OBSERVATIONS AND CALCULATIONS AND FIELD NOTES OF THE ESTABLISHMENT OF THE POINT OF INTERSECTION OF THE TRUE 100TH MERIDIAN WITH THE RED RIVER; 57TH CONGRESS, 2D SESSION. HOUSE OF REPRESENTATIVES. DOCUMENT NO. 375

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Observations and Calculations and Field Notes of the Establishment of the Point of Intersection of the True 100th Meridian With the Red River; 57th Congress, 2d Session. House of Representatives. Document No. 375 by Arthur D. Kidder

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ARTHUR D. KIDDER

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57TH CONGRESS, 2d Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 375.

OBSERVATIONS AND CALCULATIONS

AND

FIELD NOTES

OF

THE ESTABLISHMENT OF THE POINT OF INTERSECTION OF THE TRUE 100TH MERIDIAN WITH THE RED RIVER.

UNDER THE PROVISIONS OF THE ACT OF JANUARY 15, 1901 (31 STATS., 731).

ARTHUR D. KIDDER,

Examiner of Surveys, General Land Office.

U. S. — A

DETERMINATION COMMENCED FEBRUARY 13, 1902.

DETERMINATION COMPLETED APRIL 16, 1902.

FEBRUARY 10, 1903.—Referred to the Committee on the Public Lands and ordered to be printed.

WASHINGTON:

GOVERNMENT PRINTING OFFICE.

1903.

LETTERS OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
Washington, D. C., February 5, 1903.

SIR: Respectfully referring to your letter dated May 31, 1901, detailing Arthur D. Kidder, examiner of surveys, to make the necessary observations and calculations and to establish the point of intersection of the true one hundredth meridian with the Red River, under the provisions of the act of Congress approved January 15, 1901 (31 Stats., 731), I have the honor to report that by letter dated January 24, 1903, Mr. Kidder transmitted to this office the complete field notes, in duplicate, of said determination. The said field notes of the observations and calculations for the establishment of the point of intersection of the true one hundredth meridian with the Red River having been examined, it appears that Mr. Kidder has fulfilled the requirements of his instructions from this office, dated February 4, 1902, and the said field notes and the determination they describe have therefore been approved on this date.

* * * * * * *

I transmit herewith the duplicate copy of said field notes of the establishment of the point of intersection of the true one hundredth meridian with the Red River, in temporary binding, duly approved by this office, for such action as you may desire to take in the matter.

Very respectfully,

W. A. RICHARDS, *Commissioner.*

The honorable SECRETARY OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
Washington, February 9, 1903.

SIR: The first section of the act of Congress approved January 15, 1901 (31 Stats., 731), provides as follows:

> That the Secretary of the Interior be, and he is hereby, authorized and directed to cause to be established and fixed the intersection of the true one hundredth meridian with Red River, or what, prior to said decision, was known some time as the South Fork of Red River, or Prairie Dog Town Fork, by the most accurate and scientific methods, and at said intersection cause a suitable monument to be erected on the ground.

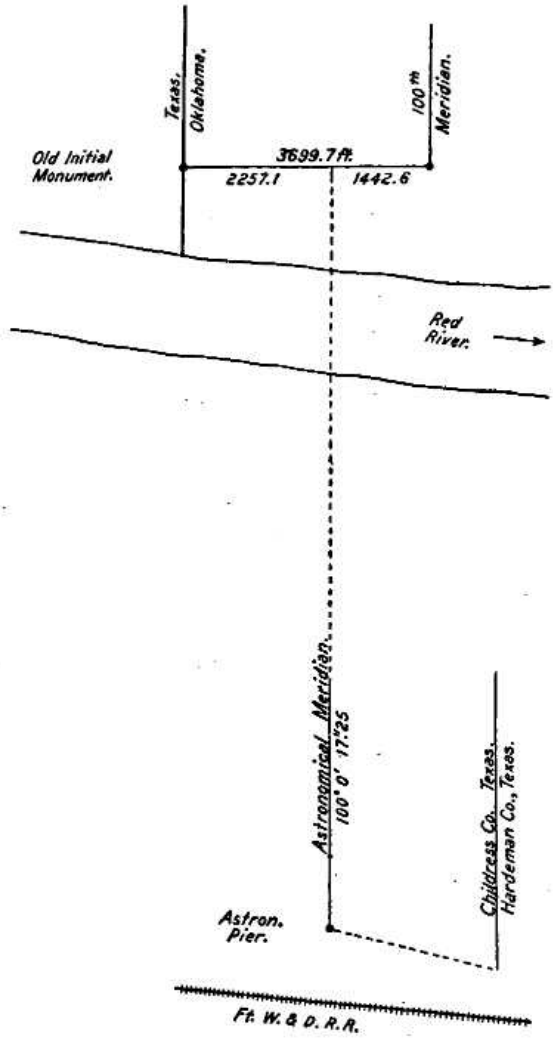
On December 1, 1902, in compliance with the direction thus given, I reported to you that I had caused a determination of the intersection of the true one hundredth meridian with Red River, and the establishment of a permanent monument to mark such intersection, and transmitted with the report a copy of the preliminary report of Arthur D. Kidder, examiner of surveys, who performed the work.

I now have the honor to transmit herewith, as a final report, and for the information of the Congress, a copy of the observations, calculations, and field notes of the establishment of the point of intersection of the true one hundredth meridian with the Red River, by Arthur D. Kidder, examiner of surveys, General Land Office, and a copy of so much of the letter of the 5th instant, from the Commissioner of the General Land Office, as relates to the subject.

Very respectfully,

E. A. HITCHCOCK,
Secretary.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.


Texas.
Oklahoma.
100th Meridian.
Old Initial Monument.
3699.7 ft.
2257.1
1442.6
Red River.
Astronomical Meridian.
100° 0' 17".25
Childress Co., Texas.
Hardeman Co., Texas.
Astron. Pier.
Ft. W. & D. R. R.

ESTABLISHMENT OF THE POINT OF INTERSECTION OF THE TRUE ONE HUNDREDTH MERIDIAN WITH THE RED RIVER.

ASSISTANTS.

AUGUSTUS MACCONNEL,
United States Astronomer, Elmira, N. Y., Assistant Astronomer.

C. N. MCNEILL,
Superintendent of the Western Union Time Service, St. Louis, Mo., Telegrapher, St. Louis, Mo.

F. W. WESSEL,
Western Union Telegraph Company, Denver, Colo., Telegrapher, Red River Observatory.

THE RED RIVER OBSERVATORY.

February 13, 1902, I found the old initial monument of the Texas and Oklahoma boundary, on the crest of the hill that rises to the north from the left bank of the South Fork of the Red River; this monument is—

A combination of gypsum-sandstone 5 by 12 by 18 inches above ground, set in a small mound of stone; marked 100 W on east face, and I M on west face; established by A. H. Jones and H. M. C. Brown, United States surveyors, in 1859, under their contract with the Commissioner of Indian Affairs, dated October 13, 1857.

Latitude, 34° 34′ 43″.4; longitude, 100° 00′ 45″.41 (preliminary assumption). Values as determined by Prof. Henry S. Pritchett in 1892, and assumed by me in preliminary work. (See printed records in the Supreme Court of the United States in the case involving title to Greer County, Tex., now Greer County, Okla.)

From the initial monument I projected a random meridian south across Red River to an intersection with the Fort Worth and Denver Railroad, about 14 miles distant, where arrangement was made to connect with the wires of the Western Union Telegraph Company.

In the projection of the random meridian, I used transit No. 7058 made by Young & Sons, and equipped with the Smith solar attachment. A solar meridian was determined at every instrument point.

The point of intersection being unfavorable for astronomical observations, a point for the Red River observatory was chosen on a small hill about a quarter of a mile north of the railroad and a little less than half of a mile east of the projected meridian. At this assumed point a concrete pier was built for the meridian telescope, and a small shed opening in the meridian was constructed to protect the instruments.

February 16, 1902, at apparent noon, at the astronomical pier, I set 12° 26′ S. on the decl. arc of the solar and observe the sun on the meridian; the resulting latitude being = 34° 23′ N., which is the value

used in the following observations and calculations. (No requirement in the longitude determination calling for a more precise determination of the latitude of the place of observation.)

February 16, 1902, at $2^h\ 0^m$ p. m. App. T., at the astronomical pier I set 34° 23′ N. on the lat. arc of the solar, 12° 24′ S. on the decl. arc, and determine the meridian in azimuth, which I mark upon the ground for preliminary work.

From the astronomical pier a sandstone 10 by 12 by 18 inches above ground, marked C. C. on west face and H. C. on east face, bears S. 77° 24′ E. 39.54 chains distant; this stone is on the meridian county line between Childress and Hardeman counties, Tex., and lies a few hundred feet north of the Fort Worth and Denver Railroad, the Red River observatory being in Childress County, Tex.

The observatory was established February 18, 1902. The equipment consisted of a Wurdemann meridian telescope, object glass 2¼ inches, focal length 24 inches; a Saegmuller chronograph, and a Bond & Son's sidereal break-circuit chronometer No. 568, property of the General Land Office, and a full set of telegraphic instruments, property of the Western Union Telegraph Company.

THE LEVELS.

The meridian telescope is provided with two striding levels:

(1) "Old level," zero at the center of the tube, to be used with a bubble approximately 80 divisions long, the value of 1 division of which I determined on a Saegmuller "level-trier" to be, $d=0''.08$, as follows:

Tabulated trials.

No.	Levels. E.	Levels. W.	Mean difference.	Arc of screw.	Value one division.
				"	"
1	66.0 18.0	17.0 65.0	48.0	60	1.250
2	69.4 25.6	15.6 59.4	43.8	50	1.141
3	27.0 63.5	56.8 20.3	36.5	40	1.097
4	69.8 35.5	32.3 66.5	34.25	40	1.168
5	56.2 24.0	24.3 56.5	32.2	40	1.243
6	56.0 24.0	22.0 54.0	32.0	40	1.250
7	32.0 58.0	70.8 44.8	26.0	30	1.154
8	55.5 30.8	23.5 48.0	24.6	30	1.220
9	30.0 49.8	48.0 28.4	19.7	25	1.269
10	57.5 70.4	44.8 32.2	12.75	15	1.177
11	36.8 49.1	41.3 23.8	12.4	15	1.210
			Mean.....	.....	1.198
			1/15	..... $d=$	0".0799 0".08