moved to Nebraska with a new surveying district to include Nebraska and Iowa. The closure had already occurred, as previously noted. Phineas W. Hitchcock was appointed the new Surveyor General on April 4, 1867; he got the furniture from Johnson in Dubuque and established his office in Plattsmouth, Nebraska, in June. Kansas became a separate surveying district and the Surveyor General remained at Leavenworth.

On July 28, 1866, Edmunds issued a *Circular* to all Surveyors General which amended Diagram B of the 1855 Manual. The system of lot numbering was changed to that still used today; the odd system of having two Lots 1 and two Lots 2 in a section was eliminated.

On September 1, 1866, Joseph S. Wilson again became Commissioner of the GLO; he was the only Commissioner ever to serve two separate terms in that office.

On December 1, 1866, Wilson sent a Special Agent to New Orleans with instructions to recover the Louisiana records from the State authorities, inventory them, and prepare lists.

On December 11, 1866, Wilson ordered Thornburgh to move the Nevada Office from Carson City to Virginia City. Perhaps Thornburgh refused, because on May 27, 1867, Anson P. K. Safford became Surveyor General of Nevada and made that move.

In January 1867, William H. Pierce, Deputy Surveyor, began the survey of the Gila and Salt River Baseline in Arizona, starting from the initial monument selected by Clark. The surveys of township and range lines were extended from the baseline by Wilfred F. and George P. Ingalls, under contract with the Surveyor General of California. The Arizona surveys were finally under way.

The *Act of February 9, 1867,* 14 Stat. 391, enabled Nebraska to become a state and was admitted by Presidential Proclamation on *March 1, 1867,* 14 Stat. 820.

The *Act of February 25, 1867,* 14 Stat. 409, granted lands for three miles on each side of a military road which was to be constructed from The Dalles, Oregon, to Boise, Idaho. Again as in the railroad grants, the Surveyor General had to survey the section lines as soon as possible after any portion of the road was completed. This was just one of many such wagon road grants.

The *Appropriations Acts of March 2, 1867,* 14 Stat. 440 and 457, provided funds for, and authorized, topographical and geological surveys to be made in Nebraska, and between the Rocky Mountains and the Sierra Nevada in California. These geological surveys were made under supervision of the GLO and were made by expeditions under the direction of Ferdinand V. Hayden. In 1869, further explorations were authorized, which were conducted by John Wesley Powell from 1869-1875. The Hayden and Powell surveys were the forerunners of the U.S. Geological Survey (USGS). By this act, Arizona was attached to the California surveying district.

The *Act of March 2, 1867,* 14 Stat. 542, again authorized the appointment of a Surveyor General for Montana Territory and made it a separate district; Soloman Meredith was appointed on April 18, 1867, and subsequently established the office at Helena. Commissioner Wilson had directed Meredith to establish a Principal Meridian on Beaver Head Rock about 12 miles north of Dillon, Montana. Instead, Meredith established the initial point on a limestone hill, 800 feet high, about 12 miles southwest of the junction of the three forks of the Missouri River. The Principal Meridian and Baseline surveys were begun by Benjamin F. Marsh in August 1867. The Principal Meridian in Montana has no given name or number; it is identified just as the Principal Meridian, Montana, and controls all of the rectangular surveys within that State and none other.

Another *Act of March 2, 1867,* 14 Stat. 541, was another law for townsites on the public lands. It is the basis of what is now called a Trustee Townsite, and is codified in *43 U.S.C. 718-721.* The maximum of 2,560 acres could be taken up by legal subdivision as a townsite under this act.

On March 13, 1867, Wilson dispatched a Special Agent to Florida with instructions to gather and inventory the Spanish Archives on private land claims. On August 5, he ordered the agent to get the Surveyor General's records from the State Register, inventory and list them, and then turn them over to the U.S. Attorney for safekeeping.

On March 30, 1867, the United States purchased Alaska from Russia, adding that huge territory to the public domain.

A slight softening of the former hard stand on dried-up lakes occurred in 1867, as indicated by the following letter:

T. N. Stevens, Esq.
Greenville,
Michigan
Sir:

Department of the Interior
General Land Office
June 4, 1867

I am in receipt of your letter of the 21st Ulto. in reference to a lake originally meandered, and subsequently partially drained, situated in sections 1, 2 and 11 of T. 9 N., R. 9 West, Michigan.

In reply I have to state that where lakes originally meandered become dry land, by any cause, the land no longer subject to overflow, and suitable for cultivation, it is regarded as public land over which the lines of the public surveys should be extended and the same disposed of as other public lands.

But where such lakes become partially drained by evaporation or other causes the land from which the water has receded inures to the respective riparian proprietors for their use and occupancy.

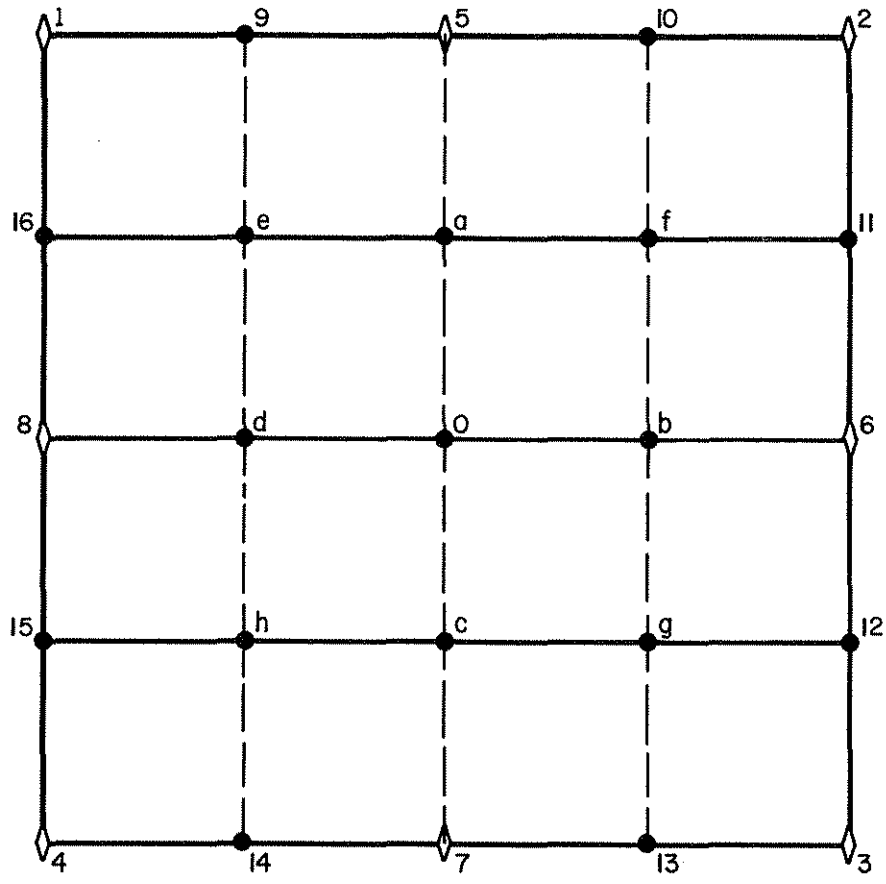
In reference to the common boundary of lots 2 in sections 1 and 2 if the water between them had entirely disappeared the extension of the section line between those two sections would constitute the common boundary of such lots; but as there yet remains a portion between the lots covered by water the margin of the slough or stream constitutes the boundary of those lots, and the remaining portion covered by water maintains its original status as meandered water.

So long, therefore, as any portion of the lake as originally meandered remains covered by water or subject to periodical overflow the lines of the public surveys cannot be extended over it nor the land disposed of by the government.

I am Sir —
Very Respectfully
Your Ob't Ser't
Jos. S. Wilson
Commissioner

This has been recognized as a "Catch 22" policy. The riparian adjoiner has temporary riparian rights, can use the land exposed by reliction, but when it all dries up, he loses it to the government. It would be to his advantage to make sure the lake never did completely dry up, even if he had to dig a pond

CORNER IDENTIFICATION ON INDIAN RESERVATIONS



— = Surveyed lines
—◊— = Section and 1/4 corners
—●— = Corners at equidistant position
1, 2, a, b = Identifying designation

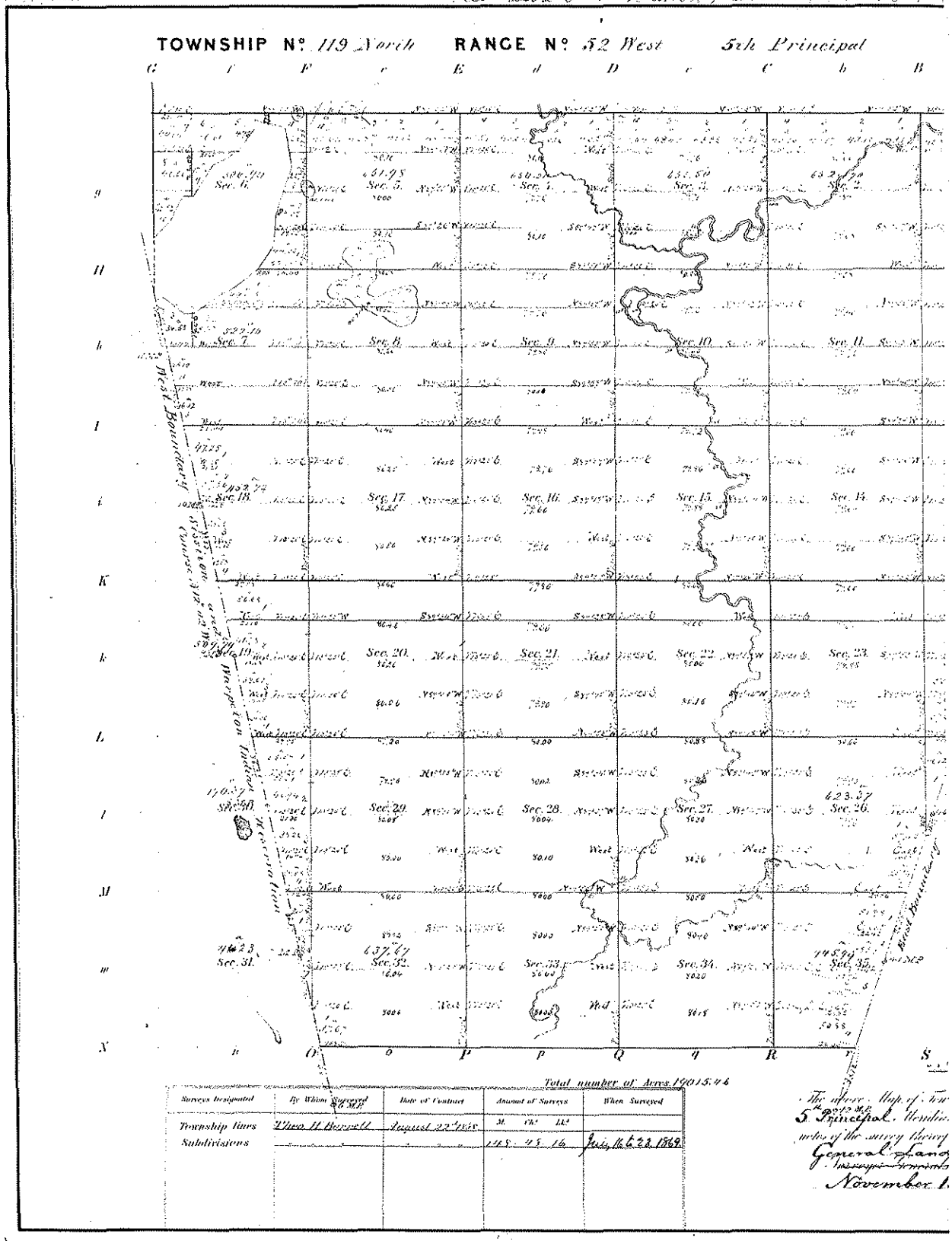
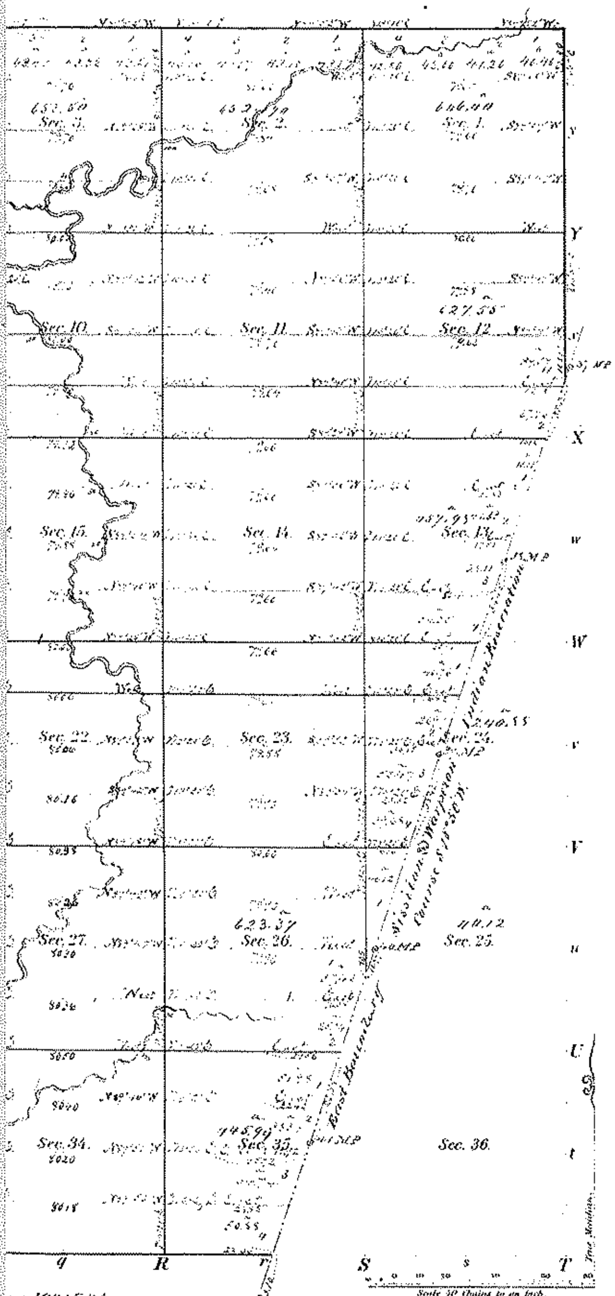


Figure 46. Warpeton and Sissiton Reservation with "Three Mile" Subdivisions.

Parrell's letter of Oct 23 1869

st 5th Principal MERIDIAN Dakota.



Certified G.L.O. Report No. 19244.

Meanders of Lake partly in T. 119 N. R. 52 W.

Posts	Courses	Ch.s Lk.s	Posts	Courses	Ch.s Lk.s	Posts	Courses	Ch.s Lk.s
	in Sec. 7							
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	East	6.36						
	[illegible]	17.00						
	[illegible]	7.[illegible]						
	[illegible]	[illegible]						
	in Sec. 2							
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	[illegible]	[illegible]						
	[illegible]	13.00						
	S 43½ W	12.21						
		[illegible]						
Total		[illegible]						

res. 19015.46

1869.

The above Map of Township No. 119 N of Range No. 52 W of the 5th Principal Meridian Dakota T. is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved.

General Land Office
~~Surveyor General's Office~~
November 11 1869

[signature]
Commissioner

Posted Aug. 30/92
J.A.C.

to retain some water. But this was the first admission by the GLO that owners adjoining a non-navigable lake may have riparian rights. This "temporary use" policy remained in effect to the end.

After Wilson became Commissioner for the second time, J. H. Hawes left the GLO. In 1867, he began writing his *Manual of United States Surveying* and had it published in 1868. Several inquiries were received in the GLO about the book requesting a copy of it. Each inquiry received a reply which denied at first any knowledge of the work and that it was not an official publication and was not recognized as having any authenticity. Actually, the Hawes Manual is an excellent reference to the policies in effect while Hawes was Principal Clerk of Surveys. Several of the same letters used in this book were printed in Hawes' Manual.

The *1867 Annual Report* indicated that after passage of the *Lode Mining Law* in 1866, the mineral States were organized into Mineral Districts by the Surveyors General. These were not miners' mining districts, they were simply geographic areas set up by the Surveyor General for filing and recording purposes, and appointment or commissioning of Mineral Surveyors. Nevada was organized into eight mineral districts; California was divided into nine districts.

On June 10, 1868, Commissioner Wilson issued *Circular No. 22,* detailing the process to be used in surveying small, unsurveyed islands which had been omitted in the original surveys. No change in policy was made; the islands were deemed public land subject to survey and disposal. The applicant had to deposit the money necessary to pay for the survey under the *Deposit Survey Law of May 30, 1862,* but received no rights to the island because of such payment. These instructions are given in the Appendix.

On July 13, 1868, L. M. Frierson of Booneville, Missouri, applied for the survey of an island in the Missouri River. Frierson alleged that the island had always been in existence but that at low water it was attached to the mainland which was patented. Wilson denied the application and ruled that the island inured to the riparian owner because of the accretion which caused the connection. This decision is indicative of the misunderstanding and confusion which prevailed with respect to riparian rights.

The *Act of July 25, 1868,* 15 Stat. 178, established the Territory of Wyoming. The territorial boundaries were the same as the present State boundaries.

On August 22, 1868, Wilson entered into a contract with and issued Special Instructions to Theodore H. Barrett, a surveyor from St. Cloud, Minnesota. Barrett was to survey the exterior boundaries, township and section lines, and subdivision of sections of the Sissiton and Warpeton Indian Reservation, located west of Lake Traverse in the Dakota Territory, now South Dakota. Barrett surveyed the exterior boundaries of the reservation first, then subdivided it into regular townships and sections of the Fifth Principal Meridian. Barrett then subdivided the sections into 40-acre allotments by the so-called "Three Mile Method", as instructed by the Commissioner, which simply means that he ran the north one-sixteenth line, the east-west centerline and south one-sixteenth line across the section (three miles total) and set the one-sixteenth section corners and center quarter corner at equidistant positions. None of the north-south lines through the section were surveyed. In every other respect the surveys were made in accordance with the public land laws on surveying.

This Three Mile Method of subdividing sections was used only on Indian reservations. All reservations subdivided into allotments were done by this method and variations of it until about 1920. When subdivided into 40-acre allotments, the one sixteenth corners were usually referred to as "1/8 corner." If subdivided into 20-acre allotments the one-sixty-fourth corners were usually called "1/32 corner." The Bureau of Indian Affairs (BIA) allotting agents devised a number and letter designation for the corners around the exterior boundaries and interior corners of a section. Fig. 45 is a sketch showing the system used to designate the corners and the lines surveyed. Fig. 46 is the plat of T. 119 N., R. 52 W., Fifth Principal Meridian, Dakota, as surveyed by Barrett.

Be aware that if interior corners of sections subdivided in this manner are now lost and are to be restored during a resurvey, they must be restored by proportionate measurement in the same manner that they were originally established, not by the rules of subdivision of sections as required by the 1973 Manual. More discussion of Indian allotments will appear as they occurred, especially after 1887.

On July 28, 1868, John A. Clark was commissioned Surveyor General of Utah and opened the office in Salt Lake City. Benjamin C. Cutler replaced Clark as Surveyor General at Santa Fe on August 26, 1868. But Clark only stayed in Salt Lake City until July 1869, at which time Courtland C. Clements took charge of the Utah office.

On November 18, 1868, Wilson replied to an inquiry from Silas Reed at Stanton, Missouri, on how to subdivide a section two. The north quarter corner of the section had not been established in the original survey and the north boundary of the township had double corners. Wilson advised Reed to survey the east-west centerline between the original quarter corners (normal) and run the north-south centerline due north from the south quarter corner to an intersection with the north boundary of the township and establish the north quarter corner at said point of intersection. Where the centerlines had been run and would intersect is where the center of the section would be established. Most other letters written in 1868 on the same subject received similar replies.

On December 24, 1868, in reply to W. P. Hobson of Savannah, Missouri, Wilson stated that whenever a meandered stream "entirely forsakes the former bed" then the land left exposed and the streambed were public land and subject to survey and sale. This was a case of avulsion of a stream, not the drying up (reliction) of a lake, and the expressed opinion was obviously contrary to law.

Wilson held very strong and somewhat biased opinions on riparian rights. The *1868 Annual Report* contains more than ten pages on riparian rights in which Wilson very strongly stresses his stand on the subject; it also indicates that dried-up lake surveys were made at cost to the applicant, the money was to be deposited before the survey would be ordered.

A letter dated March 11, 1869, addressed to Myron McLaren, Mt. Pleasant, Michigan, advised McLaren to establish the quarter-quarter (one-sixteenth) corners of sections against the north and west boundaries of the township (north one-sixteenth and west one-sixteenth) "at precisely 20 chains from the ¼ posts," placing the excess or deficiency in the last quarter mile. All others should be placed at equidistant posi-

tion between the quarter corners and section corners. Proportioning was not considered in that opinion.

In a letter to George W. Cooley of Minneapolis, Minnesota, dated March 25, 1869, Cooley was advised to establish the north quarter corner of a section two at midpoint between the closing corners at the northeast and northwest corners of the section. The east-west centerline should be run on true line between the east and west quarter corners. The north-south centerline was to be run due south from the established quarter corner on the north boundary to an intersection with the east-west centerline where the center quarter corner would be established. (Apparently the quarter corner of sections 2 and 11 did not exist—perhaps it was in a lake.) This was the first letter found that advocates the proper present-day method of establishing a north quarter corner between closing corners. Hawes' Manual judiciously avoided the subject.

During 1868 and 1869, an increasing number of letters arrived in the GLO from people complaining about County Surveyors and others who were moving the original quarter section corners from their original location to a position midpoint and on line between the section corners. In each reply, the Commissioner stated that the practice was objectionable and illegal, but that he had no jurisdiction over County Surveyors; he recommended that the complainant refer the matter to a court of competent jurisdiction. Most of this "corner moving" took place in the Plains States west of the Mississippi River.

On April 26, 1869, M. L. Stearns was notified of his appointment to be Surveyor General of Florida and was ordered to open his office in Tallahasse. In his *Annual Instructions* of June 22, 1868, Wilson told him to get the Surveyor General's records and Spanish Archives from the U.S. Attorney and go into business.

On June 8, 1869, John Lynch was notified of his appointment to be Surveyor General of Louisiana. His *Instructions* dated July 12th ordered him to open the office in New Orleans. Thus, the Florida and Louisiana offices were back in business after an eight-year hiatus due to the Civil War.

A letter dated July 21, 1869, to Jeremiah Stumm of Rushville, Illinois, directed him that to subdivide section 30, he should run the north-south centerline between original quarter corners and run the east-west centerline due west to an intersection with the west boundary where the west quarter corner would be established. The center quarter corner would thus be at the intersection of the centerlines.

A letter dated July 26, 1869, to Hiram Barney, in Menominee, Michigan, advised him on the proper method of subdividing a fractional section two, which contained a lake. Barney was to retrace the section lines to determine the variation of his compass, then run the east-west centerline east on a mean bearing to the lake and the north-south center north on a mean bearing to the lake. This was the first letter found during this period that introduced the concept of mean bearing over the due north, south, east, and west wording of the law.

In August 1869, the boundary survey of the Navajo Indian Reservation was begun by Ehud N. Darling under contract with Commissioner Wilson. Darling had surveyed the Colorado-New Mexico Boundary in 1867 and many other Indian reservations also. Darling designated the southeast corner of the Navajo Indian Reservation as the initial point of the Navajo Baseline and the east boundary was used as the reference meridian. The Navajo Reservation was surveyed and subdivided as a separate rectangular survey system in Arizona and New Mexico. The New Mexico portion of these surveys was cancelled by letter dated June 17, 1936. Officially, New Mexico is surveyed entirely on the New Mexico Principal Meridian system, whereas Arizona retains surveys on the Navajo Baseline.

On July 8, 1869, D. M. Chapman of Bushnell, Illinois, requested advice on the proper method of subdividing section 1, T. 5 N., R. 2 W., Fourth Principal Meridian. The reply dated September 6 instructed him to establish the one-sixteenth corners at midpoint between quarters corners and section corners, except the north one-sixteenth corners which were to be proportioned. He was to adjust his variation to retrace the section lines during that process; then run the east one-sixteenth line, north-south centerline, and west one-sixteenth lines due north to an intersection with the north boundary. Next, run the north one-sixteenth east-west centerline and south one-sixteenth lines across the section to the opposite corresponding corners. Where all of these lines intersected would be the position of the interior one-sixteenth corners and center quarter corner.

Several other letters during August and September sent to County Surveyors instructed them to restore lost section corners by single proportionate measurement on a "right line" between the found corners to the north and south of the missing section corners. Double proportioning was not mentioned as a proper method.

In the *1869 Annual Report,* Wilson mentions the survey of an avulsion of the Missouri River. The centerline of the abandoned channel had been surveyed and then the lands in the old bed had been surveyed and platted. He also reported that the Union Pacific and Central Pacific Railroads had hooked up at Promontory Point, Utah, on May 10, 1869, which would greatly increase settlement of the West and increase the need for surveys.

The *Act of February 2, 1870,* 16 Stat. 64, authorized appointment of a Surveyor General in Wyoming. Silas Reed from Missouri was appointed Surveyor General in March and established his office in Cheyenne. The first surveys in Wyoming were actually made by accident. In 1867, William Ashley had surveyed the Eighth Guide Meridian West under contract with the Surveyor General in Colorado. Ashley extended the guide meridian some three miles into Wyoming, thinking he was still in Colorado. The boundary between Colorado and Wyoming was not surveyed until 1873.

In June 1870, under a contract with Reed, Edwin James extended the Eighth Guide Meridian West northerly further into Wyoming. He also surveyed a portion of the Third Standard Parallel North, and the rectangular surveys in Wyoming were underway. All of the first surveys are numbered from the Sixth Principal Meridian, as are most surveys of the rectangular system in that State.

The *Act of May 4, 1870,* 16 Stat. 96, provided for a commission to revise the Statutes of the United States. After three years of work, the statute laws including the public land laws were codified and published as the Revised Statutes in 1874.

On May 21, 1870, a letter went to G. S. Killiam, County Surveyor, at Fort Dodge, Iowa, with regard to restoring lost

meander corners. Wilson stated that in the case cited by Killiam (not described), the proper method would be to run a straight line between the found section corners and restore the lost meander corners on that line at intersection with the banks of the river. This method would also be applicable in all similar cases; however, proportioning of the lost meander corners was not considered.

The following letter was a major break in the right direction in regard to corners on the north and west boundaries of the township, even though it wasn't abided by in later letters:

C. C. Carpenter, Esq.
Register of the State
Land Office
Des Moines, Iowa

Department of the Interior
General Land Office
May 26, 1870

Sir:

I am in receipt of your letter of the 18th instant desiring information in regard to the proper method of establishing the quarter corners on the northern tier of sections in a township where there is a double set of section corners on the township line. . .

In reply, I have to say that the quarter corners should be established at points equidistant between the N. E. and N. W. corners of the sections, *except* in section *six* where the quarter corner should be placed at precisely forty chains (original measurement) west of the N. E. corner of the section.

Very respectfully,
Your Obt. Servant
Jos. S. Wilson
Commissioner

The letter is simply stated and is of course the correct method to follow in most "normal" situations. Another letter dated May 31, 1870, sent to a surveyor in Illinois gave exactly the same rule for establishing the quarter corners on the west boundary of a township, which was also correct for a normal situation.

The matter of omitted lands between the meander line and actual shoreline and subsequent reliction came to a head in June 1870. In a letter to T. W. Ferry, Congressman from Michigan, Wilson described the situation:

Hon. T. W. Ferry
House of Representatives

General Land Office
June 10, 1870

Sir:

By reference to our letter, to you, of March 15th last, relating to the protest of Rev. H. C. Van Raalte, of Holland, Michigan, against the survey, by George Lander, of the same place, of a tract of alleged unsurveyed land in, what would be if surveyed, the S. W. frl. ¼ of Sec. 20, T. 5 N., R. 15 W. at the head of Black Lake, Michigan, who asks that an order issue to John F. Finkham, surveyor, of Grand Rapids, Michigan, for the proper survey of the same in order that it may be brought into market and sold according to law. I have the honor to say that additional evidence having been furnished by Mr. Van Raalte in reference to the case, this office is now prepared to examine the same, and submit the following: —

The N. W. frl. ¼ of Sec. 29, Tp. and Range aforesaid, was purchased at private entry in 1836, by Samuel McHyes and patented to him in 1839, and in 1847 was purchased by the Rev. H. C. Van Raalte.

It appears however, that during the progress of the resurvey of the City of Holland, located in the above named tract of land, in the year 1860, a small tract of alleged unsurveyed land was discovered in, what would be if surveyed, the S. W. ¼ of Sec. 20, immediately North of the tract purchased by Mr. Van Raalte, and between the government meander line and the water of the Lake.

Some time subsequent to the resurvey, the aforesaid George Lander, proposed to preempt this tract of alleged unsurveyed land and filed his application for survey of the same, in this office, September 3rd 1869, in regard to which, protest was entered by the Rev. H. C. Van Raalte upon the ground of riparian ownership.

The application for survey is accompanied by the affidavits of three persons, Civil Engineers, to the effect that the said tract of land is North of the government meander line — is high and dry land, from 1 to 15 feet above the level of the Lake — is of gravel formation on which the stumps of trees are yet standing, from 1 to 2 feet in diameter and that they are certain that no part of the high, dry land is accretion or could be so considered in any sense of the word.

It appears however, upon examination of the original field notes on file in this office, that, at the time of the survey, in 1832, no dry land was found between the meander line and the bed of the Lake: and, as the survey was made in the season when the waters of Lakes, and other bodies of water, are much higher than at ordinary stages, it is fair to presume that the survey was made in accordance with instructions from this office and in the proper manner, as certified by the Surveyor General.

Taking into consideration all of the facts in the case it appears that Mr. Van Raalte purchased all of the surveyed land in the N. W. frl. ¼ of Sec. 29, T. 5 N., R. 15 W., in good faith, and to the border of the Lake: and it would seem that his long and undisputed occupancy of the same as well as, his disposal of certain portions of it to different parties, including the supposed unsurveyed tract, ought to be protected against the uncertain tenure of subsequent claimants.

From all the evidence adduced in this case, it appears that the waters at the head of Black Lake have receded and formed into well defined channels, leaving a considerable tract of high and dry as well as swamp land South of what is now *Black River*, in the N. W. ¼ of Sec. 29, and S. W. ¼ of Sec. 20, T. 5 N., R. 15 W., so formed by the operation of natural or other causes, and it is now the policy of the government, under the recent *ruling* of the *Hon. Secretary* of the Interior in an analagous case, that when any *considerable* body of high land is formed in this manner, to have the lines of the public surveys extended over the premises.

Application for the survey of the same having been made by Mr. Landers, and John F. Finkham, Surveyor, of Grand Rapids, Mich., having made a proposition in writing specifying the amount for which he is willing to execute the survey and certificate of deposit having been made for the amount required with a U.S. Deposi-

tory to the credit of the U.S. on account of the appropriation for surveying the public lands, the Commissioner will forward at the earliest day practicable the necessary instructions for survey in accordance with the public land system.

Lands of this class when surveyed become subject to the operation of the homestead and preemption laws, or after due notice by the local land officers, pursuant to instructions from the Commissioner as contemplated by Sec. 5, Act of Aug. 3, 1846, may be sold for cash to the highest bidder and if not disposed of in this way will then become subject to private cash entry, warrant, or scrip location

I have the honor to be
Very respectfully
Jos. S. Wilson
Commissioner

Copies of the decision were sent to George Landers and the Rev. Van Raalte, but no "order" to Finkham was ever sent. In June 1871, (then) Senator Ferry again inquired about the matter. Willis Drummond replied that Lander must have misunderstood the decision (very understandable) and sent a copy of the decision to Lander. Lander then again requested the survey on September 4, 1871, but once again no order was issued. On February 14, 1872, in reply to another inquiry from Ferry, Drummond declined to order the survey. He explained that there were many cases pending before the Department in which the survey of lands, where the water had receded, were contested on the grounds of riparian rights. Drummond had recommended to the Committee on Public Lands that Congress pass legislation on the matter of dried-up lakes and relicted lands. Drummond thought that this class of lands should be granted to the States (similar to the swamp land grants). As far as can be determined, no survey was ever made, and there was no indication that Lander ever got his deposit back.

Oddly enough, in the above letter a policy change was made—to survey relicted land even though the water had not completely disappeared. The letter was also contrary to common sense. Wilson decides that Van Raalte had riparian rights to a small strip of omitted land, between the meander line and actual shore of the lake, but that he had no riparian rights to the relicted land in front of the old shoreline, even though there was water remaining, the Black River, which was a stream, not a lake.

One other item of interest seems appropriate at this time. Before any dried-up lake or island survey could be made, the applicant had to "prove" to the Commissioner that the application was legitimate, such as the fact the island was actually omitted and not formed by accretion or avulsion after the original survey, or that a lake was *all* dried up, not just partly so. To submit such proof, a map was frequently made by a local or County Surveyor at the request of the applicant, and this map would be sent to the Commissioner along with all of the affidavits. Nine times out of ten, the applicant would suggest that the survey be made by the Surveyor who made the map for him. If the Commissioner approved the application, he would then contract with the Surveyor for the "official" survey and field notes. In this manner a great many County Surveyors and others became "U.S. Deputy Surveyors" and that title carried considerable prestige among the local citizenry. If another application for an island survey was made in the same county by someone else, he would most likely hire the same "Deputy Surveyor" to make the map to accompany the application; this map would be nicely drawn, very similar to an official survey plat, and signed by "John A. Doe, Deputy Surveyor."

After examining all the evidence presented, the Commissioner might reject the application and often sent the materials submitted back to the applicant. Years later, the map, signed by "John A. Doe, Deputy Surveyor" would show up in some litigation as being a "plat" of the survey of the island, showing that so-and-so had title to it or at least color-of-title. Sometimes it takes an abnormal amount of research and digging to find out where these phony "plats" originated because the original parties are long dead, but when the origin is found, it can settle a dispute in short order; the main clue is that these "plats" were not approved by the Commissioner or a Surveyor General. Also, do not be confused by a marginal notation such as "Rec'd with Sur. Gen'ls letter, June 10, 1873."

The *Act of July 9, 1870,* 16 Stat. 217, added sections 12 thru 17 to the *Mining Act of July 26, 1866.* By this act, placer claims were added to the mining law. Placer claims could not exceed 160 acres, were to conform to the rectangular surveys, could be legal subdivisions of 40 acres, or in 10-acre aliquot parts. Sec. 16 of this act repealed part of the *Act of March 3, 1853,* and directed that the rectangular system should extend over all public lands, regardless of their mineral content, but that "waste or useless lands" were not to be surveyed.

Sec. 16 concludes with these words and is now codified in *43 U.S.C. 766:*

> "Provided, That all subdividing of surveyed lands into lots less than one hundred and sixty acres may be done by county and local surveyors at the expense of the claimants: And provided further, That nothing herein contained shall require the survey of waste or useless lands."

This act officially allowed county and local surveyors to subdivide public lands, when in actual practice they had been subdividing sections since before 1830. It isn't known when the "District Surveyors" had ceased being appointed by the Surveyors General. This act actually gave official notice of something that had been routine for a long time, and especially so after 1853.

The stipulation that wastelands not be surveyed caused further "piecemeal" township surveys. Many townships in the West are incomplete because of this elimination of "waste or useless lands" from the regular extension of the rectangular system.

By the *Act of July 11, 1870,* 16 Stat. 230, Arizona was made a separate surveying district. John Wasson was commissioned Surveyor General on July 12 but notification did not reach him until November 5, 1870, when he opened his office in Tucson. He travelled to California, brought back the Arizona records, and began contracting for surveys in that territory in March 1871.

On July 25, 1870, the Secretary of the Interior contracted with Ehud N. Darling and Theodore H. Barrett for the survey of the Chickasaw lands in the Indian Territory (now Oklaho-

ma) in accordance with the *Treaty of April 28, 1866,* concluded with the Choctaw and Chickasaw Indians, which required that the lands be surveyed and subdivided into 160-acre tracts.

On July 30, 1870, Wilson issued *Special Instructions* for the surveys. Darling was assigned to survey the Indian Meridian and the Baseline in the eastern part of the Chickasaw lands; Barrett was to survey the baseline in the western part. As instructed, Darling established the initial point between two small streams a short distance southeast of Fort Arbuckle, which he monumented with a marked stone. Darling then surveyed the baseline east to the boundary between the Chickasaws and Choctaws. He surveyed the Choctaw-Chickasaw boundary north to the Canadian River starting at the confluence of Island Bayou and the Red River, and the meridian between the Red and Canadian Rivers. He surveyed his area into townships and sections, then subdivided the sections by running the centerlines between quarter corners, establishing the center quarter section corners at the intersection of centerlines.

Barrett surveyed the baseline west to 98° west longitude, then subdivided the western part of the Chickasaw lands the same as Darling did the eastern half. Barrett found gross errors in the 1858 survey of the 98th Meridian, which had been surveyed as the west boundary of the Chickasaw lands; he did that work over so he could close against the boundary.

This was the first time found in which a "complete" survey was made of the sections from the establishment of the initial point through to the proper method of subdividing the sections into quarter sections. It was not done on public lands because Indian reservations were not "public lands" under the land laws.

In December 1870, Darling and Barrett were given contracts to survey the Indian lands between the 96th and 98th Meridians from the Canadian River north to the Kansas boundary; the Indian Territory surveys were under way.

To illustrate the inconsistency going out of the GLO at the time, the following letters are mentioned.

On August 22, 1870, H. W. Dickson, of Hillsboro, Illinois, asked advice in subdividing section 6, T. 7 N., R. 3 W., Third Principal Meridian, a normal section (not fractional). Dickson wanted to establish the north quarter corner 40 chains west of the northeast corner and the west quarter corner 40 chains north of the southwest corner of section 6, then run the centerlines accordingly. Wilson told him on August 31 that method was wrong; instead he should run due north from the South quarter corner and due west from the east quarter corner to an intersection with the exterior boundaries; where the lines crossed would be the legal center of the section.

On November 5, 1870, J. D. Carleton, of Port Huron, Michigan, was instructed to subdivide a fractional section by running from the estabished quarter section corners due north, south, east or west, as the case may be, to the water boundary, without regard to the direction of the original section lines.

On November 9, 1870, E. C. Martin, of Pontiac, Michigan, was instructed to set the north quarter corner of a section 6, exactly 40 chains west of the northeast corner of section 6, even though the original plat returned the length of the north boundary of section 6 as 80.50 chains and Martin had found it to measure only 69.30 chains.

Also on November 9, 1870, E. C. Hutchinson, of St. Louis, Missouri, was instructed to establish the north quarter corner of section 4 by running due north from the quarter corner of sections 4 and 9 to an intersection with the north boundary of the section.

On February 4, 1871, Willis Drummond was appointed Commissioner of the GLO. Generally speaking, Drummond continued Wilson's policies in regard to corner restorations but changed the policy on subdivision of sections and dried-up lakes.

The *Act of February 18, 1871,* 16 Stat. 416, ceded to the State of Ohio all of the unsold and unsurveyed lands in the Virginia Military Tract. No attempt was made to identify the lands ceded.

On February 27, 1871, the Surveyor General of Minnesota was instructed to have the sections in the White Earth Indian Reservation subdivided by the Three Mile Method and mark the quarter-quarter section corners "1/16."

The *Act of March 3, 1871,* 16 Stat. 581, added Sec. 11 to the deposit survey part of the *Act of May 30, 1862,* 12 Stat. 409. This section follows:

> "Sec. 11. And be it further enacted, That in all cases where settlers shall make deposits in accordance with this act, to the credit of the United States, for public surveys, such amounts so deposited shall go in part payment for their lands situated in the townships, and the surveying of which is paid for out of said deposits and effect shall be given to this act by regulations to be prescribed by the commissioner of the general land office."
>
> APPROVED, March 3, 1871

Very few "deposit surveys" had been made of townships and sections under the 1862 act because the cost of survey was in addition to the cost of the land. This amendment greatly increased deposit surveys because the deposits were actually a credit account toward land payment when patent issued. But the credit or deposit could only be used for land in the township applied for; it could not be used elsewhere and was not refundable if the depositor changed his mind and moved elsewhere. The whole deposit survey idea was an economy measure (at least to the well intentioned) in which the settlers put up the "front money" for the surveys instead of using appropriations from the Treasury, but the cost of survey for a whole township was too great for only one or two settlers to bear. Then too, the "waste and useless lands, unfit for cultivation" were not supposed to be surveyed, so many of the deposit surveys at this stage were made of only the "good parts" of the township, which reduced the cost and made the surveying easier for the contracting deputies. That left many townships only partly done and compounded the problem of "completion" surveys in later years. The Western States, especially Nevada and Utah, had many fragmentary surveys executed in the early 1870's.

On March 13, 1871, Drummond replied to John Taffe, a member of Congress, who stated that Carl Meyer of Yankton, South Dakota, had invented a metal "Surveyor's Mark." Taffe wanted it used in monumenting the public surveys. Cast iron monuments had been used on State boundaries and other special situations but not as a general practice in monumenting the public land surveys. Many corners in the Plains States and western deserts disappeared almost before

the surveyor got out of sight, so the argument for a metal monument was sound enough. Drummond declined the suggestion on the grounds of cost, procurement, freight, and burden to the surveyors.

In letters dated March 18, 1871, to Theodore W. Robbins, Big Rapids, Michigan, and to Asa H. Guy, County Surveyor, Georgetown, Illinois, they were directed to establish the quarter corners along the north and west boundaries of the townships at midpoint between the controlling section corners except section 6. This reversed the due north and due west method propounded in November only four months earlier.

On March 27, 1871, W. McChesney, Sagetown, Illinois, was advised to establish the west quarter corner and north quarter corner of a section 6, at 40 chains "original measure" (proportioned) north of the southwest corner and west of the northeast corner of the section, which is basically the same method used today.

In the late 1860's and early 1870's, including Drummond's administration, the surveyors were usually advised to restore obliterated monuments at the intersection of record bearings, when the record bearings and distances to found original bearing trees did not match.

On May 6, 1871, Drummond issued a *Circular* to all Surveyors General, detailing the procedures, estimating, and accounts for deposit surveys. These instructions did not affect any methods or procedures in the field execution of the rectangular surveys, except as already noted.

The following letter on how to subdivide a section describes the method used to the present day:

S.M. Delamaker, Esq. Department of the Interior
Logansport, Indiana General Land Office
Washington, D.C.June 23, 1871

Sir:

Your letter of the 15th instant addressed to the Hon. Secretary of the Interior, requesting information in regard to the proper manner of subdividing a full section of the public lands into quarter-quarters, has been referred to this office.

In reply I have to say that the sections should be first subdivided into quarters by running *straight lines* from the quarter corners to the opposite corresponding corners. The point of intersection of these lines will be the corner common to the several quarter sections.

To subdivide the quarter sections, quarter-quarter corners should be placed at points *equidistant,* on straight lines, between the corners already established, and each quarter subdivided by running straight lines from these quarter-quarter corners to the opposite corresponding corners, establishing the common center at the intersection of the lines so run.

Very Respectfully
Willis Drummond
Commissioner

On October 3, 1871, Edgar Henry, Monticello, Indiana, was advised that to restore the lost corner of sections 3 and 4 on the north boundary of a township, he should run due north from the original quarter corner of sections 3 and 4 and establish the lost closing corner at the point of intersection.

On November 11, 1871, S. J. Carter, Deputy County Surveyor, Brunswick, Missouri, was instructed to restore lost section corners at single proportionate distance on straight line between found corners to the north and south, and run the east-west section lines straight between the section corners thus restored, placing those quarter corners at midpoint. Drummond used that policy of restoring lost section corners throughout his tenure in office.

In the *1871 Annual Report,* Drummond reported that the Nez Perce Indian Reservation in Idaho had been partially subdivided into 20-acre allotments. Many other Indian reservations (too many to name here) had been subdivided into 20-, 40- and 80-acre allotments, all done by the Three Mile Method. Fig. 47 indicates the method used to subdivide a section into 20-acre allotments and to number the "lots."

Variations of this basic system were used in the different surveying districts. An example is shown by Fig. 48, a sketch taken from the *Special Instructions, Contract No. 381,* Washington, dated in 1892. In that contract, the Deputy Surveyor was instructed to mark the monuments and bearing trees as lot corners instead of the usual one-eighth or one-thirty second corner designations.

The following letter will indicate the policy generally adopted in dealing with meander corners:

Geo. W. Cooley, Esq. Department of the Interior
U.S. Deputy Surveyor General Land Office
Minneapolis, Minnsota Washington, D.C.
Sir: January 3, 1872

I am in receipt of your letter of the 23rd Ult. making inquiries concerning the re-establishment of the meander corners on the 4th Standard Parallel in Secs. 31 and 32, Tp. 117 N., R. 21 W., 5th P.M., Minn. and stating that the bearing trees on the west side of the lake do not agree with the field notes.

In reply I have to state that it will be necessary to re-establish the section corner to sections 31 and 32 on the Standard Parallel equidistant between the Southeast corner of Section 32 and the Southwest corner of Section 31 and establish the meander corner on the east side of the lake on the thus established Standard at a distance proportionate to the original measurement.

The meander corner on the west side of said lake should be similarly established, giving due weight to the position of the bearing trees which you have found standing.

Very Respectfully
Your Obt Servant
Willis Drummond
Commissioner

As a general statement, meander corners were not used as a basis of proportioning lost section or quarter-section corners or other meander corners. They were treated in much the same manner as line trees, controlling the direction of a line but not the proportioning along the line. No explanation of that philosophy was found; as will be seen, it was not a hard and fast rule; exceptions were made.

In January 1872, R. C. Hathaway, County Surveyor, Oconomowoc, Wisconsin, sent a survey "plat" and application for 15.69 acres of omitted land lying between the meander line and actual shoreline of "Lake LaBelle," in the northeast

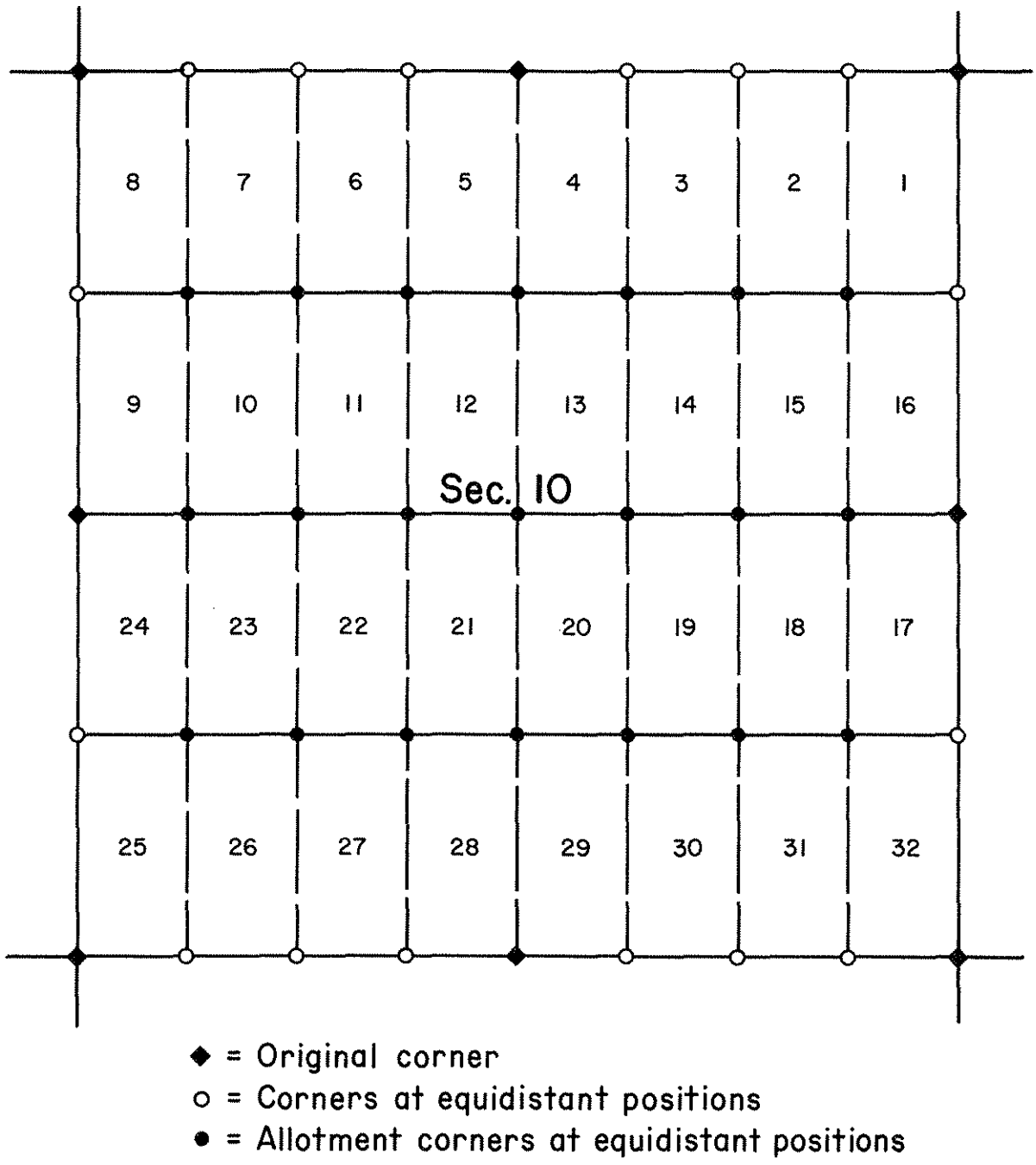


Figure 47. Method of Subdividing Sections on Indian Reservations.

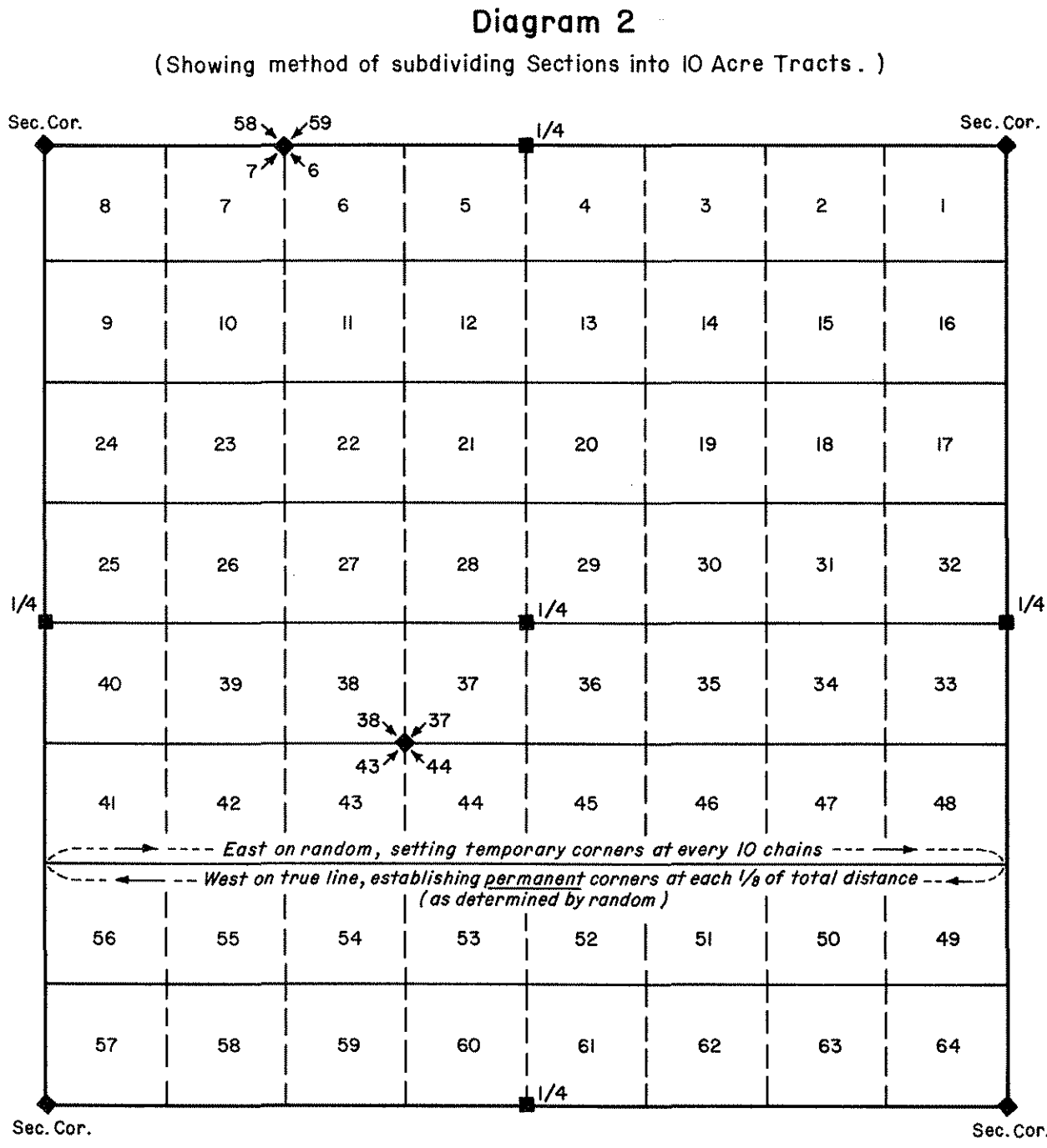


Figure 48. From Special Instructions, Contract 381, Washington — Makah Indian Reservation.

quarter of section 30, T. 8 N., R. 17 E., Fourth Principal Meridian. Hathaway wanted to purchase the land. Drummond bluntly rejected the application, said the survey by Hathaway was illegal, and that the government would not survey such small parcels of land until such time as the lake entirely dried up. (The whole lake covered over two sections of area.)

The following letter is of special interest:

Department of the Interior
General Land Office
Washington, D.C., Feby 15, 1872

Hon. H. C. Burchard
House of Representatives
Sir:

I have the honor to acknowledge the receipt, by reference from you, of a letter from Mr. M. Montelins dated Cedarville, Stephenson County, Illinois, 29th ultimo, desiring information in regard to the proper method of establishing the centers of sections, and in reply, I have to say as follows: —

This office has not authority to *issue instructions* for the subdivisions of lands which have been disposed of by the government and when called upon for an opinion in the matter, can only point out the manner in which the law requires said subdivisions to be made.

Under the provisions of the *Act of Congress, approved February 11, 1805,* the course to be pursued in subdivision of Sections is to run straight lines from the established quarter section corners — U.S. Surveys — to the opposite corresponding corners, and the *point of intersection* of these lines will be the *corner common to the several quarter sections.*

The "Instructions to the Deputy Surveyors of the United States for the District of Illinois and Missouri", issued in the year 1856, contains directions for the subdivision of Sections, which, though not in strict accordance with the requirements of the Act above referred to, is the method which has been adopted by many County Surveyors in Illinois.

In some cases the Surveyor General Subdivided the Sections upon the original plats by the rule laid down in said "Instructions" and the lands have been sold according to such subdivision.

Many purchasers of lands subdivided upon the plats by the Surveyor General, or subdivided by County Surveyors according to the rule given in the "Instructions" have held possession for many years, and have fenced their lands and made other improvements in such manner that, a change in the lines, in order to make them conform to the strict letter of the law, would often work great hardship and it has been the policy of this office, to recommend in such cases the maintenance of the subdivision lines as established in the field.

Mr. M's. letter to you is herewith returned.

I am Sir
Very Respectfully
your Obt Servant
Willis Drummond
Commissioner

So far as is known, this policy on "instructions for the subdivisions of lands" is still in force today in the BLM. The opinion expressed with regard to the 1856 Instructions is also abided by if and when any public lands are affected by those improperly executed section subdivisions. The BLM does not presume to tell anyone what they should or should not do on privately owned lands not affecting public lands. Any opinions expressed are still an opinion and advisory only.

The *Act of March 1, 1872,* 17 Stat. 32, created Yellowstone National Park, the first of the national parks. The boundaries of the parks were surveyed by the GLO.

On May 1, 1872, Drummond replied to M. J. Alexander of Marshall, Missouri, in regard to establishing the north quarter corner of section 2, T. 50 N., R. 21 W., Fifth Principal Meridian. The original plat showed that the subject quarter corner had been theoretically established or protracted at a point 39.11 chains west of the northeast corner and 41.19 chains east of the northwest corner of the section. Alexander was advised to establish it in that position by proportionate measurement to protect the subdivisions shown on the original plat, which is the same policy used today.

The *Act of May 10, 1872,* 17 Stat. 91, is the general *Mining Law,* still in effect—the basis of the mineral surveys made on the public lands. Although mineral surveys are not made by employees of the BLM, mineral surveyors are appointed by the BLM. While executing a mineral survey, the surveyors are technically government employees but their fees are paid by the claimant. A mineral surveyor acts in about the same capacity as did the "District Surveyors" appointed by Jared Mansfield in Ohio.

The *1872 Mining Law* covers both lode and placer claims and millsites. Lode claims are surveyed, usually without regard to the rectangular system, though they are usually tied to a rectangular corner; they are then segregated out of the sections in which they are located, leaving many odd-shaped fractional lots. Millsites are usually surveyed in a similar manner. Placer claims are now usually taken by legal subdivision or aliquot parts of legal subdivisions of a section, although thousands of "gulch" placers were also surveyed.

The BLM issues orders for mineral surveys and approves the field notes and constructs the mineral survey plats. Field surveyors are often confronted with the Dependent Resurvey of mining claims but not the original survey. Mining claims themselves have no influence on the system and extension of the rectangular surveys. An unsurveyed but marked mining claim location may be segregated from unentered public lands for administrative purposes.

On September 3, 1872, Drummond entered into a contract with and issued *Special Instructions* to Orrin T. Morrill, U.S. Surveyor, for the survey of township boundaries, section lines, and section subdivisions on the Pottawatomie Indian Reservation in the Indian Territory. The east boundary of the reservation had been surveyed in 1871 by Nathaniel Robbins as the west boundary of the Seminole Reservation. The north boundary of the Pottawatomie was the north fork of the Canadian River; the south boundary was the Canadian River. The west boundary was in the late stages of being surveyed by Barrett and Darling, who were also surveying the Second Standard Parallel North through the approximate center of the Pottawatomie Reservation, running east from the Indian Meridian.

Morrill was instructed to survey the Pottawatomie lands using the Second Standard Parallel as an "auxiliary" baseline for his work. The following paragraph from the *Special Instructions* are given verbatim:

> "The Second Standard Parallel is coincident with the line between townships eight and nine North of the Base line, it will serve you as an auxiliary base for running your district into townships lying both North and South thereform; you will close your meridional lines starting from the parallel *North* from the Standard corners and *South* from the closing corners which you will have established at proper convergency of the meridians."

Morrill was to subdivide the sections into 40-acre tracts using the Three Mile Method of subdividing sections. To accomplish that, he had to establish one-sixteenth section corners at equidistant positions between the section and quarter-section corners. Morrill was instructed to retrace the Second Standard Parallel, which had already been surveyed, and establish the one-sixteenth corners thereon, as shown on a diagram accompanying his Special Instructions.

Morrill had to retrace the Standard to set not only the one-sixteenth corners, but also the "closing corners" for the townships and sections to the south of the standard. This process was not dissimilar from that used on standard parallels, south of the baseline, under the *1851 Oregon Manual.* But the closing corners established in that manner, even though called "closing corners", are not in fact true closing corners. They are generally treated today as junior corners supposedly established on a senior line. Morrill ran south from them to the Canadian River. The Barrett-Darling survey of the Second Standard Parallel was a senior survey but would not have resulted in an approved plat, per se. The Standard Parallel was probably approved as part of the plats of the surveys of the townships as returned by Morrill. Therefore, if the presumption is true, both the standard corners and the junior corners established by Morrill would control alignment and distance along the Standard Parallel in any subsequent dependent resurvey. The field notes and plats would have to be carefully examined to establish the true status of the corners along that line.

On November 3, 1872, Morrill was instructed to write the field notes of his work in accordance with specimen field notes sent to him of the Warpeton and Sissiton Reservation in Dakota. As previously noted, that reservation was the first one subdivided by the Three Mile Method.

The *Act of February 18, 1873,* 17 Stat. 465, declared that the coal lands, and iron ore lands in Michigan, Wisconsin, and Minnesota were not subject to the *1872 Mining Law.*

In a letter to John Melendy, County Surveyor, Shawnee, Wisconsin, dated July 12, 1873, Melendy was advised to restore the lost quarter corner on the east boundary of section 24, T. 27 N., R. 15 E., Fourth Principal Meridian, at proportionate distance between the found original meander corner to the north and the original southeast corner of section 24. Thus, the meander corner was used to control the restoration of the lost quarter corner. A nearly identical letter went to a man in Kansas on June 5, 1877. This advice was a reversal of the opinion expressed to George Cooley on January 3, 1872.

The following letter concerned the proper method of subdividing a section 2:

Department of the Interior
General Land Office
Washington, D.C., Sept. 12, 1873

Frank Dorr
Waupaca, Wisconsin

Sir:

In reply to your letter of the 1st instant, relative to the proper manner of establishing the quarter-quarter corner north of the centre of Section 2, T. 24 N., R. 14 E., 4th P.M., Wisconsin, I have to say as follows:—
The said corner should be established at a distance of *twenty chains original measurement* north of the centre of the section—This rule will, of course, necessitate the adoption of a proportional measurement if the chaining does not agree with the original distance.
The *original* length of the quarter line from the center of the section to the township line is the *mean* between the lengths of the East and West boundaries of the *North half* of the section or 45.85 chains, this being the length adopted in calculating the areas of the lots in said section.
My letter of the 30th January, 1872, relative to the S. E. ¼ of the N. W. ¼ of said section 2, addressed to Mr. E. P. Perry, was based upon the presumption that the County Surveyor's chain was of the same length as that of the U.S. Deputy Surveyor.

Very Respectfully
Willis Drummond
Commissioner

Frank Dorr was the County Surveyor. E. P. Perry was the owner of the SE ¼, NW ¼, section 2. The distance from the center quarter corner to the north quarter corner was 44.00 chains by Dorr's measurement. When proportioned, the center-north one-sixteenth was 0.81 chains south of a full 20 chains, which "deprived" Perry of land that he had "improved and rendered valuable." Perry retained a law firm to represent him in the dispute; they wrote to the Commissioner on November 28, 1873, for an explanation. Drummond replied on December 5, 1873, and stuck by his above decision.

This exchange established the principle of subdividing sections against the north and west boundaries to suit the areas as calculated on the original plat.

A somewhat similar but different problem came up at this same time. On November 22, 1872, M. J. Alexander, Marshall, Missouri, had this situation: in the original survey of T. 51 N., R. 19 W., Fifth Principal Meridian, the length of the south boundaries of sections 1, 12, 13, 24, and 25 had been returned as something greater than 81 chains in length, possibly 81.50 chains. That length was "out of limits;" it may have been caused by a crooked east boundary. (See subject of letter to Charles E. Morse, July 28, 1847, in Arkansas.) However, the original surveyor had placed the quarter section corners at midpoint in the field and returned them as such in the field notes. But in constructing the plat of the township, the draftsman had shown the quarter corners to be at 40 chains from the west and had placed all of the excess in the east half of the sections in calculating the areas. Apparently the quarter corners were lost and needed restor-

ing and Alexander was to subdivide those sections. He wanted to know what controlled, the plat or the field notes? Drummond advised him that the field notes controlled; the corners would have to be at equidistant points and the sections subdivided accordingly. Apparently there were no lots along the east boundary, just quarter sections containing more than 160 acres shown on the plat.

If confronted with that problem today, and if the east halves of the sections had been protracted into lots against the east boundary, the BLM would also restore the quarter corners at midpoint if lost, but would then establish the east one-sixteenth section corners in a position proportionate to the distances used to calculate the areas on the plat.

On *February 19, 1873,* 18 Stat. 16, Congress passed a special act, granting to Holt County, Missouri, for school purposes, the former bed of Tarkio Lake, located in the east half of T. 60 N.,R. 39 W., Fifth Principal Meridian. The lake had been meandered during the original survey in 1846. The county court designated Stephen C. Collins as a competent surveyor to execute the survey of the dried-up lake. On March 19, 1874, Drummond issued *Special Instructions* to Collins for the survey, which was to simply extend the section lines out from the meander corners, a normal completion survey. The survey of Tarkio Lake was approved June 26, 1874.

Tarkio Lake was a dried-up, meandered lake, and the lands bordering it had been patented. The government claimed ownership through the long-standing policy on dried up lakes, but dried-up lake surveys had been on a back burner since at least January 1872 (as indicated in the Black Lake case). By granting Tarkio Lake to Holt County, Congress was giving tacit recognition to government ownership of relicted lake beds, or at least that is how the Commissioner reacted to the act. More dried-up lake surveys followed.

In a letter dated March 23, 1874, Drummond advised F. Marky, the County Surveyor in Chillicothe, Missouri, to restore the northeast corner of section 4, T. 56 N., R. 25 W., Fifth Principal Meridian, by double proportion. When Marky restored the corners along the north boundary of the township on a straight line between found corners, the distance from the found quarter corner of sections 4 and 5, to the restored township line was very short, but the distance to the next found corner to the north was too long. Drummond advised him to restore the corners along the township line by proportion (east-west) but to determine the alignment of the township line by proportioning between found original corners to the north and south. This method is still provided for in the 1973 Manual, Sec. 5-37, in special cases, with conclusive proof.

In a letter to "Hunter and Page," Chicago, Illinois, dated March 24, 1874, in regard to the proper method of establishing the north quarter corner of section 6, T. 38 N., R. 12 E., Third Principal Meridian, they were advised to establish the corner at a point which would "suit the areas expressed on the official plat" at proportionate distance between the northeast and northwest corners of the section. (This opinion was corrected on April 18, 1874, for other reasons.)

In a letter dated April 14, 1874, sent to P.M. Brown, the County Surveyor in Smith's Creek, Michigan, in regard to establishing quarter corners along the west boundary of a township, the phrase "should be placed at the points indicated by the calculation of the areas of the quarter sections adjoining the range line" was used. These two phrases, identical in meaning, were used increasingly from then on when replying to similar inquiries. They have evolved over the years to the often-used phrase "protect the plat."

On July 1, 1874, Samuel S. Burdett became Commissioner of the GLO.

The following letter had to do with "off-line" closing corners:

Charles J. Wright
Deputy Co. Surveyor
Fergus Falls, Minn.

Department of the Interior
General Land Office
Washington, D.C.,
June 24, 1874

Sir: In reply to your letter of the 13th instant, alleging that the closing corners on the Standard Parallel between Tps. 132 and 133 N., R. 41 W., 5th P.M. are from two to four rods north of the Standard, I have to say that an examination of the field notes and plats in this office does not verify your statement, but in any event the *Standard Parallel* must be considered the *true boundary* between the townships referred to.

Very Respectfully
W. W. Curtis
Acting Commissioner

This policy on "off-line" closing corners has never wavered.

On July 13, 1874, Burdett issued a *Circular* (see Appendix) on policy in regard to the survey of the beds of dried-up lakes. Such lake beds or relicted lands along the shore, exceeding 40 acres, would be surveyed at the expense of the applicant, with a deposit, with the necessary proofs.

The Wolf Lake-George Lake situation became active in September 1874. On September 2, Burdett wrote to J. H. Hardin, Chicago, Illinois, concerning the navigability of Wolf Lake located in fractional T. 37 N., R. 15 E., Third Principal Meridian, Illinois. The original survey had been made in 1834 and 1835 and had meandered a lake shown as "Navigable Lake" on the plat. Lands bordering the lake had been patented in 1841. Lake George was part of the same lake but was located in T. 37 N., R. 9 W., and T. 38 N., Rs. 9 and 10 W., Second Principal Meridian, Indiana. (The state boundary crossed the lake.) Apparently the lake had receded and claims were being made on the relicted lands. Burdett correctly told Hardin that just because the plat called it a "Navigable Lake," that label didn't make it navigable in fact.

Also on September 2, Burdett issued instructions to Elisha S. Bennet of La Porte, Indiana, to investigate the conditions of the lake and make a report on the matter, basically as required by the *Circular of July 13*. Bennet must have made a rapid investigation because on September 8, 1874, *Special Instructions* went to Alexander Wolcott, County Surveyor, Cook County, Chicago, Illinois, instructing him to extend the lines of the public surveys over Wolf Lake, which Wolcott did. In letters to Hardin and others on November 30, 1874, Burdett informed them that the survey by Wolcott had been approved by him on November 28. The plats were sent to the land office on January 7, 1875. In 1875, George Lake on the Indiana side was also surveyed and approved January 12, 1876. Hardin and others protested the surveys to the Secre-

tary, who upheld the survey. At some later date, the government patented part of the surveyed relicted lands in Wolf Lake to Conrad Jordan and another part to Jabez G. Smale. Hardin sued on grounds of riparian rights, as did Charles H. Mitchell, another upland owner, and the whole matter entered the judicial process. (The Pistakee Lake case, in Lake County, Illinois, was hot at the same time and involved similar circumstances.)

The *Hardin vs. Jordan* case first went to court in 1883, and Hardin's claim to the lake bed based on riparian rights was upheld. The case went through the appeals process and came before the U.S. Supreme Court in January 1891. The Supreme Court rendered a lengthy decision on May 11, 1891 (see *Hardin vs. Jordan,* 140 U.S. 371) and ruled that Hardin did have riparian rights to the relicted lands in Wolf Lake.

The *Mitchell vs. Smale* case (140 U.S. 406) was argued before the Supreme Court at the same time. The only difference was that the original meander line of 1834 — 1835 had cut off a small tongue of land projecting out into the lake; this narrow strip of omitted land was quite small in area. The court ruled that this small area did not deprive Mitchell of his riparian rights to the lake. This decision (by which the area of the omitted land is judged in relation to the area of upland lots patented) is still the basic test used by the BLM to determine whether lands are omitted and therefore subject to survey. But a later case was more clear on the subject.

This was 1874 and the final decisions weren't made until 1891; business had to go on in the interim.

On October 30, 1874, N. P. Stilson, Jefferson, Iowa, wrote to the Secretary of the Interior, requesting advice on establishing the quarter section corner of sections 2 and 11, T. 83 N., R. 30 W., Fifth Principal Meridian. The original surveyor, in running the line between sections 2 and 11, had set a witness corner at 34.92 chains, a second witness corner at 50.38 chains, with a total length of the line as 79.76 chains. Both witness corners were found, as were the section corners. Where should the quarter corner be established? Burdett replied on November 14 that Stilson should establish the quarter corner on line between the witness corners but at midpoint between the section corners. Proportioning between the witness corners was not considered by Burdett.

The *1874 Annual Report* contained long lists and publications of the many Departmental decisions and decisions of the GLO concerning the public lands, mining claims, and private land claims. The Annual Report was being used to publish those decisions much in the same manner as the Land Decisions (LD's) and Interior Decisions (ID's) which came later. This practice continued in the annual reports for subsequent years.

The 1874 report also indicated that Charles F. Smith, Deputy Surveyor, had nearly completed the rectangular surveys of the Florida Keys. Smith had started that project in 1872 and apparently completed the work in 1876.

In a letter dated January 23, 1875, Andrew Porter, Petoskey, Michigan, was advised that to subdivide fractional section 6, T. 34 N., R. 5 W., Michigan, made fractional by Little Traverse Bay, he should run the east-west centerline between quarter corners, and to run the north-south centerline from the quarter corner of sections 6 and 7, north, "parallel with the east boundary of the section, to the Bay." This was another step away from the due north doctrine.

On February 17, 1875, a letter was sent to M. P. Brittain, County Surveyor, Summit, Alabama, in response to his request regarding the proper method of subdividing sections. The letter was practically verbatim the instructions issued as a Circular on November 1, 1879, under the heading "Subdivision of Sections." In response to similar inquiries during ensuing years, the letter to Brittain was copied verbatim until issuance of the 1879 Circular.

The *Act of March 3, 1875,* 18 Stat. 366, provided for the closing of the Office of Surveyor General of Kansas. The office at Lawrence, Kansas, was closed June 30, 1876, and the records turned over to the State. Thus, in just 21 years (a rapid rate) the State of Kansas had been surveyed. But, already a large percentage of the corners were obliterated and resurveys would be necessary.

In one of the numerous letters to Hiram W. Barney, Wonewoc, Wisconsin (this one dated March 8, 1875), the "instructions" to Brittain on subdividing sections were extended to include the "anomalous" or elongated sections in a township. The quarter-quarter corners on the centerlines were to be established at proportionate positions to suit "the calculation of the areas expressed on the plats," adopting mean lengths.

On April 12, 1875, C. W. Shoemaker, Surveyor in Waterville, Ohio, requested advice on establishing the west one-sixteenth corner between sections 6 and 7, T. 7 N., R. 8 E., First Principal Meridian, Ohio. He had found the original quarter corner, but the closing corner (double corners along the range line) of sections 6 and 7 was off-line. Where would the one-sixteenth corner be placed? Did the off-line closing corner control or the true range line? Burdett advised him on April 22 that the off-line closing corner controlled the proportionate position of the west one-sixteenth corner (i.e., it controlled the original measurement) but did not control the direction of the range line. The true southwest corner of section 6 would be at the true point of intersection of the lines. As far as it can be determined, this principle has never been abrogated by any opinions or decisions of the GLO and BLM, nor by any known court decision.

In the *Annual Instructions* of April 14, 1875, the Surveyors General were instructed to direct their deputies to build mounds of earth and dig pits at all corners monumented with stones. These instructions were later referred to as a circular. The method is shown in the 1881 Manual (Diagram C, sheet 1; see Appendix).

On June 28, 1875, M. S. McCord, County Surveyor in Nashville, Illinois, sent copies of "rules for the Subdivision of Sections" which McCord said had been "issued by the Secretary of State of Michigan, with the approval of the GLO." McCord asked if these rules were indeed in accordance with the view of the GLO. Burdett replied on July 6, 1875, that the rules were "in the main, correct," but went on to give the "following approved rules for the Subdivision of Sections and the restoration of lost corners." The rules that followed were the complete Circular issued on November 1, 1879; it was actually in effect nearly three and one-half years before the formal issuance. It did, of course, propound the single proportion north-south policy of restoring lost section corners, which had been in effect since the early 1860's, and would remain so until 1882.

On July 7, 1875, James S. Miller, U.S. Surveyor under a contract with Commissioner Burdett, dated October 2, 1874,

established the initial point of the Wind River Meridian and Baseline in Wyoming, which was established to control the surveys in the Shoshone Indian Reservation. Miller surveyed the exterior boundaries, township, and subdivisional lines. This system of surveys covers a small area in west-central Wyoming; the remainder of the State is surveyed with reference to the Sixth Principal Meridian.

On August 30, 1875, Charles L. Dubois, a Deputy Surveyor under a contract dated August 12, 1875, with the Surveyor General of Utah, established the initial point of the Uintah Meridian and Baseline, a meridian set up for the surveys in the Uintah Indian Reservation. Dubois had executed many of the surveys in the Indian Territory. The rectangular surveys, based on this initial point, are confined to a relatively small area in the northeastern part of Utah.

In the *1875 Annual Report,* Commissioner Burdett reported that the GLO had been organized into 11 separate divisions, each identified by a letter of the alphabet. The divisions, assigned different duties and responsibilities in the operations of the GLO, were as follows:

Division

A — Chief Clerk (Communications, general business)
B — Recorder (Patents and related business)
C — Public Lands (Tract books, disposals, etc.)
D — Private Land Claims (Matters relating to private claims)
E — Surveying (Surveyors General, public land surveys)
F — Railroads (Railroad grants, wagon roads, etc.)
G — Pre-emption (Preemptions, townsites, Indian lands)
K — Swamp Lands (Administration of swamp land grants)
L — Drafting (Plats, maps, etc.)
M — Accounts (Registers and Receivers, payments)
N — Minerals (Administration of mineral lands and laws)

The duties of the division "E" were given in detail as follows:

> Division E.
> In charge of the principal clerk of surveys. This division is charged with the supervision of all work relating to the public surveys. Instructions to the surveyors-general relative to the extension of surveys or the examination and correction of erroneous surveys are here prepared. All contracts for surveys by deputy surveyors are here examined and passed upon, and the adjustment of accounts for surveying service made and submitted to the Treasury Department for payment. All returns of surveys are referred to this division for examination as to correctness, and after approval are filed in the division. All records and correspondence relating to Indian, military, light-house, live oak, or other reservations are in charge of this division.
> To this division are also referred matters pertaining to the establishemnt of boundary lines, by astronomical surveys, between States and Territories of the United States.
> The plats and field-notes of all surveys are retained on the files of this division, in charge of a principal draughtsman, who supervises all work of draughting or copying plats of surveys, and who compiles and prepares the official map of the United States. There are in this division more than 50,000 plats or maps of township and other surveys.

If a division corresponded, the letter would be identified by the alphabetical designation of the division, such as, "Letter E, dated June 4, 1881." In later years, there were minor reorganizations of the divisions. Eventually, Divisions "P" and "O" were added. The surveying division was always "E."

Burdett also requested funds for the purchase of iron posts or quarried stone monuments to mark the public surveys. The loss of corners in the Plains States and California was very great. He thought the monuments should be set at alternate section corners or at least, at every township corner to preserve the surveys.

In a letter to Richard S. Hall, Oconto, Wisconsin, dated February 9, 1876, Hall was advised to restore lost closing corners along the north boundary of a township at proportionate distance from the corners controlling the township line. Prior to this time, surveyors had been advised to place the closing corners at record distance (usually a short distance) from the controlling or regular corners.

On June 24, 1876, James A. Williamson was appointed Commissioner of the GLO.

The *Civil Appropriations Act of July 31, 1876,* 19 Stat. 102, provided that the initial points of the rectangular surveys could be established by triangulation; however, none were so determined in the continguous 48 States. The act also abolished the Office of Surveyor General in Kansas, which was closed June 30, 1876.

The *Act of July 31, 1876,* 19 Stat. 121, required that railroads had to pay for the costs of surveying the lands to be conveyed under their grants. An accurate account had to be kept of the costs of survey and patent could not issue until the cost was paid into the Treasury. The Commissioner had been charging the railroads, the railroad companies appealed, and the law was passed, backing up the Commissioner.

Commissioner Williamson issued his first *Annual Instructions to the Surveyors General* on August 23, 1876, which were very lengthy; they made several changes in policy and procedures. In succeeding years, they were referred to in much the same manner as were circulars.

Among other things, the instructions listed the order of priority in the surveys in accordance with the *Appropriations Act:*

(1) Agricultural land
(2) Irrigable land
(3) Timber land
(4) Coal land
(5) Exterior boundaries of townships
(6) Private land claims

The deputies were not to begin any survey until after the contract had been approved by the Commissioner. Triangulations made to establish a remote township corner would not be paid for, effectively stopping the permission given in the *Appropriations Act.* The township lines were to be extended in the normal manner, from south to north. If at all possible, a whole township must be surveyed, not just a part of it. The

Circular of June 1, 1864, was modified. Both banks of navigable streams were to be meandered. All former or old corners started from or tied to were to be fully described in the field notes. The *Special Instructions* for any contract were to be sent to the Commissioner along with the contract for approval.

In a letter to a man in Minnesota, dated September 28, 1876, Williamson stated that the survey of dried-up lakes had been suspended in April 1876 and that island surveys in "closed" States (those with no Surveyor General) were also suspended, pending legislation on the matters by Congress. The Wolf Lake case was having its effect.

In the *1876 Annual Report,* Williamson complained that the entire Washington staff of the GLO had been reduced to only 145 people, who were all overworked and underpaid, and who had no space to work in. People and files were occupying hall space. During the year, 59,192 letters had been received and 54,127 letters written, which filled 42,315 pages of folio records.

Williamson also commented that he couldn't see any good reason why dried-up lake beds should be allowed to go to the adjacent owners and he urged legislation on the matter.

On February 17, 1877, in a letter to William Vincent, the County Surveyor in Manistee, Michigan, Williamson stated that riparian rights in a lake could only be determined by a proper court, which was a clear backing-off on the lakes issue.

The *Act of February 16, 1877,* 19 Stat. 231, appropriated $2,500 for and directed the Commissioner to have resurveyed Tps. 18 and 19 N., R. 1 W., Michigan, because they had never been "properly surveyed."

These resurveys were made by T. Gale Merrill, Deputy Surveyor, under contract dated March 3, 1877. Work began April 16, 1877, and was completed July 17, 1877. The resurveys were approved August 3, 1877. During the resurveys, many of the original corners were found and adopted by Merrill who then restored the lost corners by the current single proportion, north-south rules. The areas on the plats were changed to fit the returns of the resurvey, which caused some problem as the following letter indicates:

Department of the Interior
General Land Office
Washington, D.C.,
June 24, 1878

E. G. Goddard
East Saginaw, Michigan
Sir:

I have received your letter dated the 14th instant, requesting information as to the subdivision of Section 6, Tp. 18 N., Range 1 West, Michigan, especially as to the N. E. ¼ of N. W. ¼ and N. W. ¼ of the N. E. ¼ which you say was purchased from the State by you prior to the resurvey of said Township in 1877.

By the original plat the tracts referred to were represented as containing 80.72 acres, while by the resurvey they contain but 69.73 acres, and you ask in view of the fact that the lands were purchased by the original plat, how the section is to be subdivided.

In reply I have to say that evidence having been submitted to Congress that the survey of the section line in said township was never made, a law was passed authorizing a resurvey which was therfore made and approved, and the resurvey will govern both as to boundaries and areas of tracts.

Enclosed herewith is a diagram of said Sec. 6, showing the areas of tracts therein together with the length of the lines. The land having been purchased by you from the State, you will have to look to the State for indemnity for the deficiency.

Very Respectfully
J. A. Williamson
Commissioner

Resurveys caused many headaches and misunderstandings, so few, if any, had been done for over 20 years. Now the citizens were again pressing for resurveys, claiming that the original surveys were fraudulent or "grossly" in error, which was not always true, with the costs to be borne by the government, and with the idea that a government resurvey would be "official," ending arguments. In doing a dependent resurvey today, the BLM would never return a new area on patented lands, but this wasn't true 100 years ago. It isn't known when the practice of assigning new areas on the plats of resurveys for patented lands ceased.

The *Act of March 3, 1877,* 19 Stat. 377, is known as the "Desert Land Act." It allowed homesteading of up to 640 acres of irrigable desert land and dealt with water rights. To "prove up" on a desert homestead, the settler had to bring water to the land and irrigate and farm a portion of it; this proved difficult to do. Many of the so-called "wastelands" would now demand surveys.

On March 9, 1877, Williamson informed a man in Michigan that islands formed in a navigable lake following statehood belonged to the State under Federal Court rulings on that subject.

On December 17, 1877, Williamson replied to E. R. Robinson, County Surveyor in Boyne Falls, Michigan, in response to an inquiry about how to resurvey the meander line along a lake. The pertinent portion of that letter follows:

". . . you state that having commenced at the meander corner on the East line of Sec. 32, T. 33 N., R. 6 W., you ran as the field notes require, N. 77° W., for a distance less than one call, and found the departure of the meander line from the lake beach so great as to cause dissatisfaction to the interested parties, and ask how the difficulty is to be remedied.

The examination in the field made in this case or the data furnished by you is insufficient to lead to a solution of the question.

Upon examination of the field notes, it is found by computation that the meander line will close on the meander corner on the North line of Sec. 32 within reasonable limits.

Having by reference (if possible) to a known line of the meander survey adjusted your compass and chain to correspond with the same, you will retrace the meander line in the same direction in which it was originally run from the corner on the direction in which it was originally run from the corner on the East line of Sec. 32, through its various bearings and distances to a known point on the line, and if necessary to the meander corner

on the North line of Sec. 32. (which if lost can be restored from the adjacent section corners).

Having ascertained the difference in the falling of the terminal point of your survey as compared with the actual identified point on the meander line you will then proceed to establish the corner or corners, which may be required, by well known rules of proportion.

In accordance with your request. . ."

Williamson described the principles still followed in retracing and adjusting a meander line. It is unknown what the "well known rules of proportion" were that Robinson was supposed to use. The *Circular of March 13, 1883,* on *Restoration of Lost and Obliterated Corners* (13, p. 11 and 12) describes proportioning the length of the courses in proportion to the length of the closing error and to proportion the angles to a closure. Hodgman's Manual describes a "Compass Rule" adjustment for balancing a survey in computing areas (p. 138) but describes (by BLM parlance) the "Grant Boundary Method" in adjusting the misclosure in the resurvey of an irregular-shaped tract (p. 96-99). The text *Elements of Surveying* by Charles Davies, published in 1870, describes the compass rule for adjusting the closing error in area computation (p. 94-95) but then makes an arbitrary adjustment in actual fact. The compass rule method is said to have been devised by Bowditch about 1805, but the letters, circulars and instructions up to the 1880's make no mention of it. The 1930 and subsequent *Manuals of Surveying Instructions* use the compass rule for adjusting a nonriparian meander line, which is also used to adjust misclosures in making area computations.

In the *1877 Annual Report,* both the Secretary of the Interior and Commissioner of the GLO recommended the closing of all the Offices of Surveyors General, appointing one Surveyor General to be located in Washington, D.C., abolishing the contract system, and having the surveys executed by paid employees appointed by the Surveyor General. The Commissioner again recommended legislation granting dried-up lakes and small islands to the States.

During the 1870's, several inventors devised iron post survey monuments to mark the survey corners and tried to sell them to the GLO. All received polite replies to the effect that it was a good idea, but funding, freight costs, and burden to the deputies were too great.

On January 4, 1878, in a letter to James M. Gillan, County Surveyor, in Appleton, Wisconsin, Gillan was advised to restore the lost quarter corner between sections 9 and 16 at midpoint between the section corners and on line with a line tree that was originally two and one-half chains east of the now lost quarter corner.

On March 27, 1878, F. Markey, County Surveyor, Chillicothe, Missouri, was advised that under the particular circumstances, he should restore the lost corner of sections 1, 2, 11 and 12, T. 56 N., R. 25 W., Fifth Principal Meridian, at a double proportionate position between the found corners to the north, south, east, and west of the lost corner. So, the single proportion north-south policy was not a hard and fast rule.

The *Act of June 3, 1878,* 20 Stat. 88, allowed timber cutting on mineral lands in nine of the Western States and territories. The timber was to be used only on those lands.

The *Act of June 3, 1878,* 20 Stat. 89, provided for sale of 160-acre tracts of timber lands in Oregon, California, Nevada, and Washington Territory at $2.50 per acre. The act was a mistake and later led to large timber land frauds.

On March 2, 1831, Congress had passed legislation making it a felony to steal timber from public lands, but left it to the local land offices to enforce the law. Timber trespass, or "depredation," as it was called, was becoming a common practice and something had to be done. The Commissioner of the GLO began appointing special agents to catch and prosecute timber trespassers and Congress provided funds for protecting the timber. But Deputy Surveyors were required in many cases to make resurveys to prove that the timber was taken from the public lands. The whole thing eventually led to setting aside of the Forest Reserves, requiring more surveys.

On July 30, 1878, Williamson wrote to a photolithographic company in Washington, D.C., requesting a cost estimate on tracing and restoring the plats on file in the GLO and making litho copies of them. Every time a copy of a plat had to be sent to anyone, a draftsman would place a thin tracing paper over it and trace off all of the lines, dimensions, areas, etc. After repeated tracings, the "original" plat had been literally cut to pieces and many of the figures undiscernible. Apparently the company gave a favorable estimate because for several years thereafter, copying, restorations, and photolithographic copies of the plats were paid for. In the first instance, the GLO plat was a copy of the originals which were retained by the Surveyors General. Quite often the copy was not an exact duplicate of the original; discrepancies did occur. The badly deteriorated copy was copied or restored and beyond doubt, did not always result in an exact or correct duplicate. So it is not unusual to find discrepancies between the original plats and the "Washington copy."

On August 13, 1878, Charles Scott, Deputy Surveyor under contract with the Surveyor General of Dakota, established the Black Hills Baseline in South Dakota. The initial point for this system was the 69th mile post on the Dakota-Wyoming boundary, surveyed by Rollin J. Reeves in 1877. The South Dakota boundary is the Black Hills Meridian. All ranges in the system are numbered east from the boundary and north or south of the baseline. The Black Hills Meridian and Baseline control the surveys in most of western South Dakota, and the Fifth and Sixth Principal Meridians control the remainder.

The following letter was sent in reply to an inquiry of the correct method of subdivision of an elongated section:

Department of the Interior
General Land Office
Washington, D.C.,
January 13, 1879

J. M. McEwen, Esq.
Wausau, Wisconsin

Sir:

In reply to your letter of the 6th instant, requesting information in regard to the proper method of subdividing Section 19, Township 28 North, Range 9 East, 4th P.M. Wisconsin, I have to state as follows:

Upon examination of the field notes, I find that in surveying this section (which contains more than twice the usual quantity of land) the Surveyor established

supplementary corners at every twenty chains between the quarter posts on the north and south boundaries of the section and the range line. The proper method of proceeding will therefor be: —

1st. Run *Straight lines* between the estabished quarter section corners — U.S. Surveys — establishing a corner at the intersection of the said lines, which corner will be common to the four quarter sections.

2nd. Run *Straight lines* from the supplementary corners on the south boundary to the corresponding corners on the north boundary and establish corners at the intersections with the line previously run between the *East* and *West* quarter posts, also at the points equidistant between the supplementary corners and the corners thus established on the east-and-west quarter line.

3rd. Establish quarter-quarter corners for the *east half of the section,* at points equidistant between the section and quarter-section corners and between the quarter corners and the corner common to the four quarter sections and subdivide the Northeast and Southeast quarters by straight lines running between the corners thus established.

4th. On the west boundary of the section the corners common to lots 6 and 7 and 18 and 19 should be established at points equidistant between section and quarter section corners.

As the supplementary corners established on the north and south boundaries of the section at 7.85 and 5.43 chains respectively, east of the range line were disregarded in constructing the plat by which the lands were sold no notice will be taken of them in subdividing.

Very Respectfully,
J. A. Williamson
Commissioner

Fig. 49 is a reasonable facsimile of the original plat of section 19 (approved February 15, 1854) showing the pertinent facts. While the method of subdividing the northwest quarter and southwest quarter of the section is not the procedure that would be used today, it undoubtedly seemed reasonable in 1879. An almost identical reply went to a man in Missouri on May 15, 1879, in regard to subdividing a section similarly elongated except it was against the north boundary of the township. Both letters were contrary to the method used today and contrary to the opinion as expressed in the letter to Barney on March 8, 1875.

In a letter to Orlando H. Brewster, Surveyor General of Louisiana dated January 17, 1879, Williamson rejected payment to a Deputy Surveyor for the retracement of 281 chains of the south boundary of a township. The Deputy had retraced three and one-half miles to find a "starting corner" but had not reestablished the "lost" corners. Williamson said he would have approved payment had the Deputy set those corners.

By the *Act of March 3, 1879,* 20 Stat. 352, Congress amended the deposit survey laws. The entire act follows:

CHAP. 170.—An act to amend section twenty four hundred and three of the Revised Statutes of the United States, in relation to deposits for surveys.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section twenty-four hundred and three of the Revised Statutes of the United States be, and is hereby, amended so as to read as follows:

SEC. 2403. Where settlers make deposits in accordance with the provisions of section twenty-four hundred and one, the amount so deposited shall go in part payment for their land situated in the townships, the surveying of which is paid for out of such deposits; or the certificates issued for such deposits may be assigned by indorsement, and be received in payment for any public lands of the United States entered by settlers under the pre-emption and homestead laws of the United States, and not otherwise.

Approved, March 3, 1879.

Some "deposit survey" frauds had been perpetrated under the old deposit system and the Commissioner had issued stringent rules regarding them, requiring that the Surveyors General have positive proof of actual settlement before accepting deposits and issuing contracts for deposit surveys. Williamson and succeeding Commissioners issued strict orders in that regard to no avail. The deposit survey frauds, usually referred to as the "Benson Syndicate Frauds," began almost immediately on a grand scale.

John A. Benson entered the public land surveys picture as a Deputy Surveyor by a contract dated September 9, 1873, for the survey of the subdivisional lines of T. 26 N., Rs. 1 and 2 E., Mount Diablo Meridian, California. He held other contracts in succeeding years, and it is believed he did reasonably good work until 1879.

After passage of the deposit survey amendment, Benson organized his "syndicate", abetted by clerks in the Surveyor General's office, with the financial backing of a San Francisco bank. Certainly the Surveyor General would have had to be turning his head also. Although much has been written about the Benson Syndicate Frauds the swindle worked basically in the following manner:

Benson hired deputy surveyors, clerks, and draftsmen to work the system. Using bank funds to get operating, he filed applications for deposit surveys in innumerable townships in remote parts of the State.

The "settlers" were nearly all fictitious; although actual persons often appeared, signed the sworn affidavits, and made the deposits, they had no idea where the land was located on which they were filing. Some street bum may have been used and paid for his participation with a bottle of whiskey or wine and sometimes even a few dollars cash. Of course, the deposit certificate would be immediately assigned to Benson; it was almost like a certified check and could be used to pay for public lands anywhere, not just the lands applied for as before the amendment.

Benson gathered his gang of deputies, many of them actual Deputies who had held legitimate contracts before this time, but many were not surveyors at all and some were wholly fictitious. Contracts would then be let to them for the survey of a township or block of townships for which the phony applications and deposits had been made. But, more likely than not, no survey would be actually made in the field. If any surveying was done it would only be a skeleton job—a few township boundaries or parts of them or a few "section lines"

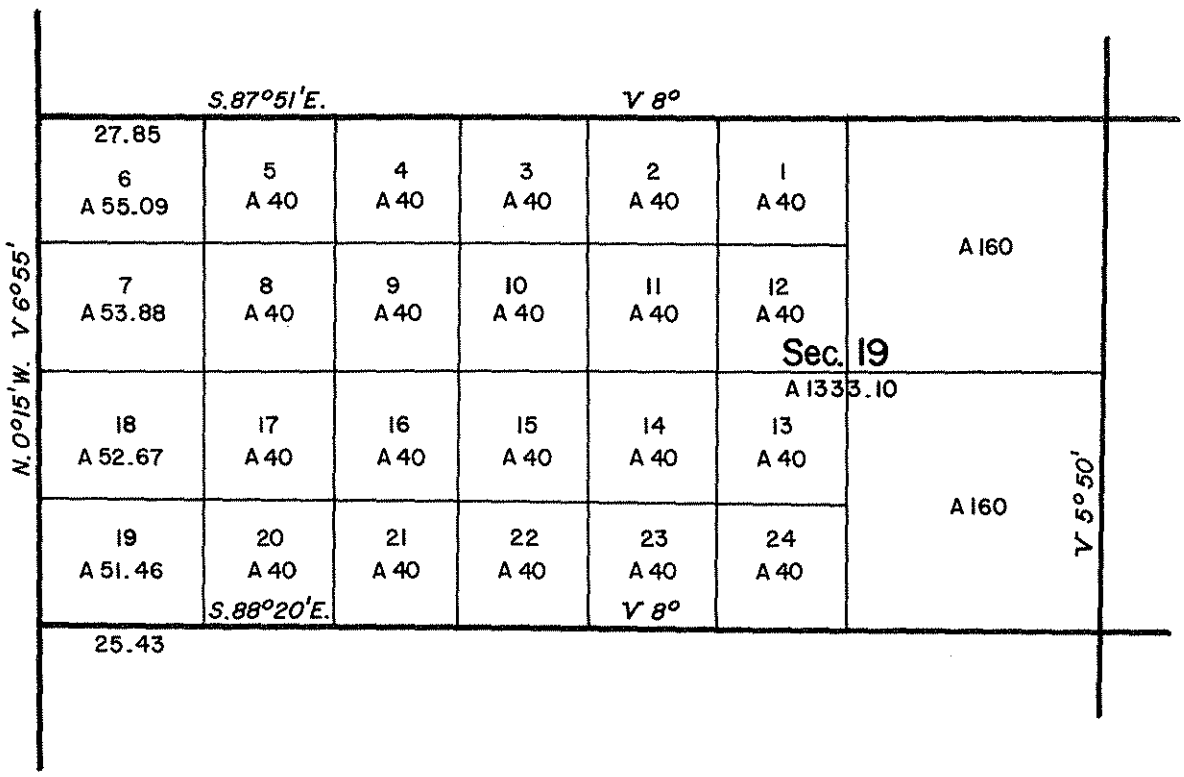


Figure 49. Elongated Section.

surveyed by traversing along accessible trails, ridge tops, along river canyons, and "stubbing in" corners in calculated positions. These "stub jobs" were usually done in areas where actual settlers and miners were located, which gave them the appearance that a survey was being made, however crude and poorly done. But on the whole, no Deputy went to the field at all.

While the Deputy was supposed to be or actually was in the field, the field notes of these surveys were being written up, and plats prepared in a "boiler room" in San Francisco by the support personnel or deputies of the syndicate. If any field work was done, it would be incorporated into the record. The remainder of the topographic calls would be sketched in from any source available, USGS maps and the like. Much of the California coast had been or was being mapped by the U.S. Coast Survey (USCS), and there is no doubt that their triangulation stations and other data were used to full advantage.

The rates per mile for these surveys were always the highest rate allowed by law. Often supplemental contracts were let for the survey of intervening townships and township lines to enable the Deputy to extend the survey lines to a deposit survey township. Although allowed by Congress, the Commissioner did not allow triangulation as a method for extending the lines. The government ended up paying from the regular appropriations for many thousands of miles of fictitious or fraudulent work.

The deposit certificates were sold to timber companies, land speculators, and possibly even to legitimate settlers, perhaps at a small discount, who in turn used them at full face value to pay for public lands which they wanted to acquire. Most of the Redwoods area of northwestern California were purchased with deposit certificates or cash under the *Timber Lands Act of June 3, 1878.*

The Benson Syndicate Frauds extended to several other Western States. No direct evidence exists that Benson operated the swindle in other States, but the *Annual Report of 1887* reported that the syndicate also extended into Nevada, Oregon, Colorado, Arizona, New Mexico, Idaho, Montana, Utah, and Washington. It is probable that after California, Colorado suffered the worst.

The fraudulent surveys scheme operated until about 1885 during the tenure of Commissioner William A. J. Sparks. During this five-year period, most the surveys contracted for were under the deposit system. The annual appropriations for all the surveying districts for surveys was only $300,000 per year. Congress was very tight with the funding and as a result, got what they paid for, but the scheme could not have worked without collusion on the part of trusted government employees, underpaid or otherwise, all the way up to the GLO in Washington.

The *Act of March 3, 1879,* 20 Stat. 394, created a Public Lands Commission to study the public land laws and make recommendations to Congress on legislation to improve the system or to formulate policies. Thomas Donaldson, a former Register of the Boise, Idaho, Land Office, was appointed to the Commission. He prepared the first report in 1880; it was revised twice, the last time in 1883. The third revision, current to December 1, 1883, is titled *The Public Domain, Its History, with Statistics,* by Thomas Donaldson. The copy which this writer used for reference material was originally printed in 1884. While "Donaldson" contains many inaccuracies, it is a good reference for most of the history of the public land laws and operations up to the end of 1883.

The *Civil Appropriations Act of March 3, 1879,* 20 Stat. 377, created the U.S. Geological Survey (USGS), a new bureau within the Department of the Interior. Among other duties, the USGS was made responsible for the classification of the public lands and examination of the geologic structure, mineral lands, and other resources; eventually it would execute some of the rectangular surveys of the public lands.

On April 2, 1879, Williamson replied to M. Spear, Deputy County Surveyor in Roscoe, Kansas, in regard to his request for a resurvey of Tps. 6-8 S., Rs. 23-25 W., Sixth Principal Meridian, or 9 townships. Spear was told to investigate thoroughly to see if any corners existed and how the topography fit. If the surveys were indeed fraudulent, the owners could have deposited under the deposit law the estimated cost of resurveying the townships, and Williamson would have appointed a Deputy to execute the work. If not fraudulent, the County Surveyor should do the work, based on the original corners, receiving payment from the settlers. An identical letter was sent on April 7 in regard to a similar request for T. 17 S., R. 9 W. The Surveyor General's office in Kansas had only been closed three years, and none of the surveys could have been more than 25 years old, but resurveys were already being requested.

On April 17, 1879, Commissioner Williamson issued a Circular that said the plats of the rectangular surveys did not become official until accepted by the Commissioner of the GLO. Prior to this time, the plats became official when approved by the Surveyor General. Under this order, the triplicate plat was not officially filed in the local land offices until after official acceptance of the survey in Washington. This acceptance date was usually noted on the margin of the plat but was not evidenced by certification on the face of the plat until July 1, 1925. Both approval and acceptance dates were shown on the plats from 1925 until June 30, 1948; since 1948, only the acceptance date has been shown.

A letter to Raphael Pumpelty, Oswego, New York, dated May 19, 1879, was a portent of things to come. Pumpelty had requested survey of some land (where isn't known, but not in New York) containing standing timber which laid between the original meander line and a lake. The letter said in part:

> "... and stating that the tract of land referred to in your former letter is not of recent formation but was omitted by an error in the original survey — which fact is shown by the existence of trees outside the meander line. I have to state that in my opinion the tract is Government land."

Williamson declined to take any steps pending legislation by Congress. This statement on omitted lands outside a meander line was a reversal of Wilson's stand on the same issue at Black Lake in 1870, but no action was taken.

In a letter to E. K. Robinson, Boyne Falls, Michigan, dated September 27, 1879, Acting Commissioner J. M. Armstrong, advised him to proportion the record distances to the original bearing trees, to reestablish the corner point at a quarter corner, because the record didn't agree with the actual position of the trees. This advise was a reversal of the former policy of restoring the corner point at intersection of the record bearings.

On November 1, 1879, Acting Commissioner Armstrong issued a Circular letter on the *Subdivision of Sections and Re-establishment of Lost Corners* (previously referred to). The Circular (see Appendix) was printed for the purpose of replying to requests for opinions on the subjects, which had previously been written out each time. The restoration of lost interior section corners was by the single proportion, north and south method.

In the *1879 Annual Report,* Williamson again requested adopting the use of iron posts to be set at alternate section corners in areas where "durable stones" and bearing trees were not available. (He gave one story to the "inventors" but a different version to Congress.)

On January 20, 1880, Armstrong issued a general Circular for public consumption to the effect that no more island or lake surveys would be made, pending legislation from Congress, which never happened.

On January 23, 1880, Armstrong advised G. C. Kothe, Salina, Kansas, to establish a quarter corner, which fell in a river, at record bearing and distance, East, 1.46 chains from the original witness corner located on the left bank of the river (not at midpoint between section corners, the former policy).

On January 30, 1880, Armstrong advised Thomas A. Bagley, County Surveyor, Medicine Lodge, Kansas, to restore a lost township corner at proportionate distance between found corners to the north and south of the lost corner.

On *February 11, 1880,* 21 Stat. 301, Congress approved a resolution to have printed annually the *American Ephemeris and Nautical Almanac.* This large volume eventually led in 1910 to the condensed version, modified and published for use by the surveyors of the public lands, about as we know it today. The *American Ephemeris* is still published.

On February 19, 1880, Armstrong replied to John M. Morrow, Ellsworth, Kansas, on the subject of off-line closing corners, found to be south of the Third Standard Parallel South. The letter concluded with these words: "Purchasers of lands in sections *adjoining the Standard on the south,* will hold to the Standard notwithstanding the fact that a portion of the closing corners were originally established south of said line."

On March 9, 1880, Thomas H. Holley, County Surveyor, Fulton, Missouri, was advised that he should probably restore a lost township corner by double proportion between found corners to the north, south, east, and west, because it was ten and one-half miles between found corners along the range line.

The *Act of June 16, 1880,* 21 Stat. 287, granted two million acres of land to be selected by the State to Nevada in lieu of the "school land" sections 16 and 36 granted at Statehood. Nevada selected large blocks of these lieu lands in the better agricultural valleys of the State. There are no "school sections" in the townships in Nevada.

The *Annual Instructions,* issued June 26, 1880, required that all Surveyors General establish a meridian station at or near their offices and that all solar compasses and needle compasses used by Deputies had to be checked and adjusted on that station. This practice continued until recent years.

On July 22, 1880, Williamson advised B. F. Lee, Authority, Kansas, that closing corners found as much as three rods off-line, north of the southern boundary of Kansas, would control the section lines in Kansas but the owners would hold to the State boundary. This policy on off-line closing corners has never changed.

On September 3, 1880, Williamson instructed J. B. Bausman, "Examiner of Surveys and Special Agent" (he was a clerk in the GLO), to investigate a case of omitted lands between the record meander line and the actual shore of Lake Benton in section 8, T. 109 N., R. 45 W., Fifth Principal Meridian, Minnesota. The tract had been surveyed by J. Gilbert Bryon, County Surveyor of Lincoln County, and a plat and field notes sent to the Commissioner for approval. Williamson told Bausman to make a thorough investigation of the facts. Bausman reported that the tract was in fact omitted lands and that the County Surveyor had made a proper survey of it. On March 7, 1881, Williamson forwarded the County Surveyor's plat and field notes to Jacob H. Stewart, Surveyor General at St. Paul, instructing him to construct a proper plat of the tract, to approve the plat and Bryon's field notes, and to send the duplicate plat to Washington. Stewart complied and the plat was accepted April 12, 1881, thus the surveys were done and a County Surveyor's work was used to do it.

On September 25, 1880, Stewart was instructed to investigate omitted lands along the Minnesota River in T. 121 N., R. 46 W., Fifth Principal Meridian, and if they were high and dry and "large" in area, he was authorized to have them surveyed.

On or about October 19, 1880, Daniel G. Major, surveyor and astronomer, under contract with Commissioner Williamson, established the initial point of the Ute Meridian and Baseline in the vicinity of Grand Junction, Colorado. This small system was established to survey the Ute Indian Reservation lands. The work was paid for from Indian Service appropriations for the survey of Indian allotments, but actually only a few townships were surveyed on this system. It was dropped in 1881 or 1882, and the Sixth Principal Meridian and New Mexico Principal Meridian surveys were extended over the Ute Reservation instead.

In October, 1880, and on November 27 and December 11, 1880, James L. White, Surveyor, Ocala, Marion County, Florida, wrote to Commissioner Williamson asking advice on the proper procedure to be used to subdivide section 9, T. 15 S., R. 23 E., Tallahassee Meridian. The section had been surveyed originally by Lewis M. Prevost, Jr., Deputy Surveyor, in 1843. The Silver Spring (River) crossed the northern half of section 9 and Prevost had used a traverse and triangulation to cross Silver Spring when surveying the east and west boundaries of the section. White found that the part of section 9 lying north of Silver Spring was actually offset about 4.25 chs. east in relationship to the corners south of Silver Spring, and asked how he should subdivide the section. In his reply of December 3, 1880, Williamson cited the *Act of February 11, 1805,* and advised the straight line intersection method of establishing the center one-quarter corner. Upon receipt of this letter, White then sent to Williamson a sketch of the section showing the distortion. On January 12, 1881, Williamson reversed his opinion, and advised White to establish the center one-quarter corner at midpoint on the east-west center line and then connect the two halves of the north-south center line to it. That procedure would result in a deflection in the north-south center line at the center one-

quarter corner, i.e., a broken north-south center line. Williamson stated that the intent of the Act of February 11, 1805 was to divide a section into four equal parts, as nearly as may be, but that the law did not contemplate such an irregularity as existed in section 9; thus, to comply with the intent of the law, White should subdivide the section with the method described.

The author has seen numerous instances of gross distortion, especially in sections against the north and west boundaries of the townships, where the one-quarter section corners had been "stubbed out" during the original survey and no actual connection made through, from the last one-quarter corners to the section corners on the exterior boundaries. In such cases, the principle outlined by Williamson could have been, or perhaps, should have been applied. When Mansfield proposed the law of 1805, he did not contemplate gross distortions and fictitious closing; therefore, he did not provide for them in the Act. Williamson pointed out what the intent of the law was at the time it was written and passed by Congress.

The omitted-lands problem came up again in early 1881 but in a different form.

In 1834 and 1835, Ambrose Rice, Deputy Surveyor, surveyed fractional T. 9 S., R. 9 E., Michigan Meridian, in Ohio, made fractional by Maumee Bay of Lake Erie and a large marsh. The marsh was meandered and the sections adjoining it were lotted. On the northeast side of the marsh was located a sandy beach area, similar to an outer reef. Rice extended a township line across the marsh to the reef and surveyed three small islands which were part of it between the marsh and open lake. On the original plat, the marsh was labelled "Impassable Marsh covered with Water." The field notes described it as a "flag marsh." The fractional sections abutting the marsh on the south were patented in 1844. In 1852, the State of Ohio filed claim to the marsh under the *Swamp Lands Act.* The claim was denied on the grounds that the marsh was not swamp land under the terms of the act. In early 1881, applications were made for the survey and purchase of the marsh.

On April 2, 1881, Williamson issued *Special Instructions* to John B. Marston, County Surveyor, Toledo, Ohio, for the extension of the rectangular surveys over the marsh, which Marston executed during April and May. This is the first survey in which a steel tape was used to measure the lines. (Steel tapes were being used by mineral surveyors but not by Deputy Surveyors.) The plats were approved in June 1881. Lands within the surveyed marsh (and possibly the sand islands too) were patented in 1882. The successor in title to the fractional lots (south of the marsh, patented in 1844) was Gertrude J. Niles. The successor in title to the lands surveyed by Marston within the marsh was the Cedar Point Club. Niles claimed ownership of the marsh on the grounds of riparian rights and sought to eject the Cedar Point Club. The matter went to court. The Sixth Circuit Court of Appeals upheld Cedar Point Club's title on February 8, 1898 (see *Niles vs. Cedar Point Club,* 85 Fed. Rep. 45). Niles appealed to the U.S. Supreme Court, which upheld the Circuit Court decision on December 4, 1899 (see 175 U.S. 299).

On May 3, 1881, a new *Manual of Surveying Instructions* was issued. Though referred to as the *1881 Manual,* it was not really a manual and was never enacted into law as was the 1855 Manual. The tome is titled *Instructions of the Commissioner of the General Land Office.* In 1880, a meeting was held in San Francisco with attendance by the Surveyors General; today such a meeting is called a cadastral workshop. At this meeting, a commission was appointed to revise the 1855 Manual; they met in Cheyenne, Wyoming, and prepared these instructions. Perhaps Commissioner Williamson wasn't too impressed or felt he didn't have legal authority to issue a new Manual in view of the wording of the *Act of May 30, 1862.* This conclusion is based partly on the wording in the penultimate paragraph of the introductory chapter of this Manual. These intructions made no really basic changes in the 1855 Manual; they deal primarily with housekeeping details, note keeping, contracts forms, citation of the laws, and closing limits. Closing limits are defined and tightened somewhat. Also included is the Circular letter printed on November 1, 1879, which includes the proportion north-south method for restoring a lost section corner. These instructions did not change the 1855 Manual and were not in violation of any statute law, but they were nothing more. They were not widely accepted by the Surveyors General; the consensus was that they were garbage. The 1881 Manual was never enacted into law by Congress (see Appendix).

In July 1881, island surveys were resumed on a limited basis via the deposit system. They have continued to be made ever since.

On June 17, 1881, Noah C. McFarland was appointed Commissioner of the GLO and took charge July 6. He was a very capable man and the opinions emanating from the GLO soon began to reflect that fact.

On August 26, 1881, McFarland issued *Special Instructions* to Richard O. Chaney and William W. Smith, U.S. Surveyors, for the survey of the "Public Land Strip," now the Oklahoma Panhandle. The strip was bounded on the north by the Kansas-Colorado boundary (37° north latitude), bounded south by the Texas boundary (36°30′ north latitude), on the west by the New Mexico boundary (103° west longitude), and on the east by the Indian Territory boundary (100° west longitude). Chaney and Smith were to establish an astronomic station southeast of Las Animas, Colorado, and extend a telegraph line to it for time signals and determine within three seconds the 103° west longitude. From that station, they were to extend a line due south to 37° north latitude, set a monument, continue the line due south to 36°30′ north latitude, and there establish the initial point of the Cimarron Principal Meridian and Baseline. The initial point, at the northwest corner of Texas, was to be monumented with a stone 6 feet long and 12 inches square. The baseline was to be surveyed due east, using a tangent line and offsets therefrom, to 100° west longitude, with quarter corners and section corners thereon. At the end of each two miles, a "Bausman's Patent U.S. Land Monument," an iron post, was to be set, with the other corners to be monumented with stones. The Principal Meridian was to be surveyed back, due north along 103° west longitude, to the south boundary of Colorado, similarly monumented. Double chaining and frequent astronomic observations were required. A Standard Parallel was to be surveyed due east from the meridian, 24 miles north of the baseline. Bausman monuments were to be set at alternate section corners on all township, range, and section lines. This was an elaborate survey and the only initial point ever

established at a precisely predetermined point by latitude and longitude; it was also the last one ever established in the contiguous 48 States.

Chaney and Smith complied with instructions. The field notes indicate they ran the meridian line south between October 19 and November 16, 1881. On the latter date, they established the initial point and surveyed the baseline between November 21 and Christmas Day. The remainder of the surveys followed. All of the townships are numbered north and east from the initial point. The Principal Meridian is part of the east boundary of New Mexico. Due to the later boundary disputes with Texas and a resurvey, the baseline does not exactly follow the Texas boundary.

In a letter to P. T. Curran, Wausau, Wisconsin, dated December 24, 1881, McFarland flatly stated that line trees control the direction of a line but not the proportions along it. He also stated that a lost quarter corner should be restored at midpoint between section corners.

In a reply to James E. Rankin, Elk Rapids, Michigan, dated December 29, 1881, McFarland stated that meander lines along the navigable Great Lakes did not mark the boundary—the water did. He also stated that small, inconsiderable areas between the meander line and water's edge went to the riparian owner; everyone knew that meander lines were run in a manner that would leave such small strips.

In the *1881 Annual Report,* McFarland asked for repeal of the deposit survey systems, explaining how the deposit frauds worked. He asked for $10,000 to purchase iron post survey monuments. Both McFarland and the Secretary of the Interior asked for examiners of surveys to be direct employees of the Commissioner instead of most examinations being made under the Surveyors General. The words used are the following:

> "It is an absurdity to suppose that truthful and honest returns of examinations in every paticular will be made by deputy surveyors, upon whom surveyors general are more than oridinarily dependent for examiners, when it is considered that the examining deputy will at some time, if not already under obligations, have this own work examined by the very deputy whose work he has, if honest, condemned. The temptation of overlooking defects, either in the survey of lines or the marking of the same, has proven too great to be resisted by them. It is safe to say that not one per cent of the number of examinations are satisfactory to this office in the results obtained."

The Secretary also requested that patents be issued to individual Indians for lands within a reservation which they had improved and occupied.

In a letter to H. L. Humphrey of the House of Representatives, dated January 19, 1882, McFarland approved the idea of including the words "and resurveys" in the appropriations bill. The wording was used in the *Appropriations Act of July 7, 1884,* 23 Stat. 194, and generally thereafter.

In a reply to J. H. Davenport, County Surveyor, Cherokee, Iowa, dated March 4, 1882, McFarland stated that as a general rule, a lost section corner should be restored between the lost corners to the north and south of it, but in this (unspecified) situation the lost corner should be restored by double proportion. This was the first real break in the north-south proportion policy of the *1881 Manual.*

On May 23, 1882, in reply to J. D. Lonsdale, Dale City, Iowa, McFarland discussed magnetic variation and then the proper method of restoring the lost corner of sections 27, 28, 33, and 34, T. 79 N., R. 30 W., Fifth Principal Meridian, concluding with these words:

> "The lost corner in question, should in the opinion of this office, be established, first, on the north and south line, between nearest corners, proportionate measurement; and if the difference in such location should exceed one chain (the legal allowance) then to correct the position of the point thus found by measurement of the east and west lines intersecting at the point sought to be established."

So the "closing limits" of a section were being used to determine whether a corner should be single or double proportioned. This closing limit concept was carried into the location of quarter section corners as well when their location was in doubt.

The surveys in Kansas, Nebraska, Dakotas, and eastern Colorado had progressed very rapidly. Many were, no doubt, executed by the "buggy wheel" method of chaining. In those open prairies, there is more than ample evidence that the original surveys where possible were surveyed by loading down a buckboard wagon with stones or stakes. A cloth was tied to a spoke of a wheel. One man drove the team, another kept line with a compass, and a third counted the revolutions of the flagged wheel. When the requisite number of revolutions was counted, to measure a half mile, the counter threw out a stone or stake. The more honest surveyors actually halted the wagon and set the monument "as per instructions." Obviously, the line so run would not be straight. The distances to topographic calls were also determined in the same way. If the east-west section lines were run, they were either stubbed out or run in the above described manner. Apparently, the stones used were a soft sandstone or conglomerate from which the marks soon weathered away, making them difficult if not impossible to identify if other stones were in the area. Or the stones just melted from the action of rain, ice, and snow into an unidentifiable pile of sandy rubble.

Most of the settlers and the local surveyors honored these corners where they found them in accordance with the law; some did not. Many letters came into the GLO from settlers complaining that a neighbor and often some surveyor had moved a corner or corners to straighten up the section lines. The moved corner was usually a quarter corner on an east-west line. The Commissioner would invariably reply that the original position was correct according to law, that to correct the situation it should be returned to the original position, and that since he had no authority over private lands, the complainant should submit the matter to the local courts for resolution.

But the "floating" corner was a different problem. Inquiries were made in this tone: "I ran the section line between the section corners and found this crumbled rock lying on the ground, two chains east and one chain north of midpoint — What should I do?" The stock reply was that if the rock was identified as the original, and it had not been moved by

"designing persons," then it had to stand in place. But if it was more than one chain out of position (i.e., more than one chain out of midpoint or more than one chain off-line), and could not be positively identified as being in the original position, then the quarter corner should be treated as lost and be restored at midpoint and on line. This, of course, was the answer on regular lines, not those against the north and west boundaries of the township, in which case appropriate modifications were made. The whole rationale of the one-chain criteria was the Manual closing limits of a section.

The repeated requests for funds to purchase iron post monuments were made to correct the described problem. But so far, the only place they had been used was the Public Land Strip (Cimarron Meridian surveys).

In a letter dated June 2, 1882, C. B. Magruder, County Surveyor, Rockledge, Florida, was advised to establish a one-sixteenth corner on a section line at proportionate position between a quarter corner and meander corner. This method (principle) was probably followed until about the 1930's when a hiatus in the policy took place.

On September 6, 1882, *Special Instructions,* were issued to Jacob R. Meyers, County Surveyor, West Branch, Michigan, for the extension of the public land surveys over approximately 100 acres of omitted lands between the original and actual meander line of "Peach Lake" in section 15, T. 22 N., R. 2 E., Michigan. The land was from 5 to 200 feet in elevation above the lake level. The survey was made and approved. Patent was issued to Lots 7, 8, 9, and 10 (the omitted land) to W. R. Meyers. The owner of Lot 2 (adjoining the original meander line) sued for possession of the land patented to Meyers. The local court ruled in 1883 in favor of the owner of Lot 2 and ejected Meyers. The outcome of the case is unknown. The original plat and omitted lands survey are shown in Figs. 50 and 51.

The survey of nonexistent lakes began in 1882. Evidence was produced to the satisfaction of the Commissioner that a tract of land in sections 22 and 23, T. 40 N., R. 4 W., Wisconsin, which had been meandered and shown on the original plat as being a lake, was in fact high, dry land and no lake had ever existed where shown. The Commissioner had plats constructed, protracting the section line across the lake and the section subdivision lines, completing the survey. The original plat of this survey was sent to Wisconsin authorities on November 11, 1882. Pertinent portions of the original survey and completion (protractions) are shown in sketches (see Figs. 52 and 53).

On December 9, 1882, P. T. Curran, Deputy County Surveyor, Wausau, Wisconsin, was advised to restore the lost corner of sections 3, 4, 9, and 10, T. 30 N., R. 6 E., by double proportionate methods. No mention is made of single proportion north and south, nor the one-chain test.

On January 16, 1883, the Secretary of the Interior ruled that island surveys could no longer be made under the deposit survey system. Those surveys, when made, had to be paid for from the regular appropriations for public land surveys, a special examination had to be made to determine that the island had been in existence since before statehood or the original survey, and adjacent land owners had to be notified 30 days prior to the survey that a survey was going to be made of it. Those are still the basic rules today.

The *Appropriations Act of March 3, 1883,* 22 Stat. 603, provided $15,000 for the resurvey of poorly or fraudulently surveyed townships in Kansas.

On March 19, 1883, McFarland issued a Circular to all Surveyors General that in the future, all Supplemental Diagrams (plats) had to be made on the regular township-sized paper. Up until this Circular, supplemental plats had been made any size, from a few inches square up to the uniform township plat size.

On March 13, 1883 the first full Circular was issued by the GLO, titled *Restoration of Lost and Obliterated Corners.* These instructions are published in 1 LD 339 or 671. By this Circular, the single proportion north-south method of restoring a lost interior section was forever put to rest. Double proportioning, based on the law, was adopted and still remains. The subdivision of sections was not included; that part remained in the 1879 Circular. The *Restoration of Lost and Obliterated Corners Circular* was reissued in identical form in 1885 and on September 25, 1891. It was sent to all the Surveyors General on May 7, 1883, with instructions that it superseded the *1881 Manual,* especially p. 40 (see Appendix).

In June 1883, the Department of the Interior began publishing the more important Land Decisions, relating to the public lands administration and surveys. These volumes are numbered consecutively and are referred to as the "LD's." Reference is by volume and page, such as 1 LD 339, 2 LD 115, etc. For several years previous to this, the more important LD's were printed in the Annual Reports.

In the *Annual Instructions to the Surveyors General* (sent out in June 1883), McFarland directed that in the future all calls of topography entered in the field notes would be given along the true line, not the random line as was the practice in many districts. Tangent lines could not be run for more than 12 miles and offsets to the true line had to be carefully made. McFarland prohibited the use of open sight or needle compasses in the survey of Standard Parallels and other "principal" lines (presumably township lines). Bearing trees marked south of the Standard Parallel at Standard Corners must be marked to refer to the sections north of the standard, not south of it as was the former practice. He again reminded them that the *Special Instructions* for every survey had to accompany the contract when sent to him for approval. These *Annual Instructions* were almost a manual in themselves.

On July 31, 1883, McFarland issued *Special Instructions* to Henry C. F. Hackbush, Deputy Surveyor, Leavenworth, Kansas, for the resurvey of Tps. 6 through T. 10 S., Rs. 23 and 24 W., Sixth Principal Meridian. Part of those instructions reads as follows:

> "According to the best evidence obtainable it appears that the returns of the original subdivisional survey of said townships were fraudulent, and that, in fact, no subdivisional lines were run and marked in the field by the U.S., hence the survey to be made by you although termed a *resurvey* will, in fact, be a survey *de novo,* and you will disregard any corners which you may find in the interior of said townships."

The instructions directed Hackbush to dependently restore all lost corners on the exterior boundaries of these ten townships in accordance with the Manual and Circular of March 13, 1883, then survey the interior section lines as though it was an original survey. Those ten townships con-

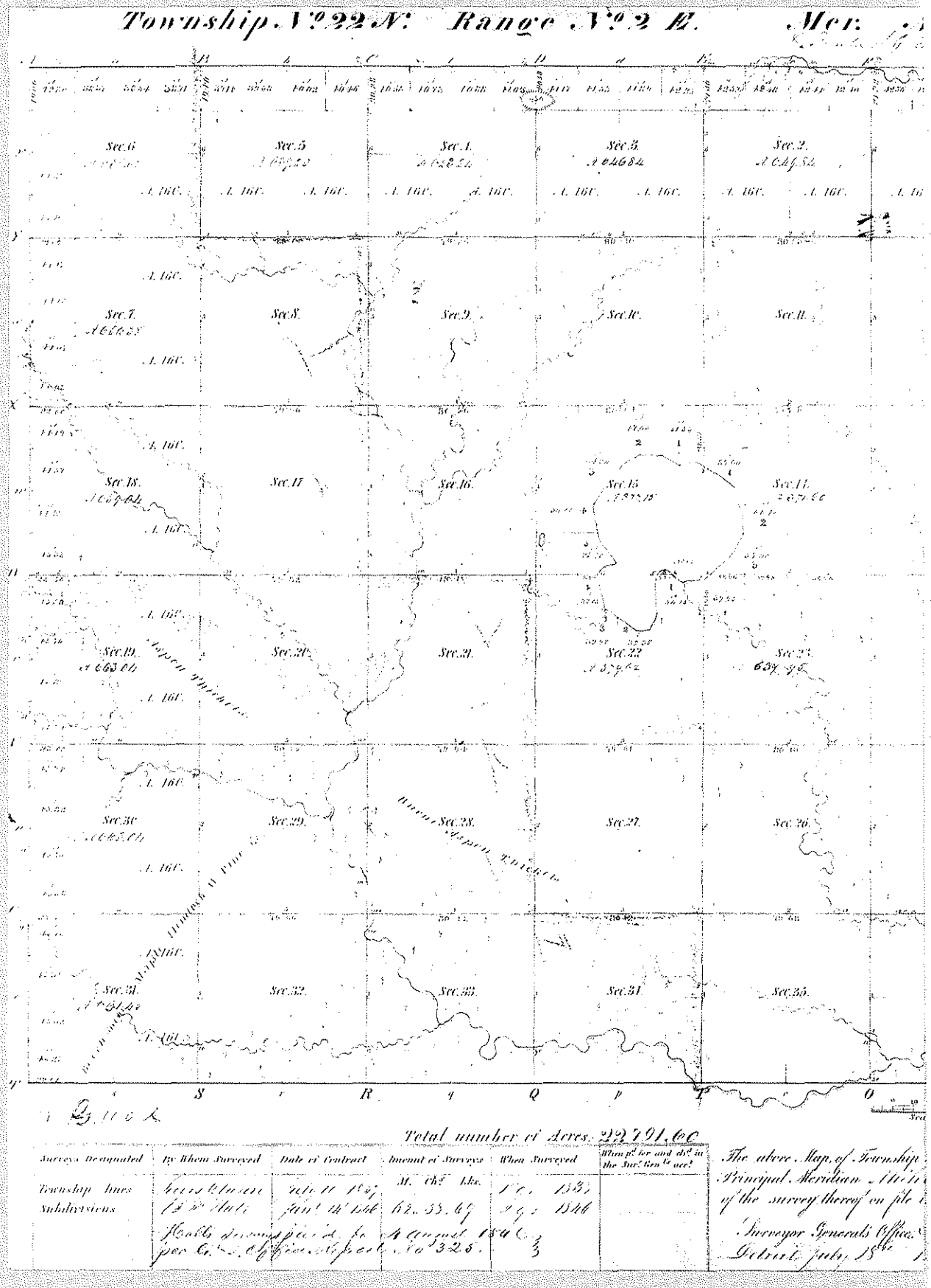
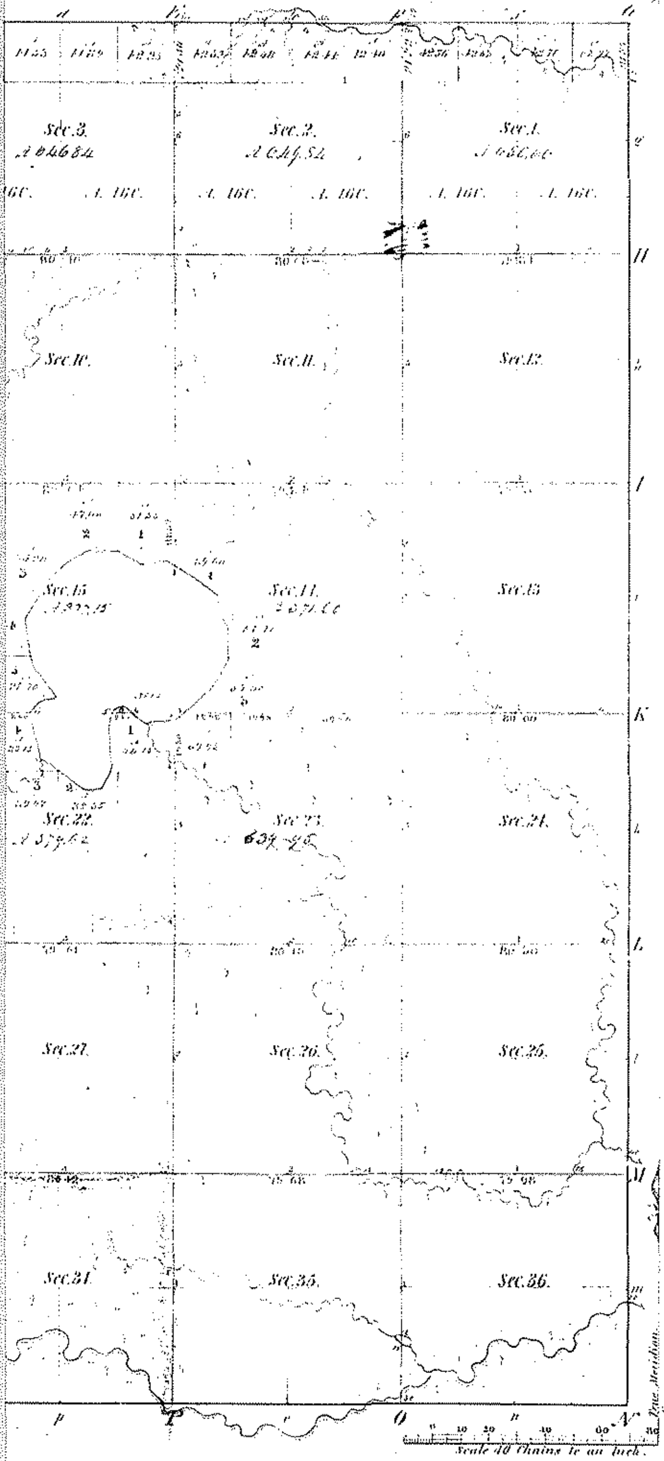


Figure 50. T.22N., R.2E., Michigan. Plat Approved July 28, 1846.

N° 2 E. Mer: Mich.



Meanders.

Posts	Courses	Ch.s lk.s	Posts	Courses	Ch.s lk.s	Posts	Courses	Ch.s lk.s
[illegible]	[illegible]	[illegible]						

...s. 22791.60

	When p.d for and ch.d in the Sur.r Gen.ls acc.t
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The above Map of Township N° 22 North of Range N° 2 East of the Principal Meridian Michigan is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved.

Surveyor General's Office
Detroit July 18th 1846 } Lucius Lyon, Sur.r Gen.l

PLAT
OF
SEC. 15, T. 22 N. R. 2 E. MICH. MER.
Michigan.

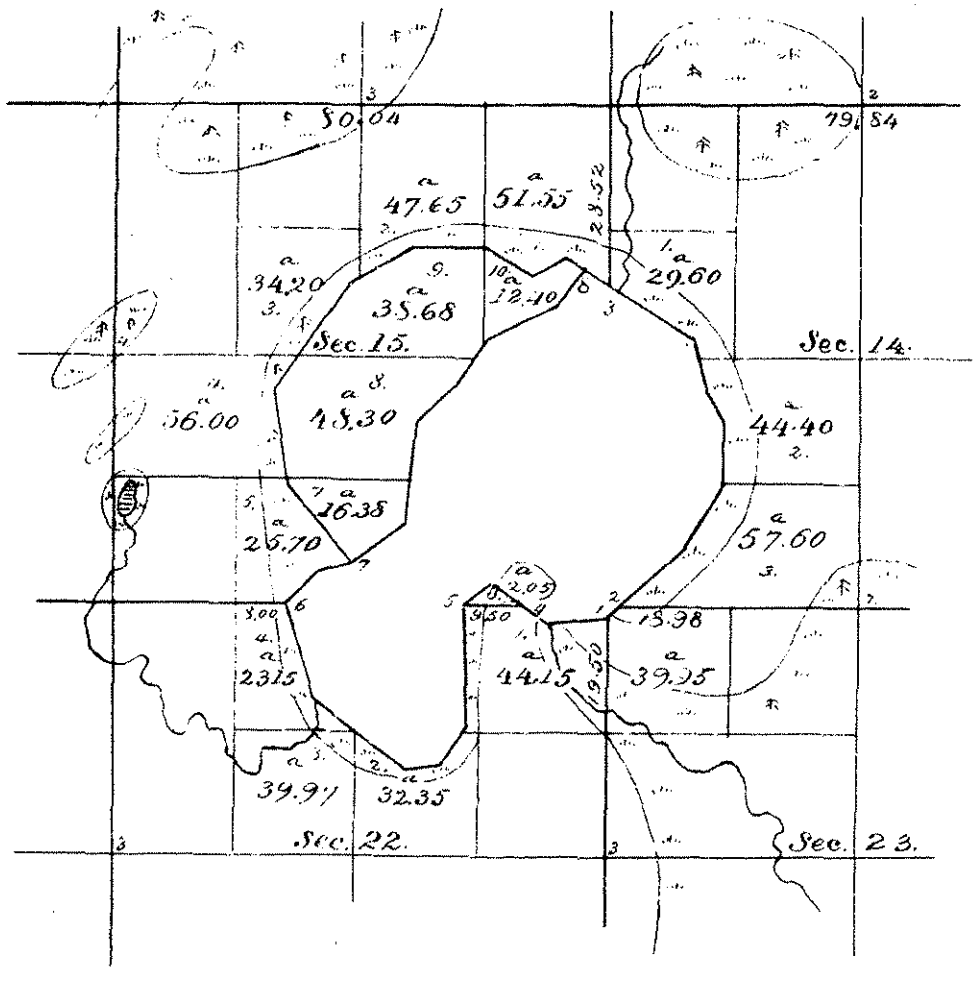


Figure 51. T.22N., R.2E., Michigan. Survey of Omitted Lands — 1883.

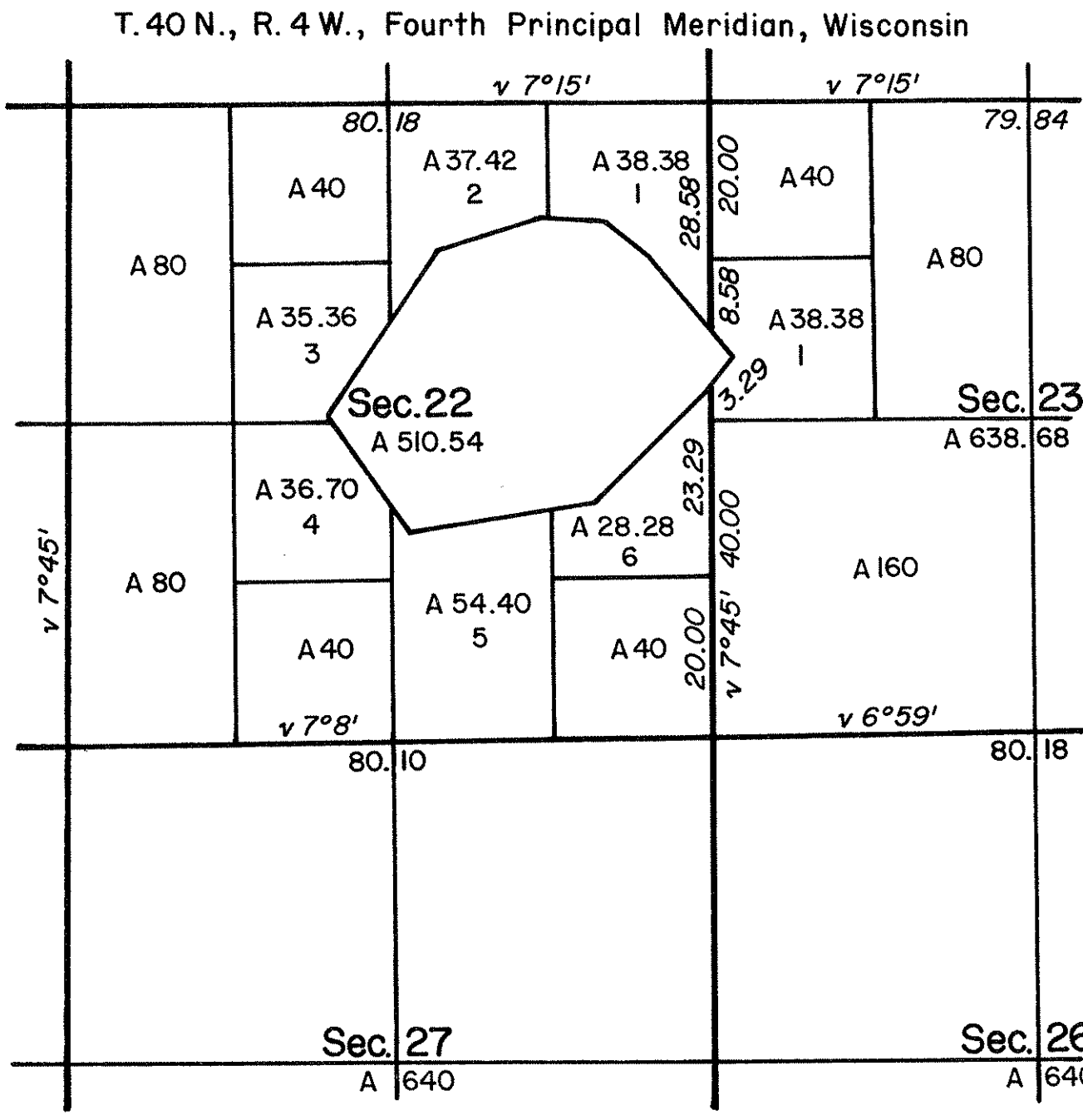


Figure 52. Portion of Original Plat. Approved Feb. 14, 1859.

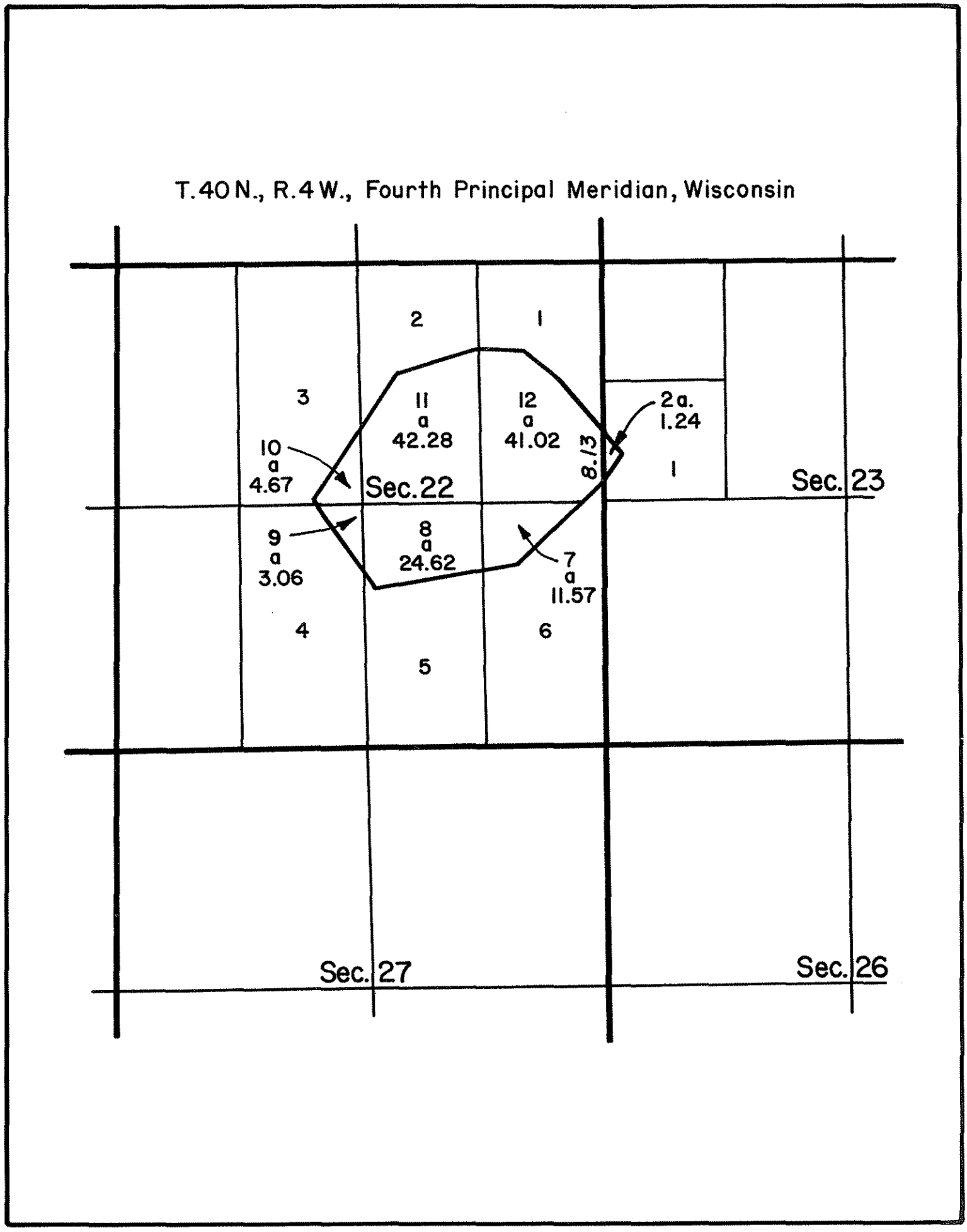


Figure 53. Completion (Protracted) of Non-existent Lake. Approved Nov. 11, 1882.

tained settlers on patented lands, so anyone can visualize the complaints that could have arisen, but no evidence was found that they did.

On September 6, 1883, McFarland rejected applications for survey and entry on large areas of omitted lands bordering meandered lakes in Florida. He said they were large in area, high and dry, but "under present circumstances" he would not permit the survey of them.

At 2 a.m., Wednesday, September 12, 1883, the Surveyor General's office in Olympia, Washington, burst into flame and burned; none of the plats, field notes and records were saved. The fire department deduced that the cause was a smoldering cigar butt thrown into a waste basket or trash can, which finally burst into flame and destroyed the building. The warning to Tilton about fire protection when he took office in 1854 had not included cigar butts! All the field notes and plats were replaced over the next few years from the Washington, D.C., copies. The only records irretrievably lost were internal records and the field notes of surveys just brought in from the field and in the process of being copied and platted, which had to be done over. As a result, the Washington field notes are all in legal sized books.

On December 13, 1883, in reply to Surveyor General Malachi Martin of Florida, McFarland refused to consider a survey of a reported hiatus between Tps. 19 S., Rs. 21 and 22 E. Martin reported two separate township lines were monumented on the ground. McFarland said the plats and field notes called for only one line and therefore there could be no hiatus. The naivete with regard to hiatuses would last another 15 years.

In the *1883 Annual Report,* McFarland asked for a general authority to execute resurveys and recommended establishing a civil government in Alaska. He also asked that fire extinguishers be supplied to all Surveyors General and that their offices be equipped with fireproof vaults.

The *Act of March 13, 1884,* 23 Stat. 4, established the standard time of the 75th Meridian as the standard time to be used in Washington, D.C. The railroads had already gone to a standard time system and this action recognized the standard time by the government; in a few years it prevailed throughout the country. This system was a real help to the surveyors in timing their observations and regulating their clocks.

On April 30, 1884, *Special Instructions* were issued to Henry Hackbush for the resurvey of seven townships and parts of two other townships in Kansas. Unlike the previous contract, Hackbush was to dependently resurvey these townships, accept all found corners, and restore lost corners in accordance with the *Circular of March 13, 1883.* Nearly identical instructions went to William Tweeddale, Topeka, Kansas on May 9, 1884, who was to restore all township boundaries and dependently resurvey the subdivisional lines in 16 townships. If he found no corners at all within a township, he was to subdivide that township as though it were an original survey. Tweeddale interpreted that provision very liberally and actually did original surveys within townships that really did have original corners in them. The residents complained, an examiner was sent out who found Tweeddale's work improper in many places, and the corrections of the work dragged on for several years.

The *Act of May 17, 1884,* 23 Stat. 24, established a civil government in the District of Alaska and a Land Office at Sitka. No provision was made for surveys, but U.S. Marshal Munson C. Hillyer was made ex officio Surveyor General with his office at Sitka. The mining laws were also extended to Alaska in pursurance with this act.

The following Circular letter was sent to all Surveyors General on May 31, 1884:

CIRCULAR

Department of the Interior
General Land Office
Washington D.C., May 31, 1884

Sir:

This office has received information that it is the practice of Deputy Surveyors to furnish, for a compensation, copies of their plats and notes to settlers and others, who apply for them in advance of their approval by the Surveyor General and acceptance by this office.

The practice is *objectionable* and you are hereby directed to notify all Deputy Surveyors in your district that in the future they must not furnish plats or field notes to any parties whatever, prior to the final acceptance of their surveys by this office.

Approved
H.M. Teller
31 May 1884 Secretary

Very Respectfully
N. C. McFarland
Commissioner

As far as is known, that Circular has never been rescinded. No cadastral engineer could for any reason give to anyone any information regarding a survey being made, which irritated many local and County Surveyors who wanted information, and the request was refused. Over the years, there was a relaxation of this regulation and the office would furnish a limited amount of information, always stamped "Unofficial Records." Since passage of the *Freedom of Information Act* in 1973, more relaxation of this Circular has been made.

The *Act of July 5, 1884,* 23 Stat. 103, placed all of the abandoned military reservations under the Secretary of the Interior and provided for the survey and disposal of those lands. Surveying abandoned military reservations would become a heavy workload for the surveyors in ensuing years. The *Act of February 24, 1871,* 16 Stat. 430, had provided for the survey of certain military reservations in the West; with the 1884 act, all surveys were to be handled by the GLO.

The *Civil Appropriations Act of July 7, 1884,* 23 Stat. 194, provided $5,000 for the purchase of iron posts to be used to monument survey corners on nontimbered lands; $50,000 was provided for examinations of surveys and $300,000 for surveys, not to exceed $9, $7 and $5 in ordinary country, and $13, $11 and $7, in heavily timbered and brushy country; $75,000 was appropriated for timber protection and $10,000 for resurveys.

In the *Annual Instructions* dated July 25, 1884, McFarland made some significant changes:

(1) The $50,000 for examinations would be expended by the Commissioner only.
(2) All resurveys would be made under contract with the Commissioner.
(3) The iron posts would be distributed as the Commissioner saw fit, but would be used at all mineral monuments established in the future.
(4) Both banks of all non-navigable streams, three chains, or

greater in right angle width would be meandered. Those already meandered on only one bank would have the areas of lots abutting them calculated on the basis of a uniform width.

(5) Slope chaining would be adopted in steep terrain, with the slope angle determined by the vertical arc of the surveying instrument, and reduced to horizontal with the tables provided (sets of tables were sent).

(6) The angle and elevation of all slopes over 3° would be given in the field notes.

(7) All improvements and lines of occupation of non-reservation Indians would be noted and entered in the field notes.

(8) No deputy could be given a contract for both the subdivisions and the exterior boundaries of a given township. If he did the exteriors, he could not have a contract for the interiors and vice-versa.

On March 26, 1885, William A. J. Sparks, an attorney, was appointed Commissioner of the GLO; he resigned November 17, 1887.

In his *Annual Instructions* of September 15, 1885, Sparks directed that in the future, all survey contracts would be examined; any found faulty would be rejected until corrected in every respect. The $15,000 appropriation for resurveys would be used only with his express permission. Retracements of old lines to effect a closure would not be paid for because that work was a necessary part of any contract. The result was that many retracements were just a paper job and were never done. When a survey was to be made, an invitation for bids had to be advertised and the contract let to the lowest competent bidder.

In the *1885 Annual Report,* Commissioner Sparks reported that an average of six examiners had been on duty in the field in the previous three years. Many faulty and incomplete surveys were found. To prevent further fraudulent work in the field and acceptance of fictitious surveys by the government, Sparks directed the suspension of all examinations of the plats and field notes in his office on surveys already contracted for and supposedly executed until after the surveys were examined in the field. Some of the surveys were later cancelled and some that had been suspended, were never officially cancelled or reinstated. In any case, the examination program did not completely eliminate fictitious or fraudulent surveys, though they were reduced. The Surveyor General of Washington reported on bad surveys found in his district and suggested that all surveyors should be government employees paid at a regular salary. This Annual Report contains a lengthy report on the fraudulent surveys, how the frauds worked, and reports on land frauds.

The *Appropriations Act of 1886* provided only $50,000 for surveys in all the districts, except Nevada, which received $30,000. Appropriations in 1887 were also $50,000. The country was in a depression and the fraudulent survey scandals induced Congress to cut appropriations to the bone. Most States did no original work at all except on Indian reservations. Some resurveys of the fraudulent work were done, but they weren't really resurveys. When a township was found to be fraudulent, the work was done over as an original survey. The rationale was that a survey not done in fact, was not a survey at all. The result was many hiatuses and overlaps.

The *1886 Annual Report* contains long lists of fraudulent, cancelled, and suspended townships. With no work being done, the Surveyor General of Louisiana sent a lengthy report on the bad surveys and ensuing problems in that State. The Surveyor General of Colorado suggested that the USGS (i.e., government employees) should be used to execute the rectangular surveys at the same time they did the topographic mapping, a convincing argument.

The *Act of February 8, 1887,* 24 Stat. 388, is known as the "General Allotment Act of 1887" or "Dawes Act." It provided for patenting of allotments to Indians either living on or off a reservation. In all probability, most of the Indian allotment patents were made under the provisions of this act.

The survey of most of the Indian reservation boundaries had been made by surveyors under contract with the Surveyors General, beginning with Ludlow's survey of the Greenville Treaty boundary in 1797.

The *Act of April 8, 1864,* had placed the survey of Indian lands under the GLO. Each Indian treaty, Presidential Proclamation, Executive Order, or resolution pertaining to the lands of specific Indian tribes, might have contained some provision for the survey and the division of those lands, and now patent to individual Indians. For example, an Executive Order issued by President Grover Cleveland on May 1, 1886 reads as follows:

> "It is hereby ordered that all that portion of country in Washington Territory, withdrawn from sale and settlement, and set apart for the permanent use and occupancy of Chief Moses and his people, and such other friendly Indians as might elect to settle thereon, with his consent and that of the Secretary of the Interior, by Executive Orders dated April 19, 1879 and March 8, 1880, respectively, and not restored to the public domain by Executive Order, dated February 23, 1883, be, and the same is, hereby, restored to the public domain, subject to the limitations, as to disposition, imposed by the act of Congress, approved July 4, 1884, (23 Stat. pages 79 and 80) ratifying and confirming the agreement entered into July 7, 1883, between the Secretary of the Interior, and the Commissioner of Indian Affairs, and Chief Moses and other Indians of the Columbia and Colville Reservations, in Washington Territory.
>
> And it is hereby further ordered that the tracts of land in Washington Territory, surveyed for and alloted to Sar-sarp-kin, and other Indians, in accordance with the provisions of said act of July 4, 1884, which allotments were approved by the Acting Secretary of the Interior, April 12, 1886, be and the same are hereby set apart for the exclusive use and occupation of said Indians; the field notes of said allotments being as follows:"

The field notes of 20 or more allotments were then given. This Executive Order is the sole known source of the field notes of these allotments; most of which were for rectangular tracts, about 160 acres in area, lying in all directions and in no way conforming to the rectangular surveys. It isn't known who surveyed the allotments nor when, but they were shown on the rectangular survey plats and the sections around them were lotted in fractional lottings when the rectangular surveys were extended through the area.

There are innumerable instances of individual Indian allotments surveyed in this manner. Most were surveyed by the GLO, but many were surveyed by land surveyors under the direction of the Commissioner of Indian Affairs.

Most of the Indian reservations in the West were surveyed into townships and sections, following the 1864 act. Many of those were subdivided into 20-acre or 40-acre allotments by subdividing the sections containing agricultural lands or at least lands that were thought fit to be farmed. Those subdivision of section surveys did not follow the present legal method of subdividing a section. Most sections were subdivided by establishing the north and south one-sixteenth section corners on the east and west boundaries of the section at midpoint between the quarter corners and section corners. The sixteenth section corners were called "⅛ corners." The sixty-fourth and one-sixteenth corners on the north and south boundaries of the section (called "⅛ and 1/32" corners) were established in a similar manner, i.e., at equidistant positions. The section would then be subdivided by running a true line from the north sixteenth corner on one section line to the north sixteenth corner on the opposite section line, establishing the "⅛ and 1/32" corners at equidistant positions. The same process was used on the east and west centerline between quarter corners and on the south sixteenth section line. The 20-acre allotments were numbered 1 to 32, with number 1 in the northeast corner and 32 in the southeast corner of the section. This procedure has previously been referred to as the Three Mile Method (see Fig. 47).

Sometimes the centerlines of the sections would be surveyed properly and then the quarter sections subdivided in the manner described. Unless the section was a perfect square, with all quarter section corners exactly at midpoint and on a line between section corners, this procedure would not result in a legal subdivision of the section.

Remember that these surveys usually resulted in a technically correct procedure. Boundary lines based on these subdivisions and monuments are just as binding on all parties as are other monuments of an officially approved survey; however, exceptions might be made. For example, assume a section was subdivided into allotments, but for some reason the whole northeast quarter was patented as the "NE ¼ of section 10" (ignoring the allotments 1-4 and 13-16) and the remainder of the section was patented by allotment numbers. Later, the "NE ¼ NE ¼ of section 10", is reacquired by the government. Would the three allotment corners within the northeast quarter control the reconveyance? They would not because they were not used in the original patent nor in describing the reconveyance. But the allotment corners on the exteriors of the whole northeast quarter would control the boundaries of that quarter section and its legal subdivisions. Of course, much would depend upon the method, order, description, and chain of title within and around the section. No general rule could be advanced; each section must be dealt with on an individual basis. In fact many allotments were surveyed by the Indian Service (later the BIA) and the BLM has no record of them. Much of the *Dawes Act* is now codified in *25 U.S.C. 331,* et seq.

On June 2, 1887, Sparks issued a new Circular on the proper method of subdivision of sections, which was a slight expansion of the *Circular of November 1, 1879,* and eliminated the improper restoration of lost corners given in the latter Circular.

On August 9, 1887, Deputy Mineral Surveyor George W. Garside, a Deputy Surveyor in Nevada who went to Juneau because of the depression and lack of work, surveyed the Aurora Lode, Mineral Survey No. 41, near Juneau, Alaska. This survey was approved by Barton Atkins, ex officio Surveyor General of Alaska, on September 9, 1887, and was the first official survey approved in Alaska.

On October 12, 1887, *Special Instructions* were issued to Henry Hackbush for the survey and subdivisions of the Ottowa and Modoc Indian Reservations in the Indian Territory. The Ottawa Reservation was surveyed into allotments by the Three Mile Method. The Modoc Reservation was subdivided into 24-acre allotments, each 20 chains east and west by 12 chains north and south.

No appropriation was made in 1886 for the Surveyor General of Nebraska for the fiscal year 1886–1887. The office was closed the end of June 1886 and the records stored in Lincoln until legislation was passed by the State for their safekeeping.

On March 27, 1888, Strother M. Stockslager, an attorney, was appointed Commissioner of the GLO.

On February 6, 1889, in a letter to Calhoun Fluker, Surveyor General of Louisiana, Stockslager directed that the distances to bearing trees should be measured to the centers of the trees, the first mention of this requirement, which was soon incorporated into the *1890 Manual* (then in preparation). Prior to this time most of the surveyors used their own judgment or habits in measuring to bearing trees from a corner. Some just guessed the distance, another might measure to the face of the blaze or to a chaining notch cut in the tree between the upper and lower parts of the blaze or at the bottom of the lower blaze. Some measured horizontal distance, others the slope distance; there were no consistent rules. The *1890 Manual* would also require that Arabic numbers be used. Some surveyors did not have timber scribes which were constructed for making circular scribing and therefore used Roman numerals in scribing trees.

The *Act of February 22, 1889,* 25 Stat. 676, divided the Dakota Territory into North and South Dakota and enabled those two territories and the Montana and Washington Territories to become States. North and South Dakota were admitted to the Union on November 2, 1889, Montana on November 8, and Washington on November 11, 1889, all with their present boundaries. In just ten days, the country had gained four new States.

By the *Act of March 1, 1889,* 25 Stat. 735, the Muscogee and Creek Indians in the Indian Territory ceded over three million acres to the United States. By the *Appropriations Act of March 2, 1889,* 25 Stat. 1004, the Seminole Indians ceded over two million acres. By Presidential Proclamation on March 23, 1889, those lands were declared open to settlement effective 12 o'clock noon, April 22, 1889. Two land offices were opened in preparation, one at Guthrie, the other at King Fisher Stage Station. People lined up for miles. On the opening gun at noon on April 22 thousands rushed to stake and lay claim to a quarter section of land, town lots, etc. This was the first and largest of several Oklahoma Land Rushes, lands that had been all previously surveyed.

By the *Act of March 2, 1889,* 25 Stat. 854, Congress withdrew all of the public lands (except in Missouri and a few other exceptions) from further private entry.

By the end of 1889, the Commissioner of the GLO was practically running the "Surveying Service," telling the Surveyors General what to do and when. By early 1890, a diagram showing the surveys to be executed had to be included with every set of *Special Instructions* issued.

On September 16, 1889, Lewis A. Groff, a former judge, was appointed Commissioner of the GLO.

On January 1, 1890, the *Manual of Surveying Instructions, 1890,* was officially issued. The new Manual updated and revised the 1881 issue and required the use of a solar instrument on all major survey lines. The *Act of October 1, 1890,* 26 Stat. 650, made the new Manual part of every contract by law. This Manual is quite an improvement over the *1881 Manual* but contained some insignificant errata. The lists of errata were sent to the Surveyors General, along with a copy of a corrected Manual on October 2, 1890.

The *Act of April 10, 1890,* 26 Stat. 53, authorized the appointment of a Surveyor General in both North and South Dakota. Erastus S. Williams was appointed Surveyor General of North Dakota and opened his office in Bismark on July 16, 1890. The Dakota office in Huron, under Boetius H. Sullivan, became the office of Surveyor General of South Dakota.

The *Act of May 2, 1890,* 26 Stat. 81, created the territory of Oklahoma, which included the Public Land Strip (Cimarron Meridian surveys) but not the Indian Territory. An unusual feature of this act was that it reserved a roadway, four rods wide, along every section line in the territory. The public lands in the territory were also opened to entry. Another item of interest is that the Registers and Receivers in some of the Oklahoma land offices issued patents for diagonal quarter sections. Instead of the "east half" or "west half" of a quarter, they were issued for the "diagonal NE ½ of the NE ¼ of section ____, containing 80 acres." The southwest boundary of such patent would run from the north quarter corner to the east quarter corner of the section. It is unknown why the patents were issued in that manner.

The *Act of July 3, 1890,* 26 Stat. 215, admitted the State of Idaho to the Union.

On *July 10, 1890,* 26 Stat. 222, the State of Wyoming was admitted. Colorado and Wyoming are the only two States whose boundaries are entirely described by lines of longitude and parallels of latitude, the same number of degrees in each. Colorado contains 104,247 square miles, whereas Wyoming contains 97,914 square miles, which shows the effect of convergency of meridians. The two States are the only ones which are laid out similar to the original plan put forth by Thomas Jefferson.

The *Appropriations Act of July 11, 1890,* 26 Stat. 228, at 261-262, provided funds for Surveyors General in 16 States and territories, which were Arizona, California, Colorado, North Dakota, South Dakota, Minnesota, Florida, Idaho, Louisiana, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

The *Act of August 30, 1890,* 26 Stat. 391, made a reservation of right-of-way for ditches and canals on all lands west of the One Hundredth Meridian. All patents for public lands west of that meridian issued subsequent to this act contain a reservation for ditches and canals, to provide for irrigation.

The *Act of September 25, 1890,* 26 Stat. 467, directed the Secretary of the Interior to have surveyed the Seventh Standard Parallel North of the Fifth Principal Meridian, which was the State boundary between North and South Dakota. Thus, a line of the regular rectangular survey system again became a State boundary and was surveyed in 1891 and 1892 by Charles H. Bates. The line was monumented with quarried stones, 7 feet long, 10 inches square, set halfway into the ground.

The *Act of October 1, 1890,* 26 Stat. 650, set aside and established Forest Reserves in the State of California. These first reserves were placed under the authority of the Secretary of the Interior as were the reserves to follow, the beginning of what would become the National Forests.

The *Act of March 3, 1891,* 26 Stat. 854, provided for the survey of Small Holding Claims in New Mexico and Arizona, which did not follow the rectangular system and were surveyed as numbered metes and bounds tracts, somewhat similar to any other private claim.

The *Act of March 3, 1891,* 26 Stat. 1095, repealed the old timber culture laws and amended the *Desert Land Act of March 3, 1877.* It required irrigation before patent could be issued on desert homesteads and also repealed the preemption laws, stopped the sale of public lands at public sale (except military reservations and other lands of a special nature), provided for Trustee Townsites in Alaska, provided for Trade and Manufacturing sites in Alaska, withdrew the coal lands and other lands containing precious metals (except mining claims), and native lands in Alaska from entry. Sec. 18 to 21 of the act grants rights-of-way for ditches, canals, and reservoirs on the public lands. Plats of these rights-of-way had to be filed with the land office, showing the locations. These plats are frequently incorrect and do cause some problems when the sections are resurveyed. Sec. 24 of the act provides that the President may set aside Forest Reserves by Presidential Proclamation.

The first Forest Reserve set aside by President Benjamin Harrison was in Wyoming by proclamatin dated *March 30, 1891,* 26 Stat. 1565. It adjoins Yellowstone National Park. Harrison subsequently reserved over 13 million acres of forest lands by proclamation in 1891 and 1892, all in the States and territories west of the Mississippi River. All of the Forest Reserves were under the Secretary of the Interior and in turn the GLO.

Later administrations reserved many more millions of acres. President Grover Cleveland withdrew nearly 27 million acres, McKinley seven million, and President Theodore Roosevelt withdrew over 18 million acres for forests.

On March 31, 1891, Thomas H. Carter was appointed Commissioner of the GLO.

Between October 26 and November 7, 1891, Charles W. Garside, Deputy Surveyor, surveyed a Trade and Manufacturing Site claimed by the Alaska Oil and Guano Company on Kenasnow Island (now Killisnoo Island) south of Angoon, Alaska. This claim was designated "U.S. Survey No. 5," and was the first of the Alaska Special Surveys now commonly referred to as "U.S. Surveys." It was approved by Orville T. Porter, ex officio Surveyor General of Alaska in November 1892 and was accepted April 23, 1893.

Between April 11 and June 2, 1892, George W. Garside, Deputy Surveyor, surveyed the Juneau Townsite, designated

"U.S. Survey No. 7." That special survey was also approved by Porter in November 1892 but was accepted on February 14, 1893. Therefore, U.S. Survey No. 5 was the first U.S. survey executed on the ground, but the Juneau Townsite was the first of these special surveys to become officially accepted by the Commissioner of the GLO. These metes and bounds surveys of isolated tracts, designated as "U.S. Surveys," in a serial numbering system, are used only in Alaska.

On October 7, 1892, Acting Commissioner William M. Stone, in a letter to the Surveyor General of Minnesota, rejected applications for the survey of omitted lands bordering Cedar Island Lake or Ely Lake in T. 57 N., R. 17 W., Fourth Principal Meridian. The original survey had been made by Henry S. Howe in 1876 and the plat approved August 7, 1876. The meanders of the lake were grossly in error or fraudulent. The omitted lands contained about 1,000 acres, high above the actual shore of the lake (which was not relicted). Stone cited *Hardin vs. Jordan* and *John P. Hoel,* 13 L.D. 511, 588 (a relicted lake case) as basis for his rejection of the application, made by G. A. Burns and others.

Burns appealed Stone's decision to the Secretary of the Interior who reversed the Commissioner's decision on January 19, 1895; *G. A. Burns,* et al, 20 L.D. 28. On October 31, 1895, Commissioner Silas W. Lamoreaux ordered the Surveyor General to have the survey made. That order was appealed by the upland owners on the basis of riparian rights. Their appeal was denied *October 29, 1896,* 23 L.D. 430. A contract was given to Thomas H. Croswell for the survey. The upland owners got an injunction halting the survey. The matter went through the courts and the decision of the Secretary in favor of Burns was eventually upheld. The survey was finally made by Edward L. Faison, Examiner of Surveys, in 1903 and 1904. The plat was approved by Eli S. Warner, Surveyor General of Minnesota, on June 29, 1905, nearly 13 years after the case first began. The plats of this survey are shown in Figs. 54 and 55.

On November 18, 1892, William M. Stone became Commissioner. Five months later, on March 28, 1893, Silas M. Lamoreaux was appointed Commissioner of the GLO.

The *1892 Annual Report* lists thousands of Indian allotment patents. The USGS selection of sites for reservoirs and irrigation ditches was far advanced. A Surveyor General was urgently needed in Alaska. Steel tapes, 66 feet (one chain) in length, were being used on the public land surveys.

On April 27, 1893, a *Circular* was issued which flatly prohibited any deputy from being an examiner of surveys. If money was allocated to a Surveyor General for examinations, the work had to be executed by a special examiner, the Surveyor General, or a clerk from his office.

In the *1893 Annual Report,* the Surveyor General of California strongly warned against resurveys of townships in which the lands were already patented. The first Annual Report of the ex officio Surveyor General of Alaska, Orville T. Porter, was also printed; most of the work in Alaska was mining claim surveys.

The 1894 *Manual of Surveying Instructions* was officially issued on June 30, 1894. The most notable revision in the procedures made in this manual was the elimination of the magnetic needle in the execution of the rectangular land surveys. The 1894 Manual was made part of every contract by the *Act of August 15, 1894,* 28 Stat. 285.

The *Act of July 16, 1894,* 28 Stat. 107, enabled Utah to become a State; it was granted sections 2, 16, 32, 36 in every township for schools and was admitted to the Union on January 4, 1896.

The *Act of August 9, 1894,* 28 Stat. 275, provided for the resurvey of Grant and Hooker counties in the State of Nebraska; $16,000 was appropriated on August 18, 1894, to pay for the work. The enabling act states in part:

> "Provided, That nothing herein contained shall be so construed as to impair the present bona fide claim of any actual occupant of any said lands to the lands so occupied."

These were the first townships surveyed in the manner which is today called an "Independent Resurvey." The work involved 171 miles of standard parallels, 405 miles of township lines, 2,490 miles of section lines and the exterior boundaries of all lands patented. Each owner was requested to point out to the surveyor the corners of his lands, as he knew them to be. The only requirement was that the tract when resurveyed had to be rectangular and could not contain more area than the lands he had patented. If two or more claims conflicted, the owners were asked to resolve their differences. If they couldn't agree, the claims were surveyed and shown in conflict. Each owner's tract was given a number beginning with Tract 37, then Tract 38, and so on. The same number was used only once in a township, nearly identical to the method used in the Donation Land Claim surveys in Oregon during the 1850's. The corners of each tract were monumented, then the township, range and section lines were surveyed, just like an original survey. Closing corners were set at the intersection of any tract boundary and a section line with lottings of the fractional sections against the tracts. The Commissioner was extremely proud of this procedure for it stopped complaints.

The Independent Resurveys of Grant and Hooker counties were completed in 1899. The plat of one township is shown in Fig. 56.

In the *1894 Annual Report,* request was made by both the Secretary of the Interior and Commissioner Lamoreaux that a bill be passed approving the execution of surveys to be made by the USGS or Civil Service employees.

The request was granted by the *Indian Appropriations Act of March 2, 1895,* 28 Stat. 876, in which $200,000 was appropriated for surveys in the Indian Territory by the USGS. These surveys were made in the Seminole, Creek, Choctaw, and Chickasaw lands, along with a topographic survey, starting in April 1895. At first they tried doing topographic work and rectangular surveys simultaneously, but this didn't work out very well. The following year they had separate operations and things went smoothly. Iron post monuments were set at each township corner, with stone monuments at all other corners. These surveys were completed in June 1898 with great success. Plats and field notes were prepared and approved by the Director of the Geological Survey and accepted by the Commissioner about the same as a survey by a Surveyor General would be. There was never a Surveyor General for Oklahoma; all the surveys there were done under the Commissioner.

On January 30, 1895, *Special Instructions* were issued to Josiah Gideon for the survey of a hiatus between Tps. 13 S.,

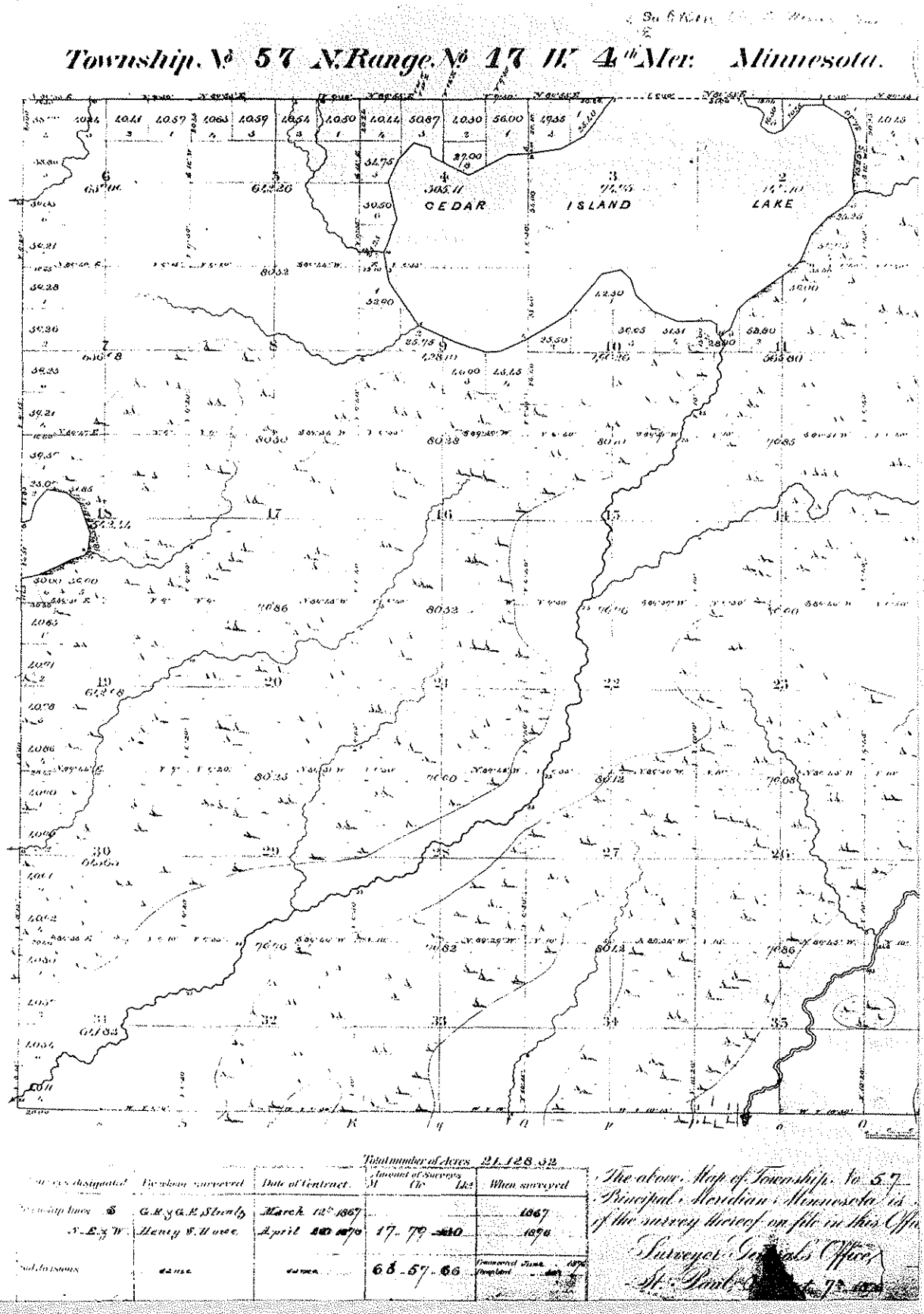
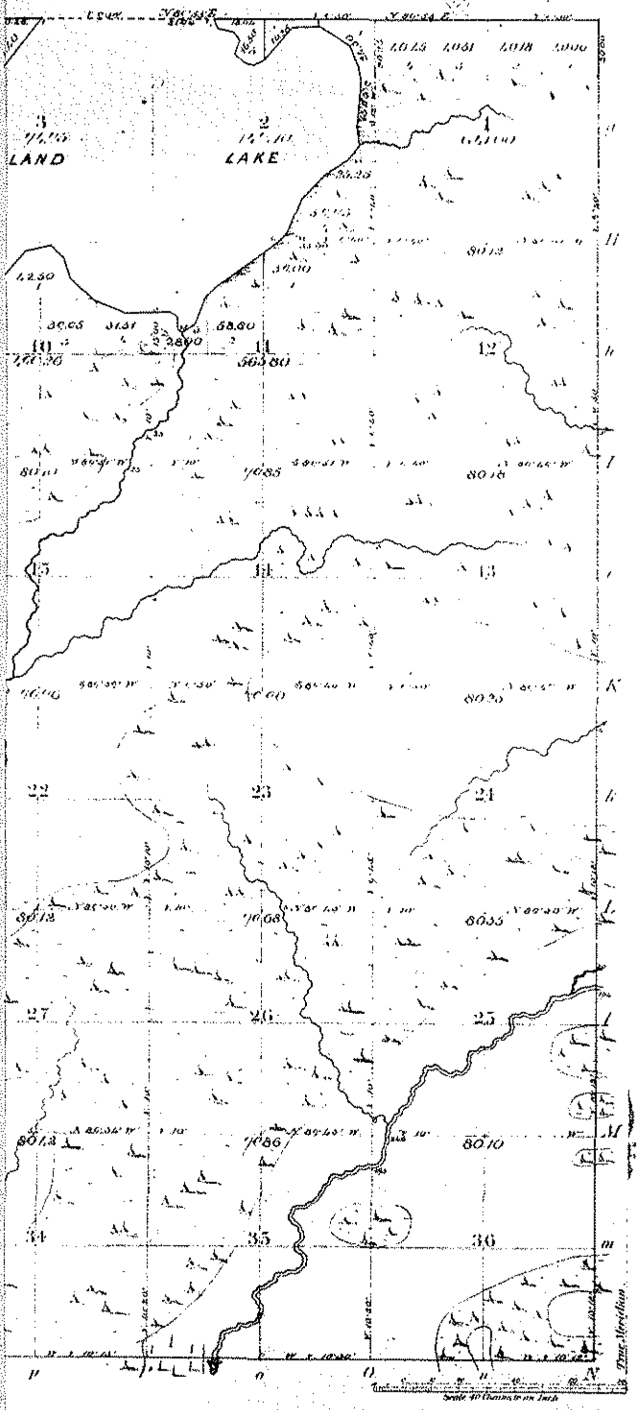


Figure 54. T.57N., R.17W., Minnesota. Cedar Island Lake — Original Plat.

4th Mer. Minnesota.



Meanders

CEDAR ISLAND LAKE.

Sec. Lines 2, 3, 4 & 10, 11

Sec. 3

S	88½°	W	24.00
S	65°	W	15.00
S	87°	W	15.00

Sec. 4

S	80°	W	10.00
S	67°	W	[illegible]
S	[illegible]	W	[illegible]
S	[illegible]	W	21.00
S	10	W	4.00
S	[illegible]	W	[illegible]
S	[illegible]	W	10.00
S	25°	W	12.00
S	15	E	18.00
S	27½	W	11.50
S	61½	E	6.10

Sec. 6

S	10½°	E	[illegible]
S	[illegible]	E	20.00
S	61	E	20.00
S	[illegible]	E	15.00
N	84½°	E	8.00
N	62½	E	15.15

Sec. 10

N	[illegible]	E	20.00
N	42°	E	27.00
N	75°	E	6.00
S	4°	E	6.20
S	19½	E	8.80
S	41°	E	12.00
S	68½	E	12.00
N	88°	E	8.70

Sec. 11

N	88°	E	6.25
S	00½	E	2.50
South			1.00
S	18°	E	2.00
N	58½	E	5.00
N	25°	E	10.00
N	44½	E	5.00
N	55°	E	27.00

Sec. 2

N	44½	E	5.00
N	22°	E	15.00
N	45°	E	12.00
N	50½	E	10.00
N	38°	E	6.00
N	[illegible]	W	7.00
N	42½	E	17.00
N	15°	W	5.00
N	22½	W	8.00
N	38°	W	15.00
S	87½	W	10.00
S	41°	W	15.00
S	66½	W	3.00
N	75°	W	2.50
N	52°	W	5.00
N	19½	E	5.00

N	[illegible]	W	[illegible]
N	70°	W	[illegible]
N	70	W	[illegible]

LAKE

Sec. 15

N	72°	E	4.00
N	41°	E	[illegible]
N	42½	E	8.00
S	67½	E	10.00
S	[illegible]	E	8.00
S	[illegible]	E	10.00
S	10	W	8.00
S	54	W	2.00
S	[illegible]	W	[illegible]
S	60	W	[illegible]
S	67	W	[illegible]
S	77	W	2.60

	Miles	chains	links
Total	8	50	50

The above Map of Township No 57 N of Range No 17 W of the 4th Principal Meridian Minnesota is strictly conformable to the field notes of the survey thereof on file in this Office which have been examined & approved.

Surveyor Generals Office,
St. Paul [illegible] 7th 18[illegible]

J. H. Baker
Sur. Genl.

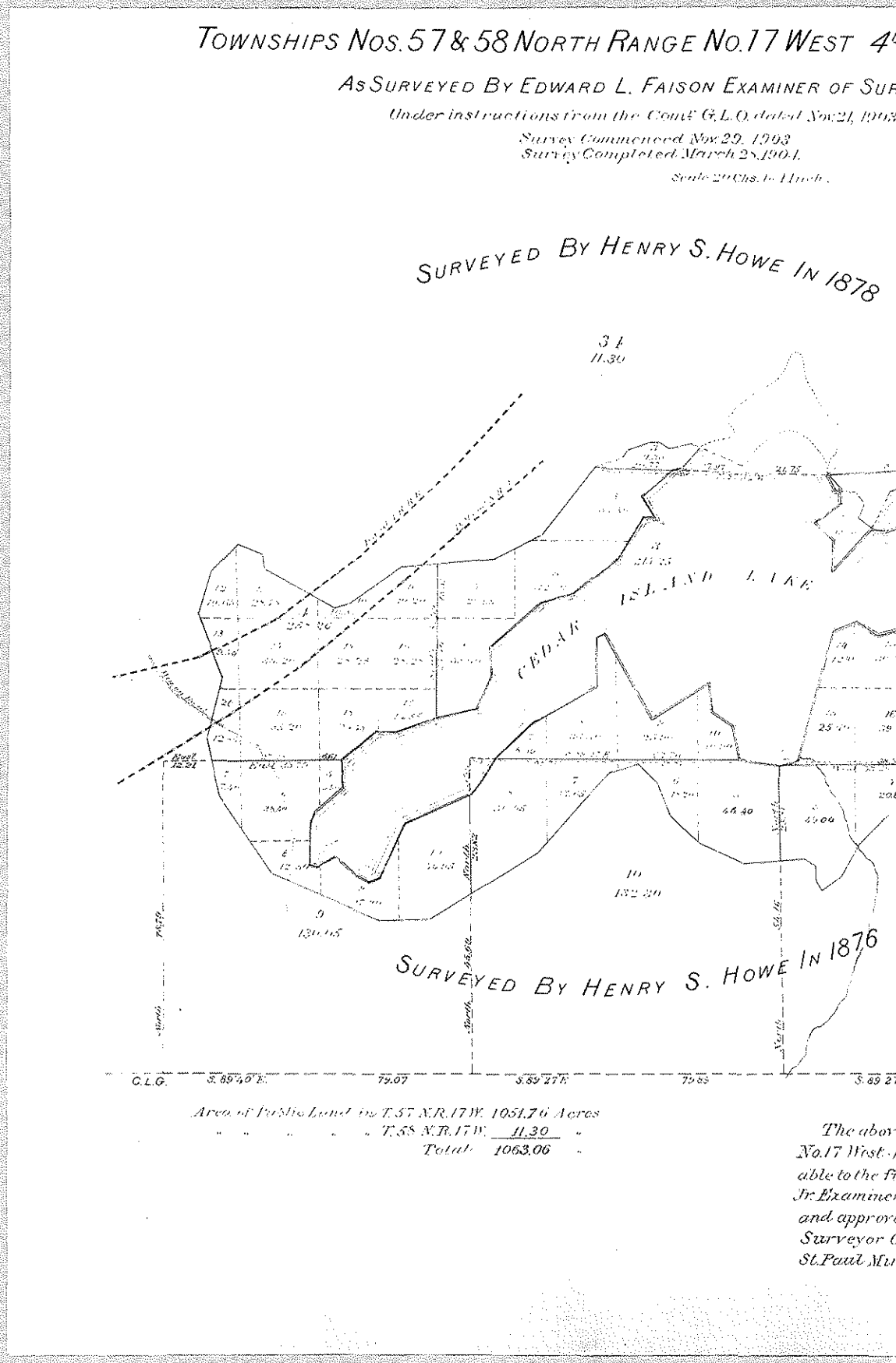


Figure 55. Cedar Island Lake — Omitted Lands Survey.

RANGE NO. 17 WEST 4th MER. MINNESOTA.

D L. FAISON EXAMINER OF SURVEYS.

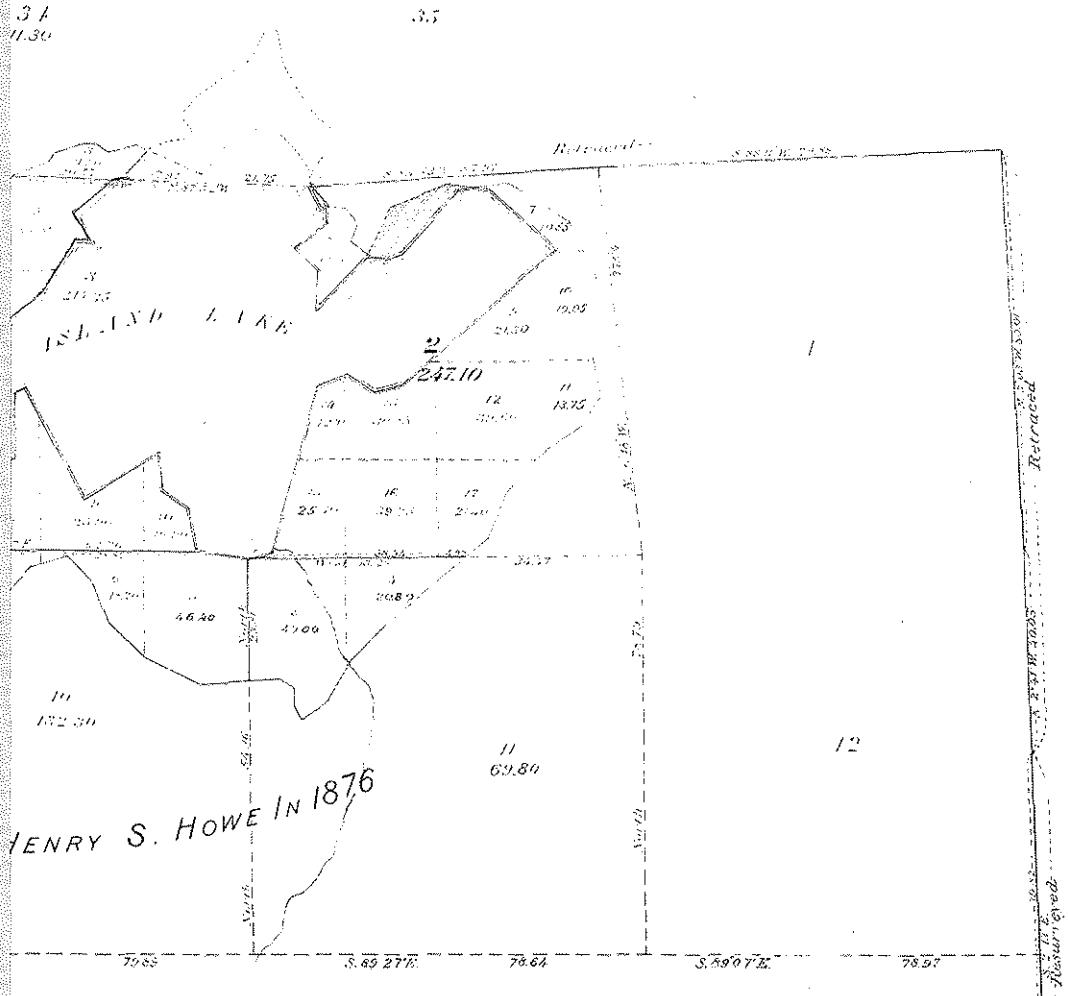
In the Cont' G.L.O. dated Nov. 21, 1903.

Commenced Nov. 29, 1903

Completed March 28, 1904.

Scale 20 Chs. to 1 Inch.

HENRY S. HOWE IN 1878



HENRY S. HOWE IN 1876

The above Map of part of Townships Nos. 57 and 58 North Range No. 17 West 4th Principal Meridian Minnesota is strictly conformable to the field notes of the survey thereof made by Edward L. Faison Jr. Examiner of Surveys on file in this Office which have been examined and approved.

Surveyor General's Office
St. Paul Minn. June 29th 1905

U.S. Surveyor General.

Posted Aug. 17/06 E.S.

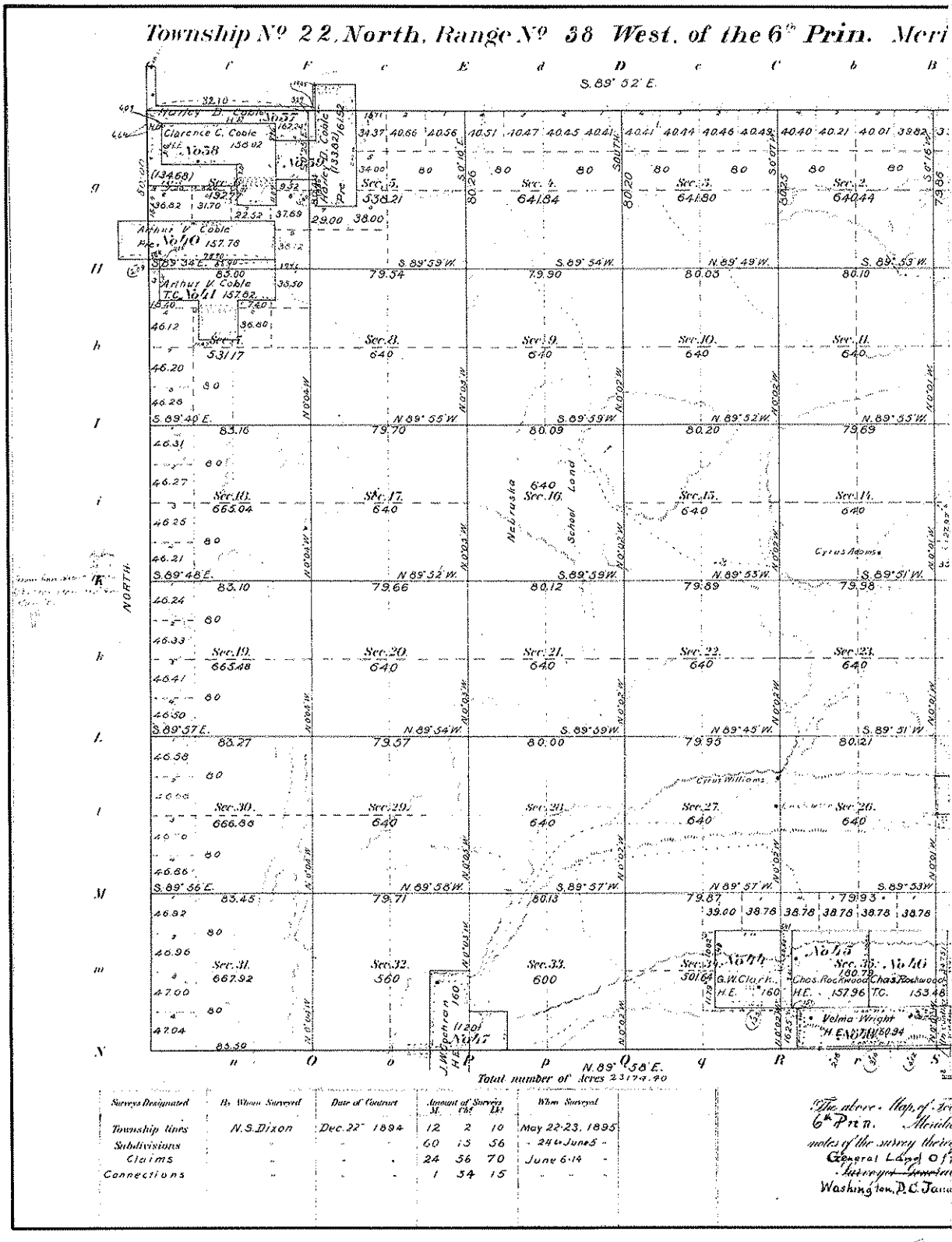


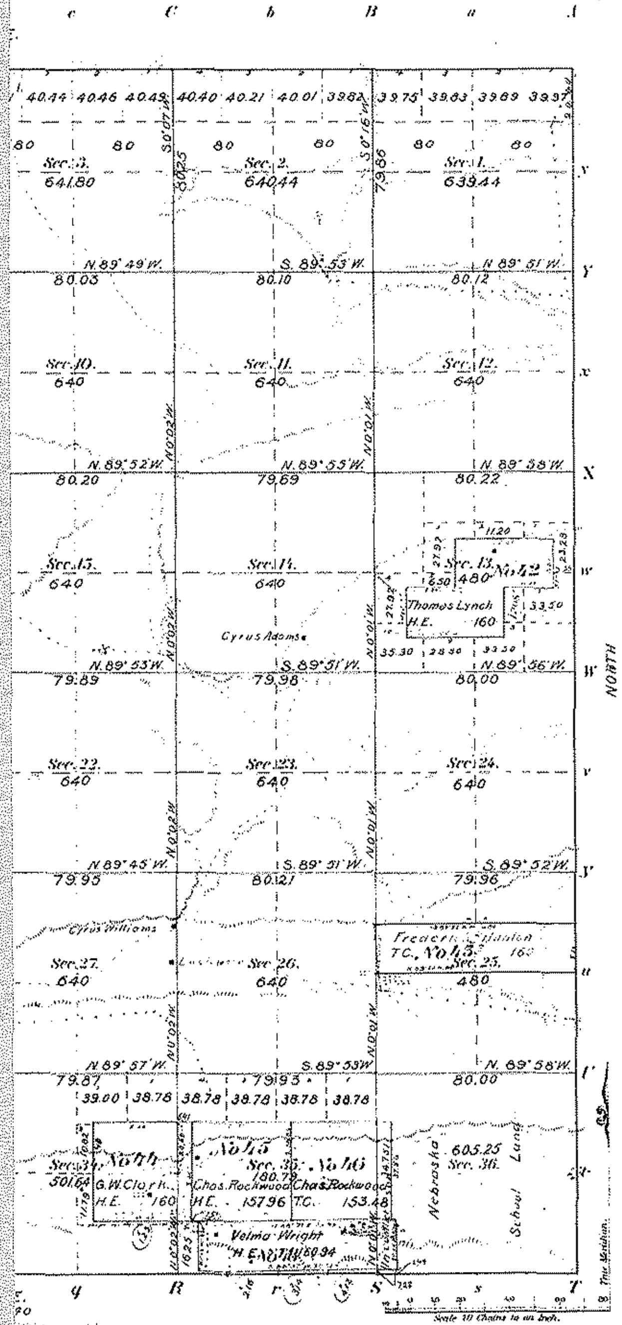
Figure 56. Grant and Hooker Counties, Nebraska. Independent Resurvey.

Report 483, Feb. 10, 1897.

...st. of the 6th Prin. Meridian

Recd. with letter from N. S. Dixon, D.S. dated July 11, 1896.

76036
1896.



Meanders of

Posts	Courses	Ch's Lk's	Posts	Courses	Ch's Lk's	Posts	Courses	Ch's Lk's

The above Map of Township No 22 N. of Range No 38 W. 6th Prin. Meridian Nebraska is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved.

General Land Office
~~Surveyor General's Office.~~
Washington, D.C. January 11, 1897.

[signature] Commissioner ~~Ex officio Sur. Genl.~~

Posted March 22, 1897
C. S. M.

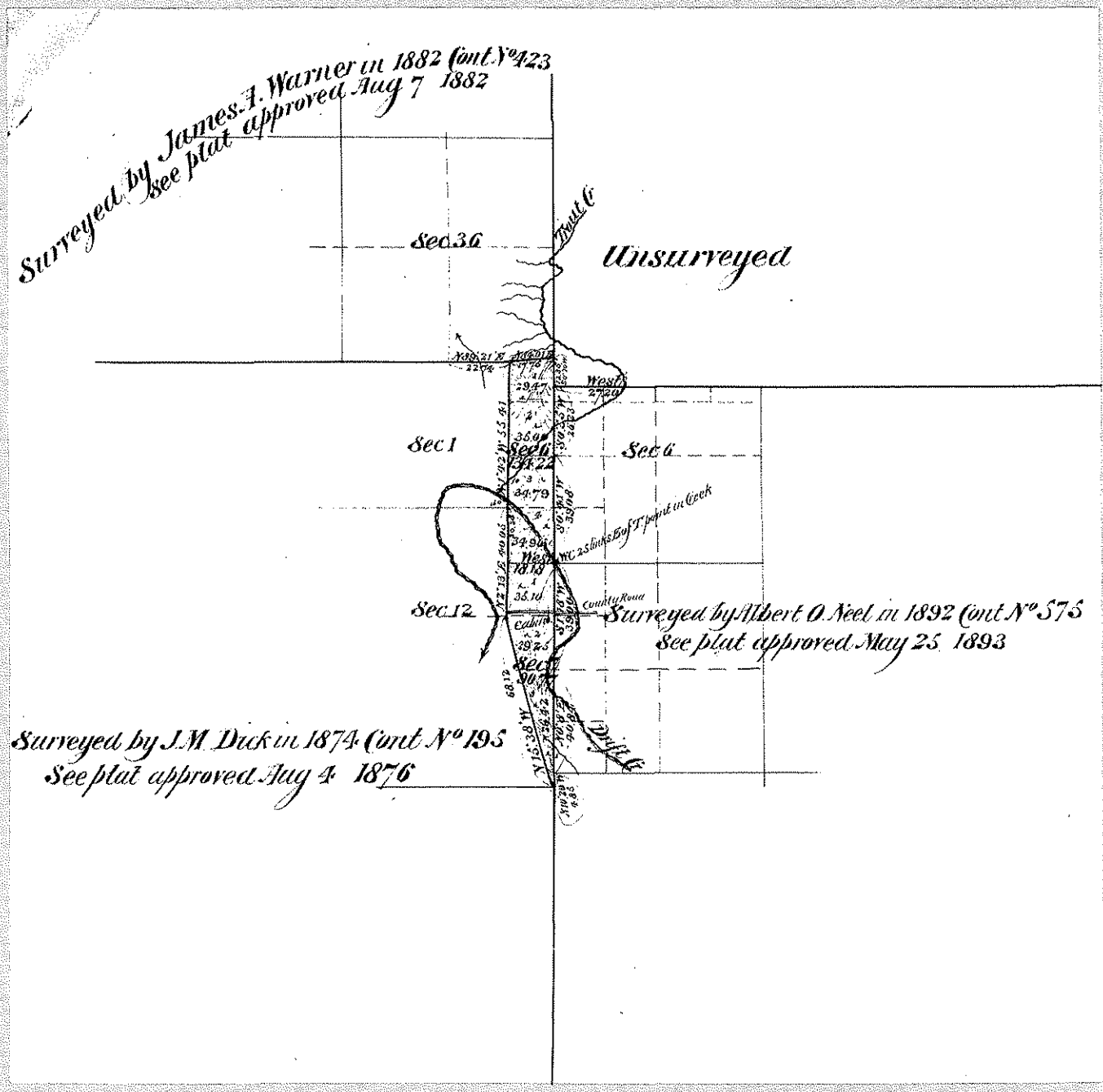


Figure 57. Hiatus T.13S., R.10½W., Willamette Meridian, Oregon. Approved July 14, 1899.

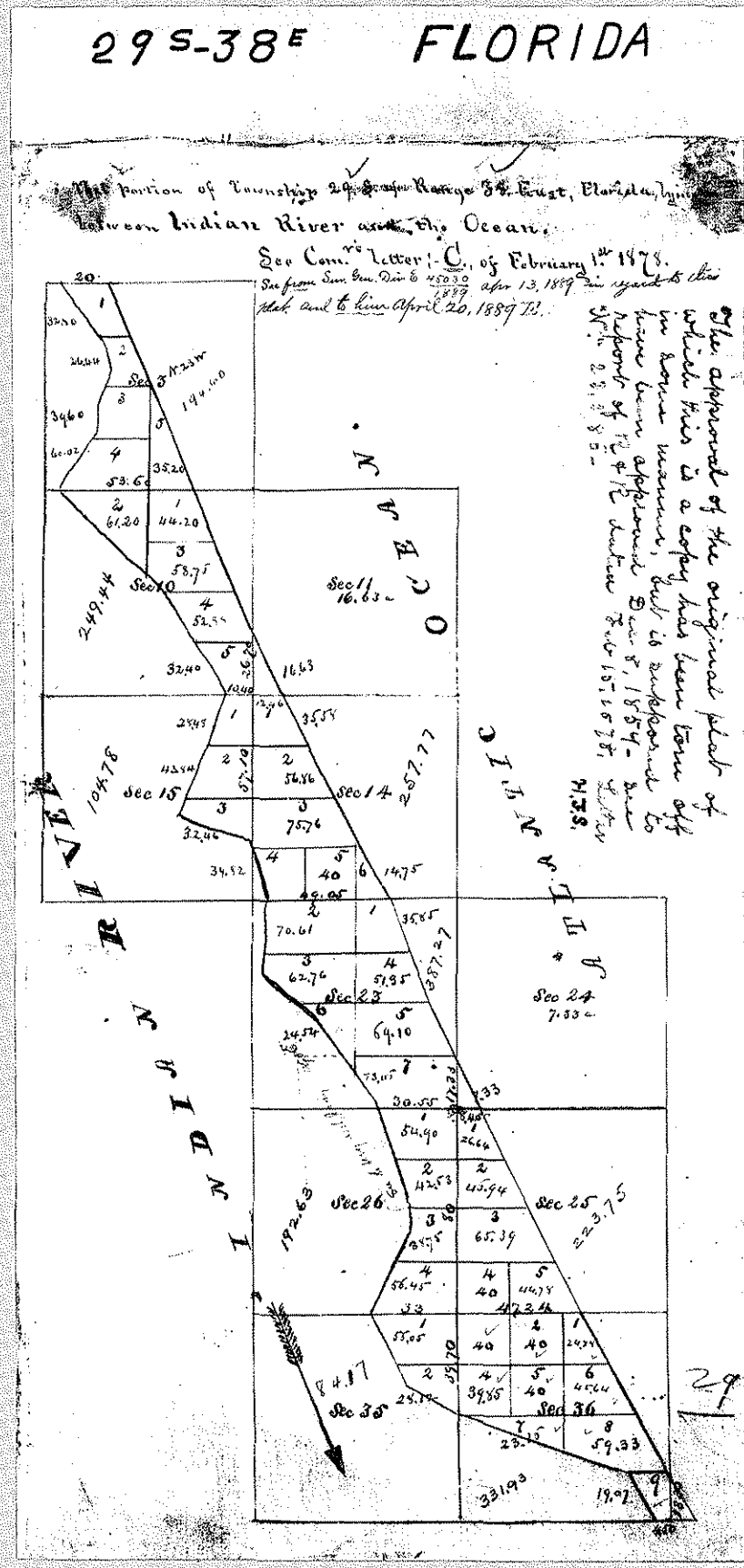


Figure 58. T.29S., R.38E., Tallahassee Meridian, Florida. Original Plat — December 8, 1859.

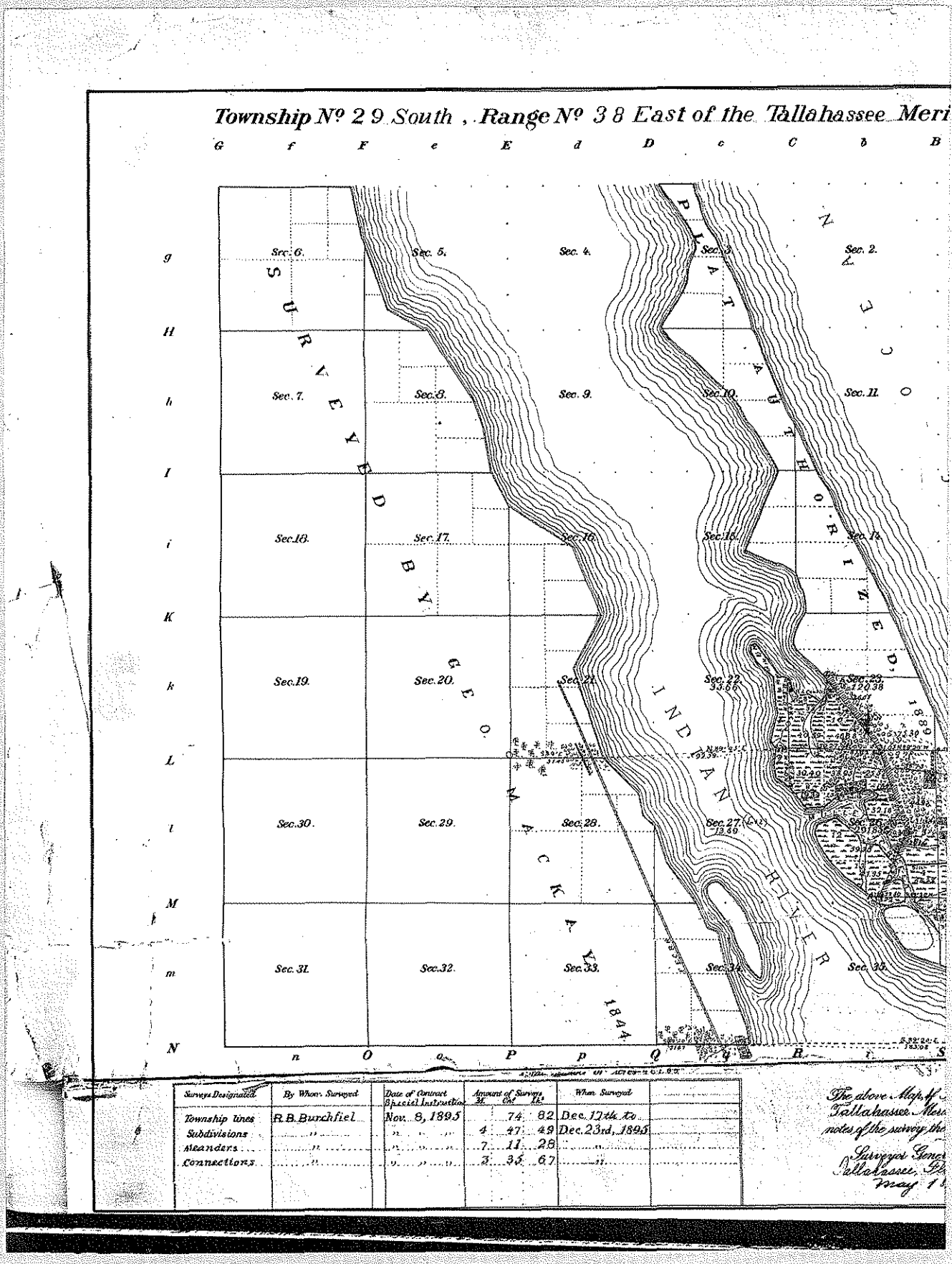
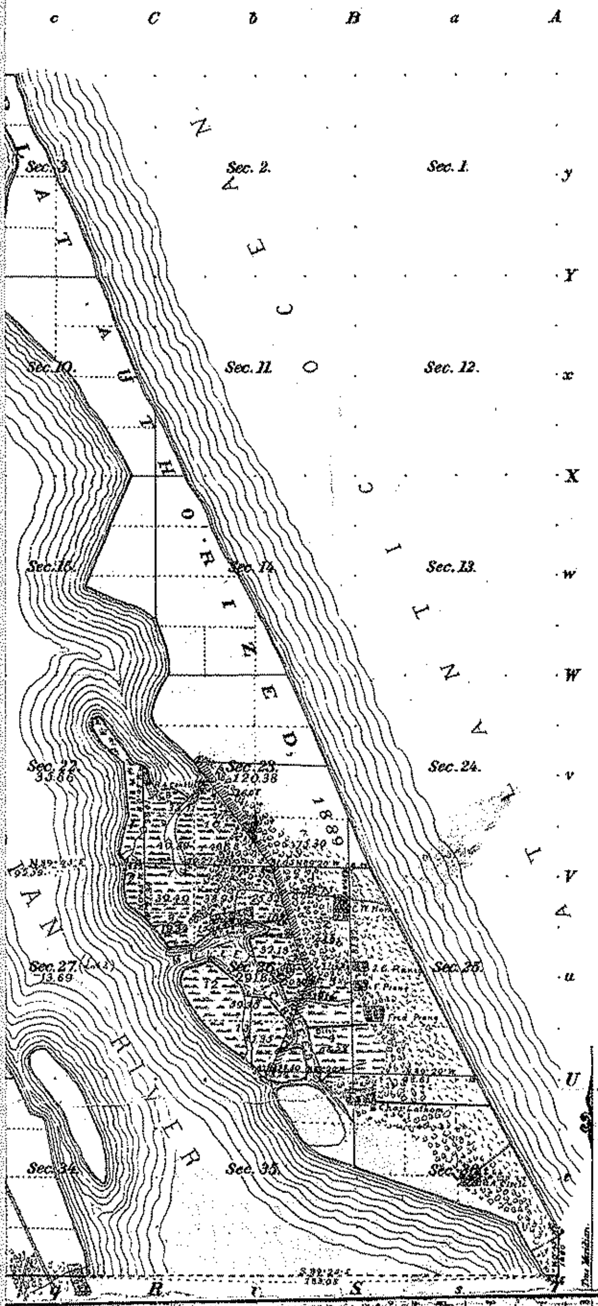


Figure 59. T.29S., R.38S., Florida Survey of Omitted Lands — 1896.

Report No. 207, June 1, 1896

of the Tallahassee Meridian, Florida.

RECEIVED WITH
... GEN'L'S. LETTER.
MAY 18 1896



Meanders of Indian River, Atlantic Ocean &c

Posts	Courses	Ch. Lk.	Posts	Courses	Ch. Lk.	Posts	Courses	Ch. Lk.
	In Sec. 22							
1	N. 31° W.	3.85						
	N. 3° E.	8.60						
	N. 15° 30' E.	8.70						
	N. 4° 30' W.	21.00						
4	N. 46° 15' W.	11.60						
	N. 29° 15' W.	6.00						
	N. 9° W.	2.10						
	N. 84° 30' E.	3.00						
	S. 35° 30' E.	18.00						
	S. 30° E.	5.00						
	S. 72° E.	4.04						
	In Sec. 23							
2	S. 75° E.	1.70						
	S. 19° 45' E.	5.00						
	S. 37° 30' E.	5.40						
2	N. 79° E.	5.80						
	S. 55° 15' E.	7.50						
	N. 43° 15' E.	11.17						
3	N. 35° 45' W.	8.05						
	In Sec. 27							
1	S. 8° 15' W.	10.30						
	S. 14° E.	6.00						
2	S. 52° E.	8.53						
	In Sec. 26							
4	S. 37° E.	13.60						
	N. 88° E.	10.00						
	N. 66° E.	8.50						
	N. 26° 15' E.	9.00						
	N. 79° 30' E.	9.00						
	S. 68° E.	6.40						
	S. 22° W.	2.80						
	S. 76° W.	7.70						
	S. 15° E.	7.70						
	S. 35° 15' E.	7.00						
	S. 50° E.	1.70						
	S. 21° 45' E.	6.60						
4	S. 49° 45' E.	4.85						
	S. 24° 55' W.	5.23						
	N. 39° W.	3.00						
	N. 42° 30' W.	9.60						
	N. 79° 30' W.	9.00						
	N. 23° W.	6.00						
	N. 27° 30' W.	7.20						
	N. 75° 45' W.	8.00						
	S. 70° W.	11.00						
	S. 19° W.	5.00						
	S. 15° 30' E.	6.00						
	S. 26° E.	4.60						
	S. 36° E.	5.40						
	S. 40° E.	14.00						
	S. 56° 30' E.	9.00						
5	S. 46° 30' E.	7.88						
6	N. 24° 55' E.	38.77						
7	N. 17° 50' W.	48.34						
	In Sec. 23							
8	N. 35° 45' W.	50.47						
3								
	In Sec. 36							
9	N. 27° 55' W.	71.43						
10								

The above Map of Township No. 29 South of Range No. 38 East of the Tallahassee Meridian, Florida, showing the [land between sixfield lines and ... of Sec. 22, 23, 26, 27, 34, of Sec. 26] is strictly conformable to the field notes of the survey thereof on file in this Office, which have been examined and approved.

Surveyor General's Office,
Tallahassee, Florida.
May 18, 1896

W. H. Milton Jr.
Surv. Genl.

Entered on Tract Book Aug. 4, 1896

Rs. 10 and 11 W., Willamette Meridian, in Oregon. Two separate range lines were monumented by surveys executed in 1874 and 1892. This is the first known hiatus actually surveyed, though several had been reported over the years with all being rejected. Gideon had some problems with this survey, designated T. 13 S., R. 10½ W. He finally completed it in March 1899 and the survey was approved July 14. The plat is shown in Fig. 57. Many hiatus surveys have been made since then.

On June 3, 1895, the Supreme Court rendered the final decision in the case of *Horne vs. Smith,* 159 U.S. 40. That case involved omitted lands along the Indian River in sections 23 and 26, T. 29 S., R. 38 E., in Florida.

On January 17, 1888, Commissioner Stockslager rejected the application by Charles A. and Robert T. Smith for the survey of a large body of land lying between the original meander line and the actual bank of the Indian River. The Commissioner thought they might be "accretions" or "swamp and overflowed" lands, and in either case would not be patentable to the Smiths, and on those grounds rejected their application. The Smiths actually occupied the land.

The "riparian" owner of the fractional lots in sections 23 and 26 was Charles W. Horne, who sued in an action of ejectment to kick the Smiths out and the case ended up in the Supreme Court. In the cited decision, the Court upheld the Smiths' claim that it was omitted land belonging to the government. The omitted area was 700 acres, while the fractional lots owned by Horne contained about 170 acres. Thus, a private suit proved government ownership.

On September 5, 1895, E. F. Best, Acting Commissioner, directed Surveyor General of Florida, William H. Milton, to have the lands surveyed. The survey was made by R. B. Burchfiel in December 1895, approved May 18, 1896, and accepted by the Commissioner on May 26, 1896. The original plat and omitted lands survey plat are shown in Figs. 58 and 59. This case solidified the government's stand on omitted lands and many have been executed over the past 80 years.

The *Act of February 20, 1896,* 29 Stat. 11, opened certain Forest Reserves in Colorado to mining claim entry. Subsequent acts of Congress have opened nearly all the forest lands to valid mining claims.

The Indian Department *Appropriations Act of June 10, 1896,* 29 Stat. 321, appropriated $200,000 for continuation of the rectangular surveys in the Indian Territory of Oklahoma. The act also provided for prosecution and fine of any person convicted of destroying or defacing survey monuments or trees marking a survey. The provision for a $250 fine for destroying survey corners and bearing trees were enacted into statutory law in 1909.

The *Civil Appropriations Act of June 11, 1896,* 29 Stat. 413, 435, stipulated that the USGS was to establish at least two bench marks in each township west of the One Hundred and Third Meridian and that they should be established near the township corners if practicable and monumented with iron posts or stones.

On October 16, 1896, the first full Circular titled *Restoration of Lost or Obliterated Corners and Subdivision of Sections* was issued. It combined all previous circulars covering the same subjects and has been reissued periodically ever since in that format.

The *Act of February 11, 1897,* 29 Stat. 526, permitted the patenting of oil lands under the placer claim provisions of the mining law.

Binger Hermann from Oregon was appointed Commissioner of the GLO on March 25, 1897. On May 26, 1897, Hermann issued a Circular letter to all Surveyors General. In the future, plats would be made of all township exteriors, standard parallels, and guide meridians when surveyed. The old practice was to show them along with the township subdivisions when those were surveyed.

The *Civil Appropriations Act of June 4, 1897,* 30 Stat. 11, 34-36, is also known as the *Forest Reserve Act of 1897.* It is long and complex; among other items, it provided for the survey of the Forest Reserve boundaries, township and subdivisional lines by the USGS, and the protection of the reserves by the Secretary of the Interior.

The surveyors employed by the USGS were government employees under the Civil Service system, established in 1883 (22 Stat. 403). The GLO had gained a bad reputation for surveying due to the Benson Syndicate Scandals and the timber land frauds. It was thought that government employees could and would do an honest job of surveying the valuable timber lands in the Forest Reserves. The law required them to make the rectangular surveys in compliance with the existing laws and regulations, i.e., the *Manual of Surveying Instructions.* The plats and field notes were approved by the Commissioner of the GLO. It might be said that these rectangular surveys in the Forest Reserves were the origin of the direct system of surveying. In 1898, in the Black Hills Reserve, surveys were being made by Frank M. Johnson, A. L. Coleman, M. P. McCoy, William H. Thorn, and J. Scott Harrison, all employees of the USGS. Frank M. Johnson became the first Supervisor of Surveys when the direct system began in 1910. In 1900, Johnson was a Special Examiner of Surveys in Colorado. The rectangular surveys of the townships were generally well executed. However, the survey of the Forest Reserve boundaries were usually monumented with three-inch iron posts. In some places (California), the USGS surveyors did not execute the boundary work correctly, ignored the original surveys, or followed some other incorrect procedure. In those cases, the surveys were never approved or accepted by the GLO. Monuments may exist on the ground but have no legal force or effect except as they indicate the position of the original approved surveys.

The survey of townships adjacent to the boundaries of the Forest Reserves by the USGS continued until 1899. After that, they surveyed only the boundaries of the reserves, continuing until 1905.

Under the protection provisions of the *Forest Reserve Act,* Binger Hermann reorganized "Division P" of the GLO into a Division of Forestry; it became "Division "R" on March 1, 1901. Five years later in 1903, the Division of Forestry employed 326 Forest Rangers, 41 Forest Supervisors, and 6 Forest Superintendents; the most notable was Gifford Pinchot, Special Forest Agent. These men managed and protected the forest reserves and watersheds and supervised timber sales. All were government employees, appointed in accordance with the *Act of July 7, 1898,* 30 Stat. 673.

On June 29, 1897, a Circular letter to the Surveyors General directed them that in the future, bearing trees at all quarter-section corners would be marked with the section number

included, such as ¼ S 16 BT, not just ¼ S BT as in the old practice.

The *Act of July 24, 1897,* 30 Stat. 215, provided for the appointment of a Surveyor General in the District of Alaska; William L. Distin was appointed and established his office at Sitka, November 5, 1897. Distin moved the office to Juneau in the fall of 1906 where it remained until abolished.

The *Act of April 29, 1898,* 30 Stat. 367, is known as the "Arkansas Compromise Act." Arkansas relinquished her claim to all of the remaining unclaimed swamp lands in that State.

The *Act of May 14, 1898,* 30 Stat. 409, extended the homestead law to Alaska but restricted the claims to 80 rods along navigable waters, with a shore space of 80 rods between claims; granted right-of-way to railroads; defined navigable waters and tidelands; and provided for 80-acre trade and manufacturing sites.

The following item was reported by the Surveyor General of North Dakota in his *1898 Annual Report:*

> "August 8, 1898, at 7.30 p.m., fire broke out in the Northern Pacific Railway Company's freight house, and, owing to the character of the building and the wind prevailing at the time, the fire was beyond control in a very few minutes, and spread rapidly to the main business portion of the city. This office was situated on the third floor of the First National Bank building, and it was impossible to save but a small portion of the records."

Williams then went on to list the few records saved. Once again the Washington copies were called on to replace the burned records at considerable expense.

The *Civil Appropriations Act of March 3, 1899,* 30 Stat. 1074, restricted the USGS surveys in the Forest Reserves to the survey of the boundaries of those reserves. The survey of all regular township and section line surveys within the reserves was returned to the GLO. The act also provided for metes and bounds Homestead Entry Surveys (HES) in the Black Hills Reserve in South Dakota on lands classified as agricultural, a departure from the rectangular system. Actually, settlers had been taking up homesteads in the Black Hills under the *Placer Mining Law.*

By this act, the rectangular system of surveys was extended to the District of Alaska; none were made until 1905.

The *Act of June 6, 1900,* 31 Stat. 327, extended the mining laws of the United States to Alaska.

On January 1, 1902, the *Manual of Surveying Instructions, 1902,* was officially issued and was made part of all surveying contracts by the *Act of April 26, 1902,* 32 Stat. 120.

The *Act of June 17, 1902,* 32 Stat. 388, provided for the reclamation and irrigation of arid lands in the West. Under this act and amendments which followed, the Bureau of Reclamation was established in the Department of the Interior; eventually, it would execute some rectangular surveys and resurveys on lands under their authority. The first employees of the Reclamation Service were men from the hydrographic branch of the Geological Survey.

The *Act of July 1, 1902,* 32 Stat. 728 and *January 10, 1903,* 32 Stat. 767, authorized the resurvey of 25 townships in San Diego County, California, and 84 townships in Wyoming without requiring a petition by the settlers. Up to this time the Congress had provided funds for resurveys in most of the appropriations acts. These resurveys were usually at the request of settlers who couldn't find the corners. Congress was generally moving toward the necessary legislation allowing resurveys. The resurveys provided for, when executed, were done almost as original surveys and caused much contention.

On January 26, 1903, Binger Hermann was removed from office and William A. Richards was appointed Commissioner of the GLO. Hermann was involved in timber land frauds in the West and it was alleged that he burned 43 letter books of correspondence before he left office; he was later elected Congressman from Oregon. On February 13, 1905, Hermann, Senator Mitchell from Oregon, and several other men were indicated on charges of land frauds involving 150,000 acres of timber lands in the Blue Mountain Forest Reserve in Oregon.

The *Act of March 3, 1903,* 32 Stat. 1028, enlarged homesteads in Alaska to 320 acres to be surveyed in a rectangular form if no rectangular system surveys existed near the homestead. There were no rectangular surveys at that time in Alaska.

The *Act of February 1, 1905,* 33 Stat. 628, transferred the Forest Reserves to the Department of Agriculture and established the bureau known as the Forest Service within that department. Thus, the GLO was the origin of the USGS, Bureau of Reclamation, and the Forest Service.

The *Act of April 16, 1906,* 34 Stat. 116, provided for Reclamation Townsites on lands administered by that Bureau.

On April 17, 1905, Alfred B. Lewis, Deputy Surveyor, under Contract No. 3 with the Surveyor General of Alaska, William L. Distin, set a stone monument on the north side of Stuck Mountain for the initial point of the Copper River Meridian. The point was near the Military Trail and telegraph lines which later became the Richardson Highway. Lewis then surveyed some 72 miles of the Copper River Meridian, 18 miles of the baseline, and the exterior boundaries of several townships. These surveys were approved by Distin on January 28, 1908, and the rectangular surveys were underway in Alaska. The first township subdivided in Alaska was T. 3 N., R. 1 W., Copper River Meridian, around the community of Copper Center in the Copper River Valley. That survey was made by Thomas A. Haigh, Deputy Surveyor, in 1910. The returns were approved by Distin on April 11, 1912. These surveys were hard to contract for at the low prices allowed by law.

At 5:16 a.m., April 18, 1906, the great San Francisco earthquake hit that city, with a subsequent fire that burned for days. The Surveyor General's office and all his records, plats, maps, etc. were destroyed. The rectangular plats and field notes were once again replaced over several years from the Washington copies. Many of the mineral survey records were, however, destroyed forever. There were thousands of claims and most of their records were recovered through the claimants and land offices but, California still suffers many difficulties with mining claims because of the loss. The San Francisco fire was the last of the series, beginning with Symmes in Ohio. The GLO (and BLM) have never provided safe, fireproof storage for these vital records where the reliability of an original document versus a copy is so important. Ironically, many of the "Washington copies" are now

housed in a flammable wooden structure in Denver, Colorado.

The *Act of April 28, 1904,* 33 Stat. 545, declared the corners of mineral surveys the best evidence of the true position of a mining claim. In other words, the mineral survey corners assumed the same legal status as the rectangular survey corners, they were unchangeable, and the Surveyor General had to honor them.

The *Act of May 17, 1906,* 34 Stat. 267, enabled Oklahoma, Arizona and New Mexico to become States. Oklahoma formed a government and was admitted to the Union on November 16, 1907.

The *Act of June 11, 1906,* 34 Stat. 233, provided for Homestead Entry Surveys on agricultural lands within most of the Forest Reserves. The previous act had applied only to the Black Hills. Under this act the lands classified by the Forest Service as best suited for agriculture were surveyed by metes and bounds. These surveys were made by Forest Service surveyors under instructions from the Surveyors General and were approved by and filed in the GLO in about the same manner as any other survey. Homesteads in the Black Hills Reserve were denied riparian rights under an unusual provision, Sec. 3 of the act. This act was repealed *October 23, 1962,* 76 Stat. 1157.

On January 28, 1907, Richard A. Ballinger was appointed Commissioner of the GLO.

The *Act of March 2, 1907,* 34 Stat. 1232, directed the Surveyor General of Alaska to furnish survey numbers to the land offices at Nome and Fairbanks. The numbers were those used in the official surveys known as the "U.S. Surveys" of metes and bounds claims in that State.

On January 14, 1908, Fred Dennett was appointed Commissioner of the GLO and took charge in March. Ballinger became Secretary of the Interior.

The *Civil Appropriations Act of May 27, 1908,* 35 Stat. 317, provided $25,000 for the purchase of iron posts to be used to monument the corners of the public land surveys. Iron posts have been the standard monument ever since. The act also abolished the offices of Surveyor General in Minnesota, North Dakota, and Florida. Rates of up to $25 per mile were allowed in the land surveys at that time.

The *Act of March 3, 1909,* 35 Stat. 845, is the "Resurvey Law." It provides by statute for the necessary resurveys of the public lands and is codified in 43 U.S.C. 772. Resurveys had been made for many years but this act authorized them whenever and wherever they were necessary to mark the boundaries of the remaining public lands.

The *Civil Appropriations Act of March 4, 1909,* 35 Stat. 945, abolished the Office of Surveyor General in Louisiana.

The *Act of June 20, 1910,* 36 Stat. 557, again enabled Arizona and New Mexico to become States. New Mexico was admitted January 6, 1912, and Arizona on February 14, 1912. Both States received sections 2, 16, 32, and 36 in each township for school lands. The 48 contiguous States were completed.

The *Civil Appropriations Act of June 25, 1910,* 36 Stat. 703, provided that, "The surveys and resurveys to be made by such competent surveyors as the Secretary of the Interior may select, at such compensation not exceeding two hundred dollars per month as he may prescribe. . . " It was the end of the contract system of surveys begun by Rufus Putnam in 1797. The system had surveyed millions of acres of public lands by good, bad and indifferent surveyors. Most of the easy surveying had been done, so not even the Deputy Surveyors themselves were sorry to see the contract method go.